PENN STATE GEOSCIENCES

A HISTORY OF THE DEPARTMENT

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Deike Building at the Penn State University Park Campus, home to the Department of Geosciences

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PREFACE

In 1988 the Department of Geosciences celebrated its 75th anniversary and the occasion was marked by a history of the Earth Sciences at Penn State written by Benjamin F. Howell, Professor Emeritus of Geophysics (Howell 1988), and by two anecdotal accounts of Professors Emeritus T. F. Bates dealing with the 1940s and E. F. Osborn on the history of the Deike Building. The combined document was called "A History of the Geosciences at Penn State on the Occasion of the 75th Anniversary of the Department of Geosciences" (Appendix I). More than three decades have passed since that retrospective and during that time the Earth Sciences have experienced a revolution in focus and breadth. How the Penn State Department of Geosciences responded to, and in fact led that revolution, is summarized here.

IN THE BEGINNING—A SUMMARY OF THE FIRST 75 YEARS

As Ben Howell pointed out (Howell 1988) geology and mineralogy have been taught at Penn State since at least 1861, and a Department of Geology and Zoology was established in 1882. But it was really the establishment of a new program in Mining Engineering in 1893 and a School of Natural Sciences in 1896 that created Penn State's first Department of Geology. Why 1913 is taken as the founding of the department rather than 1896 is unknown. By 1921 we were a Department of Geology and Mineralogy (with one professor each) within the School of Mines; by 1933 we were the Department of Geology, Mineralogy, and Geography within a School of Mines and Metallurgy. In 1941 we renamed ourselves the Department of Earth Sciences which included faculty in geology, mineralogy, geography, and meteorology. In 1946 the department again reorganized, becoming the Division of Earth Sciences with its former divisions now departments: Geology (with F. M. Swartz as Head), Mineralogy (P. D. Krynine), Geography (E. W. Miller), Geophysics (S.J.G. Pirson), and Meteorology (H. D. Neuberger). The logic of these groupings isn't immediately obvious, although separating intractable personalities seems to have been involved (Howell 1988). When the Pennsylvania State College became a university in 1953, Schools became Colleges, and the former Division of Earth Sciences was reorganized into four departments. Ten years later this multi-decadal trend of speciation reversed. Nineteen sixty-three saw geology and geophysics combined into one department and geochemistry and mineralogy into another. These two departments, along with geography and meteorology, still made up a Division of Earth Sciences within the College of Earth and Mineral Sciences, but not for long. In 1971 the Division of Earth Sciences was abolished, and the departments of geology and geophysics and mineralogy and geochemistry were combined into a Department of Geosciences, although with three

separate sections—Geology with R. F. Schmalz as chairman, Geochemistry with A. L. Boettcher as chairman, and Geophysics with S. S. Alexander as chairman, each running its own graduate program. In 1975 the program chairmen were D. M. Kerrick (Geochemistry and Mineralogy), D. P. Gold (Geology), and S. S. Alexander (Geophysics). With the opening of Walker Building in 1977, Meteorology and Geography vacated Deike Building, and the three Geosciences graduate programs immediately stratified by floor, with geochemistry on second, geology on third, geophysics on fourth, and the department office and communal space on fifth. Apparently, the graduate faculties were still immiscible. Dr. Arnulf Muan, best known for his phase equilibrium diagrams in oxide systems, was the first Geosciences Department Head. Four years later he was succeeded by Dr. C. Wayne Burnham, after whom the lead calcium silicate, wayneburnhamite is named. Burnham was a towering figure in experimental high temperature/pressure geochemistry who first calculated the phase equilibrium relationships in igneous systems from thermodynamics. Under his leadership through 1986 the department's 40 faculty members taught 250 undergraduates and 150 graduate students. A more detailed portrait of the department in 1981 can be found in EMS Bulletin, Vol. 50, No. 5[1].

THE 1980s

At the time of the 75th Anniversary in 1988, the Department of Geosciences consisted of 23 tenured Professors, 5 tenured Associate Professors, 5 tenure-track Assistant Professors, and 10 Professors Emeritus (Anonymous 1988) (Figures 1 and 2). The number of non-tenure-track faculty is not known. Dr. Shelton S. Alexander, a geophysicist, was department head. All faculty were Caucasian males, except Dr. Hiroshi Ohmoto, and one woman, Dr. Susan L. Brantley, who joined the faculty in 1986. As Howell noted in his 1988 review (Howell 1988), the top-heavy demography reflected the post-WW II boom in hiring that accommodated returning servicemen and an emphasis on science during the Cold War. A significant turnover of faculty was now underway. By the end of the decade 10 tenure-track faculty would retire or move to other jobs and 12 new faculty members would join the department, 9 at the Assistant Professor level.

[1] https://scholarsphere.psu.edu/resources/5e1a4c1b-a2c1-46ad-afb4-291a596874c0

EVOLVING GEOSCIENCE PROBLEMS AND METHODS

The decade of the '80s was notable for a significant refocusing of faculty research interests, consistent with major developments in the Earth Sciences. First, the plate tectonics revolution in the 1960s was so fertile that significant discoveries from its application were still being made in fields as diverse as paleontology and ore deposits. For example, in the early 1980s department faculty led by Dr. Hiroshi Ohmoto made the connection between "Black smokers" of hydrothermal fluids at spreading centers and massive sulfide deposits of the Kuroko type. The department's first geodynamicist and heat flow expert, Dr. Kevin P. Furlong, was hired in 1984. Also bolstering studies in plate tectonics were Dr. Terry Engelder (1985), an expert in states of stress and rock strength in the lithosphere, Dr. John Louie (1988), a seismic tomographer, Dr. Steven J. Mackwell (1987), a geophysicist conducting laboratory-based studies of the physical, chemical, and mechanical properties of geological materials, and Dr. Donald M. Fisher (1988), a structural geologist studying active convergent plate boundaries.

Second, an exponential rise in computing power and advances in numerical computation allowed the messy problems of the geosciences to finally be treated quantitatively. The first "personal" computers, the IBM PC and the Apple Macintosh, were introduced in 1981 and 1984, respectively. By 1989 networks of computers were linked together into a global system called the World Wide Web. Although telephone lines and modems connected to PCs were being used by the faculty as rje (remote-job-entry) terminals in the early '80s, the Department of Geosciences got its first true network when Dr. Bill Peterson spearheaded efforts by a group of faculty and grad students to run internet cable above the hung ceiling in Deike hallways. The increase in personal lab computers and connectivity led to a rising number of graduate theses in the Department of Geosciences with titles like "Numerical simulation of the hydrogeologic effects…", and "Mathematical modelling of longitudinal profile adjustment..." (Appendix II).

Third, the establishment of The Environmental Protection Agency (EPA) in 1970, the passage of the Clean Water Act in 1972, and the state certification of "Professional Geologists" created new areas of research and opened up new jobs for geoscientists. Richard R. Parizek, hired in 1961 as a Pleistocene Geologist/Hydrogeologist, already had a well-established program running in hydro- and environmental geology which only grew during the 1980s as environmental consulting firms added jobs (see Appendix III for a detailed account). He was helped by Dr. Michael L. Machesky, a recent hire in low temperature aqueous geochemistry replacing Dr. Donald Langmuir, an aqueous chemist who departed for the Colorado School of Mines.

Figure 1. Timeline of tenure-track and non-tenure track faculty in the Department of Geosciences and its precursor departments.

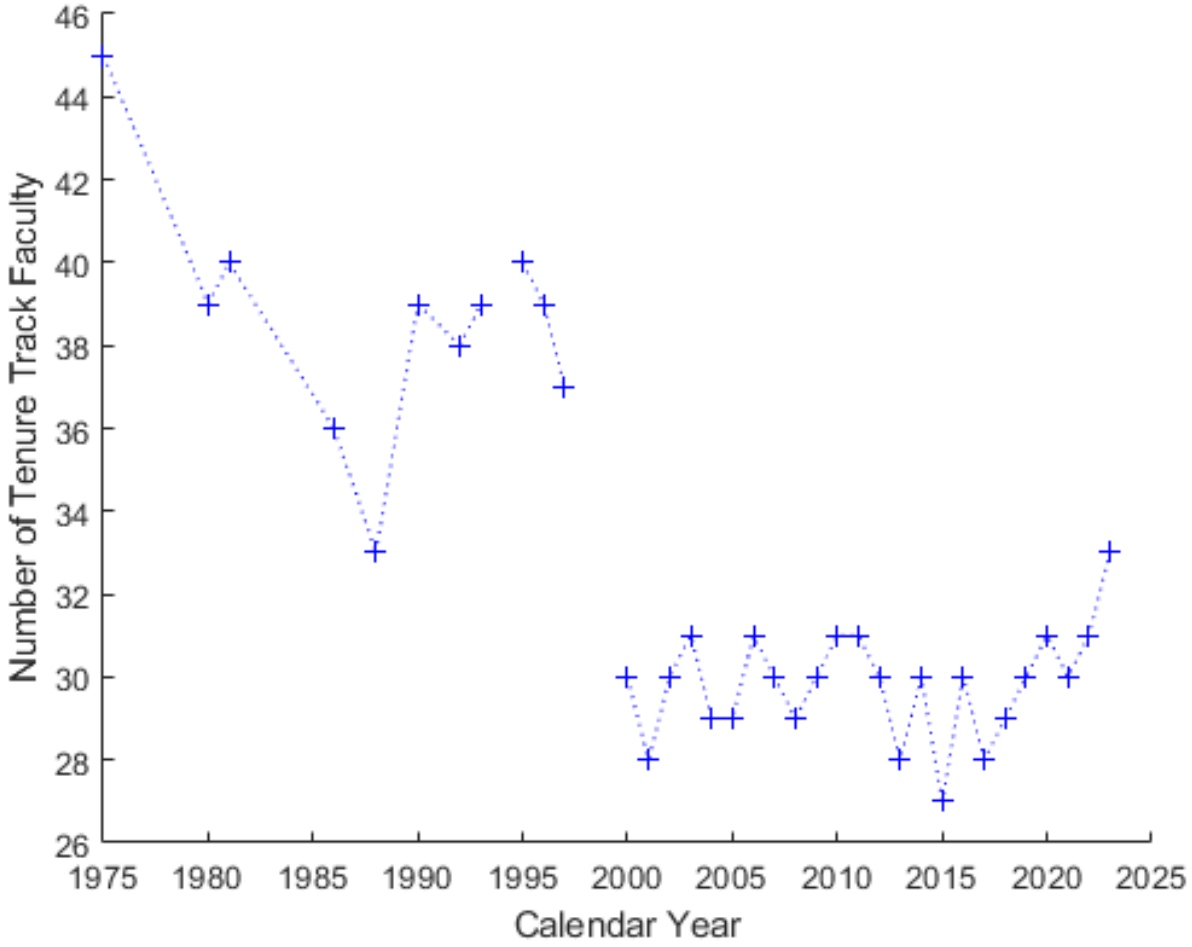

Figure 2. Number of tenure-track faculty in the Department of Geosciences through the recent decades (not including emeritus rank). The drop in numbers immediately prior to 2000 is real but accentuated by differences in who should be counted. In 1975 there were three graduate programs listed separately in the University Course Catalogs ("the Blue Books") found in the university archives in Pattee Library: Geochemistry and Mineralogy (22 faculty), Geology (17), and Geophysics (7), for a total of 45 faculty in the Department of Geosciences. Included in those listings are Mr. Eva Tucker at the Behrend Campus, Dr. Pat Hatcher, a joint appointment with Fuel Science, Dr. Joesph Hammock, a joint appointment with the Department of Mathematics, and Drs. Robert Newnham and Rustum Roy, Professors of Solid State Science as well as Geochemistry. After 1999 the data come from a department spreadsheet that only sometimes includes joint appointments.

They were joined in 1986 by Dr. Susan L. Brantley, initially hired to continue Wayne Burnham's high temperature/pressure studies. She quickly realized that her future lay in studies at lower temperatures where she could analyze the kinetics of water-rock reactions directly, including chemical weathering with and without micro-organisms. The chronological list of department graduate and senior undergraduate theses (Appendix II) provides an informative timeline of the transformation. From 1948 to 1990 over 125 advanced degrees had been granted by the department in

experimental high temperature/pressure research of silicates and oxides. After that there were none, and subjects like chemical weathering, global geochemical cycles of carbon dioxide, and numerical modeling predominated.

Fourth, advances in space satellite technology and military applications of the Cold War allowed unprecedented remote sensing, global positioning, and seismic monitoring. Department faculty were quick to exploit these new data; a good example is the 1980 M.S. thesis by Casey Ravenhurst supervised by Dr. Shelton Alexander: "Utility of digitally merged Seasat-A SAR, Landsat MSS, and magnetic field data sets for mapping lithology and structure in a vegetated terrain."

Fifth, the need to better understand natural hazards was underscored by the eruption of Mount St. Helens on May 18, 1980, and by the Loma Prieta earthquake in the San Francisco Bay Area during Game 3 of the 1989 World Series. Especially important was the realization by scientists that global warming was highly probable. By 1988 a combination of the Keeling Curve and a rather straightforward calculation convinced many scientists that doubling the level of carbon dioxide in the atmosphere should raise the temperature of the surface roughly 3° C. Four new faculty joined the department in 1986-89 who were determined to explore whether that calculation was correct and if so to use Earth's past as a predictor for the future. Dr. Eric Barron, a paleoclimate modeler (1986) and Dr. Lee Kump, a global geochemical cycles modeler (1987) were joined by Dr. Richard Alley (1988) who studied Earth's cryosphere and global climate change, and Dr. James Kasting (1988), a planetary atmospheres and paleoclimate specialist.

At the same time and somewhat in tension with the studies of global warming, the energy crisis of the mid-70s brought increasing numbers of freshmen in the late 70s and early 80s to hydrocarbon-related areas of the department whether viewed as B.S. degrees granted per year (Figure 3) or total enrollees per year (Figure 4), consistent with other departments nationwide (Figure 5). Required courses in the major were taught in large lecture halls in the HUB to accommodate the large numbers. William Duke (1983), an Assistant professor in Sedimentary Geology, was hired in part to help train them, although he left six years later.

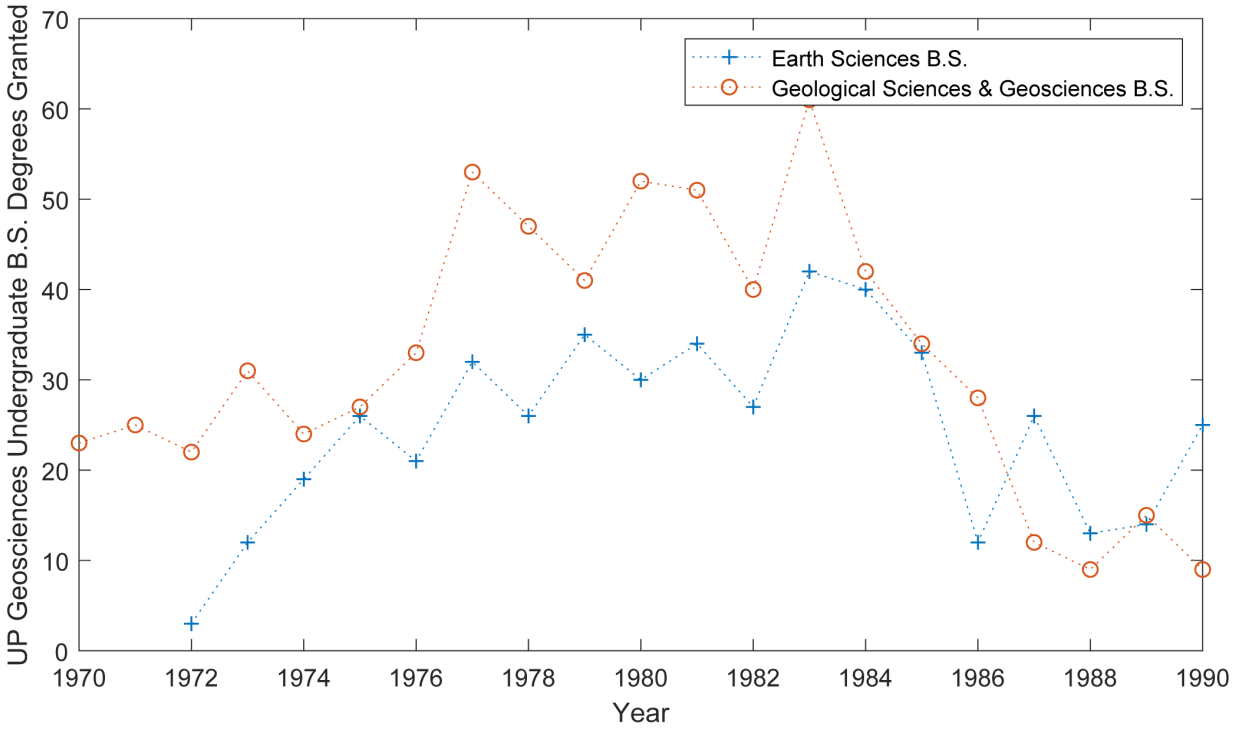

Figure 3. Undergraduate B.S. degrees granted per year by the Department of Geosciences and its Predecessors. Data copied by Slingerland out of three-ring binders in EMS Office as hand tallied by office staff at the time of graduation.

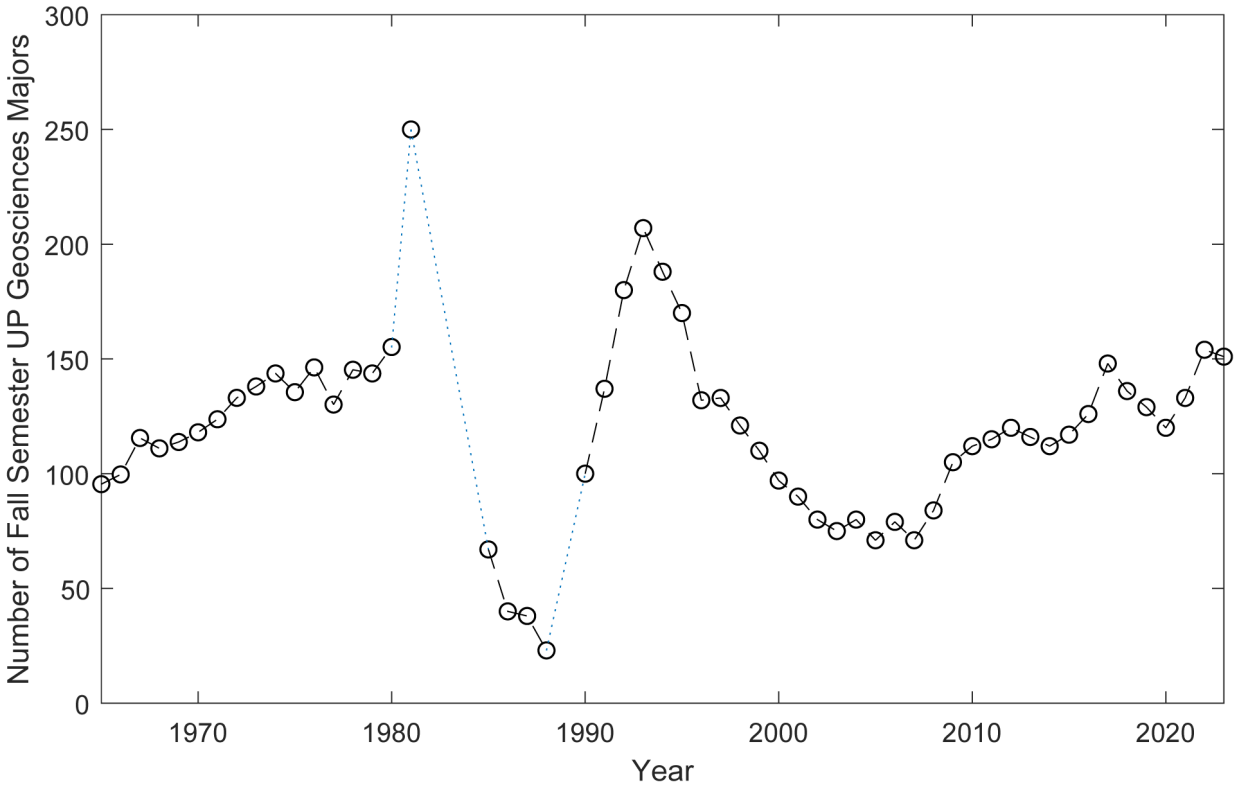

Figure 4. Fall Semester Enrollments of all undergraduate majors accredited to Department of Geosciences (mainly Earth Science and Geosciences B.S. students). Enrollments were never higher than around 1980 in response to the Arab Oil Embargo and rise of hydrogeology. Data sources: 1965 to 1981—(Graham and Thornton 1981); 1982-1989—copied by Slingerland out of three-ring binders in EMS Office as hand tallied by office staff at the time of entry; 1990-2023—Excel Spreadsheet from EMS Office.

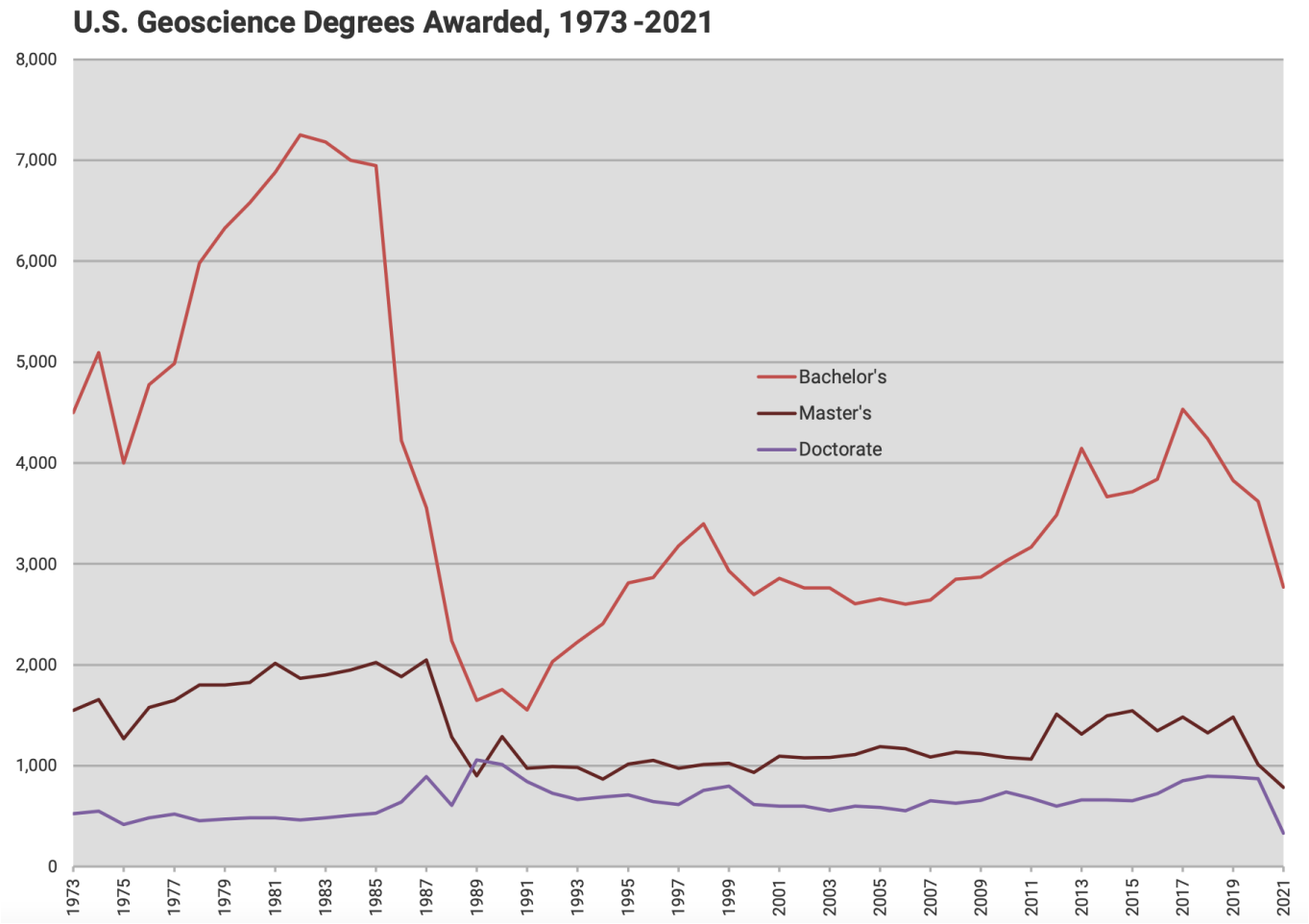

Figure 5. U.S. Geoscience Enrollments from 1973 to 2021 (American Geosciences Institute).

ACADEMIC RESTRUCTURING

Two structural developments helped to promote this shift in faculty expertise and scientific methods. At the College level Deans Charles Hosler and later John Dutton espoused a vision of research activities exploring links between Earth's physical processes and past and future climate change. Monies formerly appropriated by the state towards a Mineral Industries Experiment Station were redirected in 1986 to a newly founded Earth System Science Center (ESSC) with Dr. Eric Barron, a paleoclimatologist, externally hired as its first director. ESSC faculty were to have homes in the departments of Geosciences, Meteorology, and Geography, but have at least part of their salaries come directly from ESSC, thus insuring some allegiance to the mission. The outcome was that Penn State became the early leader in the field of earth system science. As then Center Director, Dr. Eric Barron pointed out (Barron 1988), by 1988 ESSC faculty already had identified its priorities as the global water cycle, the interaction of global tectonics and solar-driven processes, and biogeochemical cycles. The center eventually was transformed into the Earth and Environmental Systems Institute

(EESI) (for a history see this footnote[2]) and a new version of the ESSC was reborn as a center within that institute (this video gives a history of earth system studies in the college[3]).

The second structural development facilitating a transformation of the department was the 1988 merger of the three separate graduate programs in geochemistry-mineralogy, geology, and geophysics into a single geosciences graduate program. This was facilitated by younger faculty without a history of inter-program competition for limited resources. A faculty committee was formed to write a governance document. Although (or maybe because) Penn State was known as a top-down organization, the committee proposed a distribution of power away from the department head and toward an executive committee consisting of the department head, two associates responsible for the graduate and undergraduate programs respectively, and two at-large members selected by the faculty. Even the associate heads were to be nominated by elected faculty members of their respective program committees. Further guards against Department Head autocracy allowed a "Special" faculty meeting to be called "by petition by a minimum of 10 Voting Faculty members." Presumably, this was to forestall stonewalling by department heads. Membership in all this voting was still restricted to "Full" Professors, however. The resulting document, "Governance Procedures, Policies, and General Procedures," was adopted in May of 1988 and although amended, remains the constitution of the department to this day (Appendix IV). Thus, at the end of the '80s decade, the Department of Geosciences was undergoing substantial transformation. E. Willard Miller in his history of the EMS College (Miller 1992) provides a revealing snapshot of the individual faculty and their interests at that time.

THE 1990s

The department during the 1990s was shaped by several factors: 1) a fundamental change in how science in the department was conducted and taught; 2) a steady decline in the percentage of federal research funds applied to the geosciences[4], 3) the loss of 11 faculty retirees during the decade, and 4) a dramatic decline in the number of undergraduates choosing the geosciences as a career.

[2] https://www.youtube.com/watch?v=0h143f0pTaY
[3] https://www.youtube.com/watch?v=0h143f0pTaY
[4] https://www.americangeosciences.org/citations/status-geoscience-workforce-2011

TECHNOLOGICAL INNOVATION

The decade of the '90s saw a fundamental change in how science in the department was conducted. Many faculty now used PCs and Unix workstations in their labs and offices. By the mid-1980s the department's PCs and workstations were linked together by a home-made internet, allowing us to send primitive emails to colleagues. Then in 1989 Deike Building was formally wired for internet, thereby allowing much faster connectivity. Along with this technology came a need for knowledgeable staff to keep it running and the department/college hired its first IT specialists—John Dierks, Jeff Wolfe, and Thomas Canich. In 1993 the first web browser (Mosaic which morphed into Netscape Navigator) made surfing the World Wide Web easier, and in 1996 Google began indexing the Web. The result of these developments was that researchers no longer wrote their scientific papers on yellow legal pads for department secretaries or staff assistants to type, but composed articles at their PCs using *Microsoft Word* (*Word 1.0* came out in October, 1983), *WordPerfect*, or *MacWrite*. Figures were no longer drafted with ink *Rapidograph* pens and lettered with *Leroy Sets,* but rather were drafted on PCs and Macs using vector graphics editors, the most popular of which was *Adobe Illustrator* which first shipped in 1987. Field work was especially impacted when the Global Positioning System (GPS) became fully operational in 1995, although GPS positional accuracy was degraded by the United States military until 2000. In 1998 the Earth System Science Center became home to a Cray Y-MP2E computer, one of the world's fastest systems and the university's first supercomputer. Dr. Eric J. Barron, ESSC Director, said at the time that this was also the first university-based supercomputer to be dedicated to global change research.

THE FACULTY

In 1990 the geosciences faculty consisted of thirty-nine tenure-track professors listed in the University Blue Book for the 1990-1991 academic year (Figure 2). The number of non-tenure-track faculty isn't recorded. The department head was Dr. Shelton S. Alexander, soon to be succeeded in January of 1991 by Dr. Michael A. Arthur, a paleoceanographer recruited from the University of Rhode Island School of Oceanography. Arthur was a geological oceanographer specializing in the circulation and chemistry of past oceans and their relation to changes in paleogeography and global climate, and in the geochemical cycling of various elements. It was no accident that his expertise and interests dovetailed nicely with the mission of ESSC. Although his tenure as department head from 1991 to 1998 would see eleven faculty retirements and only four additions, those additions would be instrumental in furthering the growth of earth systems research.

However accomplished new faculty would become, the department would be forever changed by the loss of eleven retirees and three resignations during the decade, many of whom were particularly adept at administration or undergraduate education. The first to leave (1990) was Dr. Arnulf Muan, professor of geochemistry and materials science. Muan died unexpectedly of an aortic aneurism on December 17, 1990, at the age of 67. He was born in Meldal, Norway, received his Ph.D. degree in geochemistry at Penn State in 1955, and stayed on, holding various faculty positions in geochemistry, materials science, metallurgy, and mineralogy. He served as head of the Department of Geochemistry and Mineralogy from 1966 to 1971 and became the first department head of the newly constituted Geosciences from 1971 to 1974. He was associate dean for research in the College of Earth and Mineral Sciences from 1976 to 1985 and was acting dean of the college in 1985. Muan was probably best known for ten *Phase Equilibrium Diagrams in Oxide Systems* published in 1960 by the American Ceramic Society and co-authored with E. F. Osborn. His Memorial in the *American Mineralogist* noted that these diagrams provided "the fundamental information needed to characterize the physical chemistry of magmatic processes."

Dr. Peter M. Lavin, Professor of Geophysics, retired in 1991 after 32 years of service. He joined the department in 1959 as an Instructor of Geophysics and was appointed Assistant Professor of Geophysics upon completion of his Ph.D. from Penn State University in 1962. His expertise is evident in one of his most cited papers (Behrendt, Tibbetts et al. 1968), an integrated geophysical study—comprising gravity, seismic refraction, and aeromagnetic surveys of a 4,600-km^2 area in Grand Teton National Park. Its profound conclusion, still accepted today, is that the Teton Range has a maximum vertical uplift of about 7 km. Lavin's exploration geophysics courses were sought out by ground water and petroleum geologists and engineers. He supervised 35 M.S. and 6 Ph.D. graduates on topics such as the application of gravity and magnetic data in locating mineral deposits and groundwater resources and the study of major crustal lineaments and the block structure of the crust in the eastern U.S.

Dr. Robert F. Schmalz, Professor of Geology, retired from the department in 1991 after 33 years of service. Schmalz received his B.S., M.Sc., and Ph.D. from Harvard University during the early 1950s before serving in the U.S. Army Chemical Corps as a Research chemist (SP-3). In 1958 he joined the Penn State faculty as an Assistant Professor with expertise in low temperature aqueous geochemistry and an emphasis on marine precipitates and low-level radioactive waste management. Schmalz served as chairman of the Geology Program from 1971 to 1974 and was undergraduate

program coordinator for the department from 1974 to 1977. His most cited paper (Schmalz 1969) argued that "a "deep-basin" model of evaporite deposition is … both geologically reasonable and oceanographically tenable… ." He also was well known for co-editing the 1990 book published by the Pennsylvania Academy of Sciences: *Environmental Radon: Occurrence, Control and Health Hazards*. Later in his career Schmalz became famous on campus for his introductory geosciences course for non-majors, Geological Sciences 20. He supervised at least 2 M.S. and 1 Ph.D. graduate students (the numbers are a minimum because of incomplete data). Dr. Schmalz also served for many years as member and as Chairman of the State College Borough Water Authority.

Dr. Charles P. Thornton, volcanologist, mineralogist, regional stratigraphic and structural geologist, and probably most importantly, undergraduate educator, retired in 1992 after two stints on the department's faculty. During World War II Thornton served in the army as a specialist in the Japanese language. Upon discharge he earned his Ph.D. at Yale University with a dissertation on the Mount Jackson quadrangle in central Virginia. He was hired at Penn State, teaching courses in petrology, crystallography and mineralogy, as well as other aspects of geology. For unknown reasons Thornton left PSU to teach in Bucknell University's Geology Department for several years but returned and served until retirement in 1992. He supervised at least 6 M.S. and 12 Ph.D. graduate students (the numbers are a minimum because of incomplete data). Thornton is best known for his role in training undergraduates in the geosciences. For many years, he oversaw the undergraduate program of instruction in the Department of Geosciences. Even his best-known science paper, published with fellow Penn Stater, O. F. Tuttle, "…represent the results of the authors' attempts to provide a systematic view of the chemistry of igneous rocks for students" (Thornton and Tuttle 1960).

Dr. Deane K. Smith, Professor of Mineralogy, retired in 1994 after 26 years of service to the department. Smith graduated from the University of Minnesota in 1956 with a doctorate in geology and spent the next four years as a research associate at the National Bureau of Standards in Washington, D.C. During the 1960s, he worked as a chemist and diffraction specialist in the Inorganic Materials Division of the Lawrence Radiation Laboratory in California. In 1968, he joined Penn State University's Department of Geosciences as an associate professor and became professor in 1971. Smith is best known for developing a powder pattern calculating program which over time became the accepted standard for such computations, and for which he won the C. S. Barrett Award in Diffraction Analysis from the Denver X-ray Conference. A newly discovered mercury chromate sulfide mineral, *deanesmithite*, was named after him. He supervised at least 5 M.S. and 4 Ph.D. graduate students (the numbers are a minimum because of incomplete data).

Also retiring in 1994 was Dr. Alfred Traverse, Professor of Palynology and an internationally recognized expert on the palynostratigraphy and paleoecology of the Devonian, Triassic/ Jurassic, and Cenozoic rocks of North America, the origin of plants, and the sedimentation of palynomorphs. After five years with the US Bureau of Mines and six years with Shell Oil, Traverse surprised colleagues by enrolling in the Episcopal Theological Seminary and was ordained a deacon in the Episcopal Church in 1965. He came to Penn State in 1966 at the age of 40 as an Associate Professor of Palynology where he lectured on evolution, philosophy, and religion in full clerical garb (Riding, Chaloner Frs et al. 2016). He supervised 12 Ph.D. students, and many future palynologists in their geosciences and biology undergraduate days at Penn State. Of his 120 scientific contributions between 1950 and 2015, probably the most influential was his textbook *Paleopalynology*, now in its 2nd edition. He even named a fossil pollen (*Cyrillacaeaepollenites Joabthomasii*) for then University President Joab Thomas in recognition of Thomas's background as a botanist.

Nineteen ninety-six saw three more retirements: Dr. Hubert L. Barnes (37 years of service), Dr. Albert L. Guber (33 years), and Dr. Arthur X. Rose (32 years). Dr. Hubert L. Barnes, distinguished professor of geochemistry and Director of the Ore Deposits Research Section came to Penn State in 1960 after a B.S. from MIT, a Ph.D. in Economic Geology from Columbia University (1958), and a post-doc at the Geophysical Laboratory of the Carnegie Institution in Washington, D.C. Over his 34 years at Penn State Barnes became known internationally for his research on hydrothermal processes of geothermal and ore-forming systems. His science involved experiments at high pressures and temperatures and thermodynamic and kinetic computations, all reported in more than 150 publications in professional journals and six books. Barnes also served as Chairman of the Department's Geochemistry and Mineralogy Program and was a consultant for more than 30 corporations in work that produced five U.S. patents. Of particular significance, Barnes supervised nine M.S. students, 32 Ph.D. students, and 21 post-doctoral fellows, thereby populating many of the geochemistry labs in the U.S. and abroad.

In 1963 Dr. Albert L. Guber was appointed a visiting professor of geology in the Geology and Geophysics unit of the colleges' Division of Earth Sciences. Guber was a young paleontologist recently graduated from the University of Illinois and coming off a National Science Foundation postdoctoral fellowship at the Universities of Stockholm and Uppsala and Imperial College, London. At Penn State Guber continued his early work revolving around problems of sexual dimorphism and taxonomy of Ordovician Ostracodes while branching into studies of western Pennsylvania coals, showing for example, that their sulfur content could be predicted by knowing the origin of their covering shales. He supervised at

least 11 M.S. and one Ph.D. graduate students (the numbers are a minimum because of incomplete data), but he would become best known for his superb undergraduate teaching. In 1972 he helped create, and became the Director of, Penn State's ten-week field and lab program at the Wallops Island Marine Science Consortium on the Virginia Eastern Shore. The program reflected Guber's conviction that hands-on problem definition, data collection, and hypothesis testing was the best training one could give the next generation. In 2020 his former students endowed the Al Guber Program Fund in the College of Earth and Mineral Sciences in recognition of his life-long impact.

Dr. Arthur W. Rose earned an M.S. in geology in 1955 and a Ph.D. in geochemistry in 1958 from the California Institute of Technology before beginning a career as Geologist and later Senior Geologist for Bear Creek Mining Co. in Arizona and Utah. While with Bear Creek, Rose developed exploration methods and applied them in the search for copper deposits. In 1964 he joined the Alaska Division of Mines and Minerals in Anchorage as a Mining Geologist to conduct geological mapping and geochemical surveys in Alaska. In 1967 Rose joined the Department of Geosciences as an Associate Professor of geochemistry, teaching economic geology, geochemical exploration, and environmental geology/geochemistry. During his 32 years at Penn State he authored 135 papers, the most cited of which—"Geochemical evaluation of flowback brine from Marcellus gas wells in Pennsylvania, USA"---was written seven years after retiring. His book, *Geochemistry in Mineral Exploration* published in 1979, remains one of the leading textbooks in the field. Rose supervised 16 Ph.D. and 33 M.S. graduate students and consulted for over 20 companies as a registered PA Professional Geologist. He served as Director of the Mineral Conservation Section in the college and as a member of the National Research Council Board on Mineral and Energy Resources.

Nineteen ninety-eight saw two more retirements: Dr. David P. Gold, professor of geology (34 years of service), and Dr. Alan Davis, Professor and Director of the Coal and Organic Petrology Laboratories (26 years). Gold joined the faculty in 1964 as a Research Associate in Geochemistry and Mineralogy after receiving his B.Sc. (1954) and M.Sc. (1958) in geology from the University of Natal, South Africa, and his Ph.D. (1963) from McGill University, Montreal, Canada. In 1968 he was promoted to Associate Professor of Geology and Geophysics in the department, and in 1975 obtained professor status. From 1977-1982 he served as chairman of the Geology Graduate Program. Although primarily an economic geologist, Gold is especially known for his contributions to shock metamorphism and impact craters, fracture trace and lineament analysis, and the emplacement mechanics of carbonatites and kimberlites. He taught many short courses for the National Ground Water Association and conducted resource evaluations for Pennsylvania citizens as a

registered PA professional geologist. His most cited published work—"Post-Alleghanian unroofing history of the Appalachian Basin, Pennsylvania, from apatite fission track analysis and thermal models"—quantified for the first time the erosional history of the Appalachian Orogen from the Permian to the present. Gold's most profound impact was in training future geoscientists. He supervised 29 B.S., 24 M.S., and 15 Ph.D. theses over his thirty four-year teaching career and taught 15 different courses at Penn State, focusing primarily on economic, structural, and particularly field geology. He was best known for passing on his hard-earned lessons from his field work in South Africa and northern Quebec to students in the department's summer field school.

Dr. Alan Davis was appointed Associate Professor of Coal Geology in 1973. Davis was an expert on the optical properties of coals and their relationships with coal origin and utilization. He used luminescence and reflectance microscopy in the study of coal structure and the interpretation of the thermal, tectonic, and environmental histories of coal. He served in the Coal Research Section as assistant Director until 1986, and from 1986 to 1987 as Director. From 1987 to 1992 he served as Director of the Energy and Fuels Research Center, and then from1992 to 1997, as Director of the Coal and Organic Petrology Laboratories. His retirement effectively ended a half-century of coal studies in the department. He supervised at least 11 M.S. and 13 Ph.D. graduate students (the numbers are a minimum because of incomplete data).

Thomas Gardner, Professor of Geomorphology, resigned in 1995 to take an endowed professorship at Trinity University. Dr. Steve Mackwell left in the mid-1990's for a position at the National Science Foundation, and Dr. Sean Willett resigned in 1998 to take a job at the University of Washington.

ARRIVALS

In 1991 and 1992, Drs. Katherine Freeman and Mark Patzkowsky joined the faculty as tenure-track Assistant Professors. Freeman developed methods to analyze stable isotope ratios of fossil biomolecules and other organic compounds and used those isotopes to study past climate, biogeochemistry, and astrobiology. Patzkowsky focused on the ecological, evolutionary, and geological processes that control the diversity, distribution, and abundance of fossil taxa in time and space. In 1993, Dr. Sean Willett was hired as an Assistant Professor to bolster studies in geodynamics and mechanical modeling of convergent tectonics, and Dr. Peter B. Flemings as an Assistant Professor to bolster studies in stratigraphy and sedimentary basin analysis. His interests quickly evolved into basin-scale fluid flow, methane hydrates, and petroleum geology.

In 1994 Dr. Andrew Nyblade joined the tenure-track faculty with an expertise in using seismic and potential field data to study the origin, structure, and composition of the lithosphere and upper mantle. In 1995 Dr. Todd A. Sowers was appointed as Assistant Professor of Geosciences with research interests in Pleistocene-Holocene paleoclimatology and assessment of the anthropogenic impact on the composition of the atmosphere. These hires are a testament to Arthur's leadership, coming to fruition as the department experienced a 10% reduction in permanent funding during the mid-1990s.

In 1997 Dr. Rudy L. Slingerland was named the new head of the Department of Geosciences, succeeding Dr. Michael A. Arthur, who returned to full-time teaching and research after serving as head since 1991. Slingerland was home-grown, having received his M.S. and Ph.D. from the department in 1973 and 1977, respectively. He was a sedimentary geologist/geomorphologist and member of ESSC who advocated studying geological systems through mathematical and computational models. Along with Slingerland in the late '90s came three new faculty. Douglas Burbank (1998), a tectonic geomorphologist joined as a Professor of Geosciences with expertise in active tectonics; structural and stratigraphic evolution of fold and-thrust belts and foreland basins, and the physiographic evolution of mountain ranges. Dr. Peter Heaney (1999) joined with the rank of Associate Professor. Heaney filled the void left by the retirement of Deane Smith, thereby keeping mineralogy and crystallography a Penn State enterprise. His research focused on the use of synchrotron X-ray radiation to monitor the growth, dissolution, and transformation of nanominerals. Dr. James Kubicki (1999), hired as an Assistant Professor, was a complementary hire in environmental geochemistry. He specialized in sophisticated computer models informed by quantum mechanics to simulate mineral surface structures and reactions.

NON-TENURE-TRACK (NTT) FACULTY

Non-tenure-track faculty in the department have long toiled in relative anonymity under various names—Fixed Term Appointee, (Assistant/Associate) Research Professor, (Senior) Research Associate, (Assistant/Associate) Teaching Professor, Professor of Practice, Lecturer, Instructor, and more. By 2020 the department classified its faculty on its website into four categories: Affiliated, Tenure-line, Research/Teaching, and Emeritus. Titles such as Associate Professor or Research Scientist could be found in all four categories. For the purposes of this history, we will use the older categories of tenure and non-tenure track (NTT), consistent with the eras under discussion. In the 1970s and '80s the department employed few, if any, non-tenure-track faculty, but the numbers rose through the subsequent decades at least in part because the department accommodated dual-academic spouses/partners and individuals who wanted to pursue

either teaching or research but not both. In 2000 there was one[5] non-tenure-track member; in 2010 there were five[6] ;in 2020 there were nine[7]. All were given offices and access to staff and cyberinfrastructure, and in some cases a lab. Most received some portion of their salary and full Human Resource benefits from the department with the balance of the salary to be acquired by them through research grants. By the 21st Century the NTT faculty were granted most of the rights and privileges of tenure-track faculty such as full participation in faculty meetings, a vote on new tenure-track hires, a voice in the future direction of the department during strategic planning meetings, and supervision of undergraduate and graduate students (in the latter case only if they qualified for membership in the graduate school faculty). As such, their contributions to the reputation of the department were probably substantial, but not well quantified.

During the 1990s three NTT faculty were recorded on the department website: Drs. Mary-Anne Mahaffy, Sridhar Anandakrishnan, and Tanya Furman. Mahaffy was an ice-sheet modeler associated with what was then ESSC. Anandakrishnan, a glaciologist and seismologist, left for a faculty position at the University of Alabama and was hired back in a tenure-track position in 2002. Furman was appointed an Associate Professor of Geosciences with research interests in the tectonic and magmatic evolution of individual volcanic systems, continental and oceanic rift zone magmatism, and weathering processes in forested watersheds.

CURRICULAR AFFAIRS

UNDERGRADUATE

As outlined in the department's governance document of May 1988 (Appendix IV), the undergraduate program was administered by an Associate Department Head for Undergraduate Programs responsible for course offerings and registration activities, assignment of teaching responsibilities, supervision of the advising system, development of curricula and courses, recruitment of new majors, annual assessment of the program, and chairing the undergraduate program committee. The department (implicitly) required that the Head be a Ph. D. faculty member. During the 1990s Professors Albert Guber, Earl K. (Buzz) Graham, and Tanya Furman ably served in this vital role.

Undergraduate majors in the department started to rise in the early 1990s (Figure 6) after bottoming out in the late 1980s (Figure 4). But the rebound was short-lived as fewer males entered the major. The good news was that the gender ratio

[5] https://web.archive.org/web/20000612072056/http://www.geosc.psu.edu/People/Faculty.html
[6] https://web.archive.org/web/20100612032731/http://www.geosc.psu.edu/people/faculty/faculty_research.php
[7] https://web.archive.org/web/20200929091847/https://www.geosc.psu.edu/academic-faculty/directory

became more nearly equal. The decline in numbers was specifically due to a decline in the Earth Sciences B.S. (Figure 7) for reasons not entirely clear, but probably related to a major increase in the rigor of physics and math prerequisites.

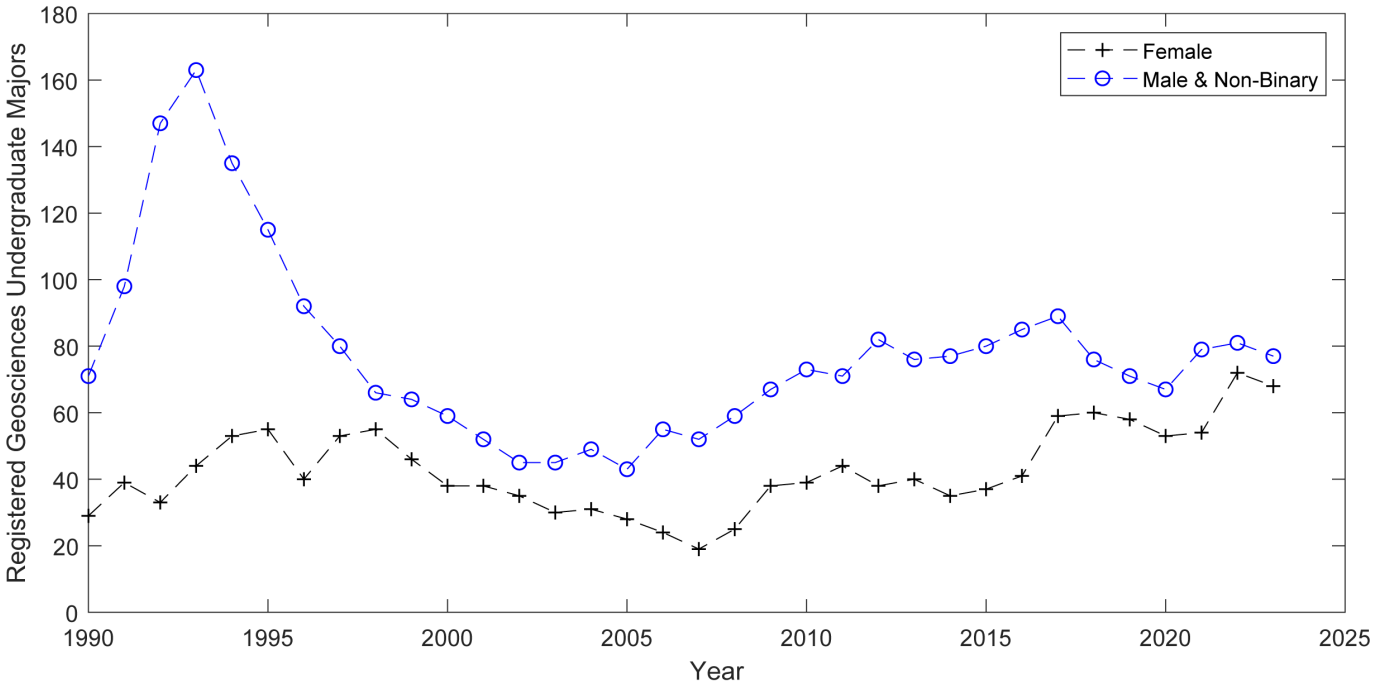

Figure 6. The number of Penn State Geosciences majors matriculating fall semester over the interval for which we have good data (1990 to 2023). Numbers include Earth Science and Policy B.S.; Earth Sciences B.S.; Geobiology, B.S.; Geosciences B.A.; and Geosciences B.S. The decline in enrollment from a high in the early 1990s mirrors geosciences enrollments nationwide (Fig. 4), although is time-delayed by about five years. By 2023 the gender ratio was approaching 50/50 (Data from Department of Geosciences electronic database).

The retirement of so many faculty and the rapid growth of new fields of research in the geosciences led to a significant revision of the undergraduate curriculum. A broader range of subdisciplines composing the geosciences and an increased breadth of the job market meant that students needed to have broader opportunities in their courses. As then Dean John Dutton pointed out (Dutton 1993): in 1982 fewer than a third of EMS majors were in subjects focusing on the Earth and environment—Earth Science, Geosciences, Geography, and Meteorology, whereas in 1992 some 68 percent were enrolled in these majors. Plus, the faculty felt that a culminating, year-long, senior research project had particular merit in developing independent thought.

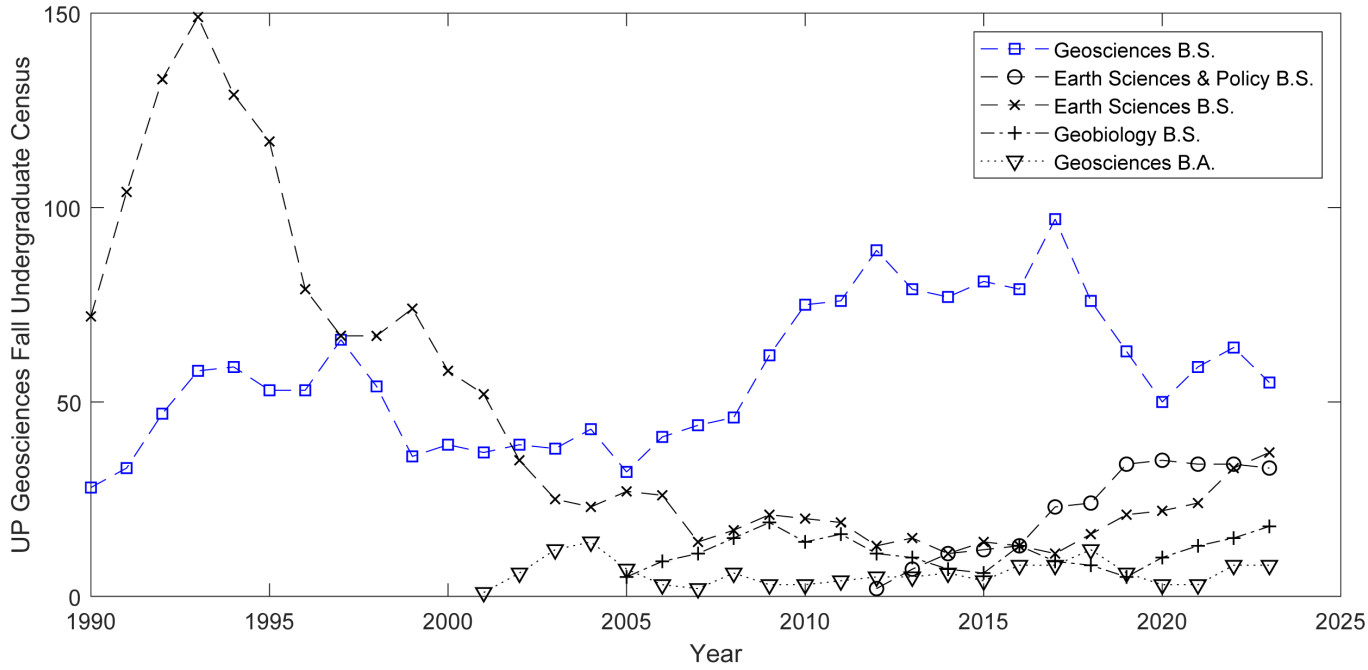

Figure 7. Department of Geosciences Undergraduate Enrollments by major over the interval 1990 to 2023 (Data from Department of Geosciences electronic database). The department has tried numerous different degree options in response to perceived student needs.

To accommodate these changes the earlier undergraduate options of General Geosciences, Geophysics, and Biogeology were abolished, and a new curriculum was approved by the University in the summer of 1990 (Thornton 1990). It consisted of four components: (1) courses needed to satisfy the University's requirements in communication skills, arts, humanities, social or behavioral sciences, and physical and health education [31 credits]; (2) Eight credits of calculus, eight of chemistry, 12 of physics, and four of either biology or more advanced math courses [32 credits]; (3) specifically required courses in the geosciences [34 credits]; and (4) electives [27 credits]. Four new required core courses were created: *Physical Geology*—a survey of the physical and chemical aspects of the solid Earth, *Earth Materials*—the properties, origin, and identification of Earth's minerals and rocks, *Physical Processes in Geology*—an examination of the physical processes that act at the Earth's surface and interior that draws upon the students physics and math courses, and *Earth History*—the principles and techniques of stratigraphy and paleontology and their use to reconstruct the past history of the Earth and its life. Also required of all majors was Structural Geology—an examination of mechanical deformation in the lithosphere and *Field Geology*—a 7-week-long course of rather intensive field work after the junior year devoted to about half-a-dozen specific but interrelated projects that served to integrate what was learned in the previous courses.

Affectionately known as “field camp”, the course had long been organized by D. P. Gold. When he retired in 1997, Donald M. Fisher took over as Director of the Geosciences Summer Field Program (Field Camp).

Perhaps the most novel change was a year-long senior level research project culminating in a Senior Thesis. The object was to provide valuable experience in formulating and investigating an interesting problem and presenting the results effectively to colleagues. Faculty submitted potential topics for students to select. Students typically worked closely with graduate students in the faculty advisor’s group commencing Fall semester of the student’s senior year. A senior thesis course provided guidance in writing a dissertation to be approved by the Associate Head for Undergraduate Programs and the faculty mentor. Students presented their research before graduation, typically at the end of the spring semester. To provide financial support a new fund was established through an initial contribution from Dr. Thomas F. Bates, professor emeritus of mineralogy—The Undergraduate Research Enhancement Fund for Geosciences.

The remaining elective components of the program (27 credits) were envisioned as… “building strength in some particular area of the geosciences--in geophysics or paleontology or hydrogeology for example,” or… “to broaden horizons in other disciplines or acquire competence in a foreign language, or pursue courses needed for admission to law or business school” (Thornton 1990). Although modified—as for example in 1993 when a new minor dealing with global change (the Earth System Science minor) was created and in 1995 when the B.S. in Geosciences was reorganized to provide students with two options: a General Option and a Hydrogeology Option—this remains the undergraduate curriculum for Geosciences B.S. majors to this day.

GRADUATE

In parallel with the undergraduate program, the department’s graduate program was run by an Associate Department Head for Graduate Programs & Research who chaired a graduate program committee. The Associate Head’s duties included executive authority for all Graduate Program activities (with approval of the Graduate Program Committee), appointing the Graduate Admissions, Candidacy, M.S., and Doctoral Committees, administering annual reviews of student progress, and coordinating department-wide research facilities, such as computers, field equipment, rock cutting and grinding equipment, etc. As with the Undergraduate Program Head the department (implicitly) required that the Graduate Program Head be a Ph. D. faculty member. During the 1990s, Professors Eggler and Kump ably served in this vital role.

The number of graduate degrees awarded by the department declined over the decade from an all-time high in the 1980s (Figure 8). The 1980s high can be attributed to a large faculty (Figure 2), the Clean Water Act of 1972 after which the number of environmental consulting firms soared, and the Arab Oil Embargo of 1973 when U.S. hydrocarbon companies went on a geoscientist hiring spree. Because the department policy had long been to support all its graduate students making adequate progress, some of this decline most certainly reflected a self-imposed birth control as federal dollars dried up and as senior faculty were replaced by assistant professors still trying to obtain research grants. Like the undergraduate students, the gender ratio of the department's graduate students became more nearly equal over the decade (Figure 9). What factors brought this about remains to be explored.

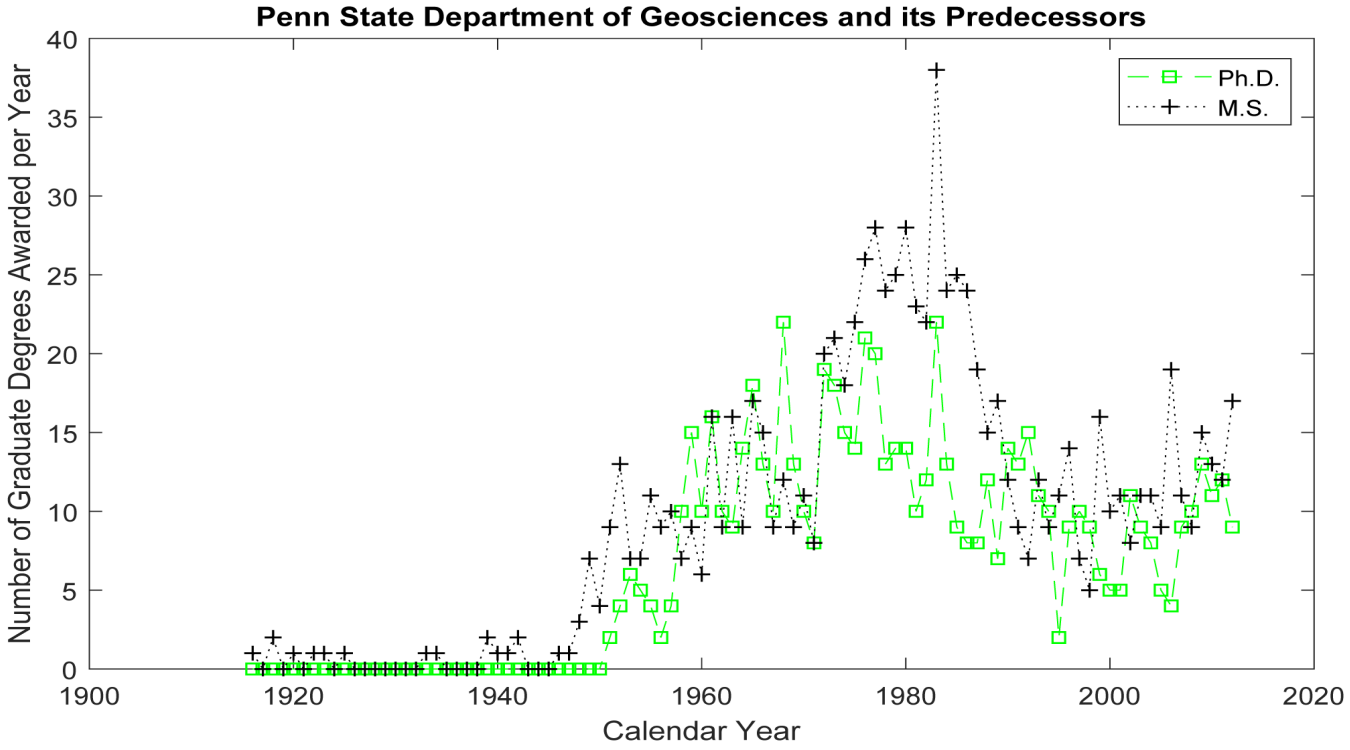

Figure 8. Number of Graduate Degrees Awarded per Year by the Department and its Predecessors. The high numbers of graduate degrees in the 1980s are correlated with a large faculty (Fig. 2), the Clean Water Act of 1972 when the number of environmental consulting firms soared, and with the Arab Oil Embargo of 1973 when hydrocarbon companies went on a geoscientist hiring spree (Data from spreadsheet in Appendix II compiled by EMS College and partially corrected for this document by comparison with theses in PSU Library).

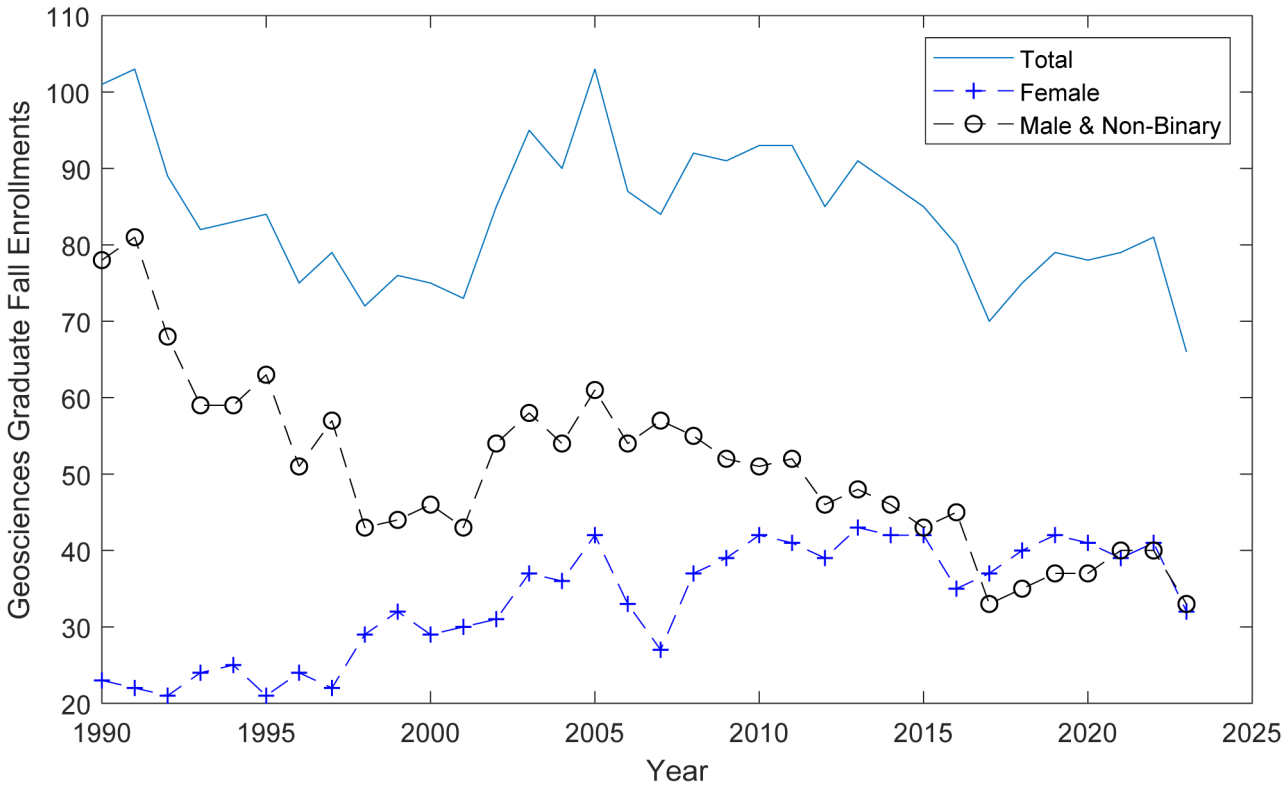

Figure 9. A more granular view of the last 30 years of graduate student enrollment in the department. The overall decline in total number from over a hundred to between about 70 to 80 reflects the scarcity of financial support for student stipends and a greater proportion of assistant professors who support fewer students as opposed to a decline in qualified applicants or a change in faculty size. Data from Department of Geosciences electronic database.

CENTERS, INSTITUTES, AND FUNDED MULTI-INSTRUCTOR PROGRAMS

NEW ENVIRONMENT INSTITUTE

From its beginnings in the mid-1980s the Earth Systems Science Center had grown explosively in researchers and disciplinary breadth. Standing-room-only crowds greeted James Lovelock in 1993 when he visited the Earth System Science Center in April and gave a lecture titled "Geophysiology—An Update." Lovelock was an influential and unorthodox British scientist, philosopher, and inventor who originated the Gaia hypothesis and was the founding spirit of earth system science. By 1999 it was time to reconstitute ESSC into something even broader—a new EMS Environment Institute to foster interdisciplinary research across physical and social sciences. The institute would later morph into the Earth and Environmental Systems Institute (EESI). Dr. Eric J. Barron, Director of the original Earth System Science Center, served as the first Institute Director. Two new initiatives were developed under the guidance of the Institute: a Natural Hazards Initiative to examine the science and impacts of storms, earthquakes, volcanoes and other hazards with

department members Dr. Kevin P. Furlong and Dr. Douglas Burbank, and a Center for Environmental Chemistry and Geochemistry to promote joint research projects, shared research facilities, and student support and recruitment for fields related to environmental chemistry. Dr. Susan L. Brantley, Associate Professor of geosciences, was appointed as the new Director of the Center, succeeding Patrick Hatcher who moved to Ohio State.

NASA ASTROBIOLOGY INSTITUTE

In the late1990s Penn State was selected as one of eleven institutions invited to form a new NASA Astrobiology Institute, that would conduct interdisciplinary research on the issue of life in the universe and its cosmic implications. Penn State's Astrobiology Research Center [PSARC] was initially directed by Geosciences Professor Hiroshi Ohmoto and involved faculty members in Geosciences (James F. Kasting and Lee Kump), Chemistry, Biochemistry and Molecular Biology, and Biology and the Institute of Molecular Evolutionary Genetics. A five-year, $4.5 million grant from NASA allowed PSARC researchers to carry out investigations into the origins of oxygen and evolution of marine and terrestrial organisms.

PETROLEUM GEOSYSTEMS

In 1999 a new EMS M.S. graduate program dubbed Petroleum Geosystems was created by Dr. Peter Flemings and Dr. Turgay Ertekin, professor of petroleum and natural gas engineering, to address the realization that many fundamental research problems lay at the interface between geosciences and petroleum engineering. Plus, there was a growing need in industry for interdisciplinary scientists trained in problem-based collaborative research. Graduate students in the program became members of an interdisciplinary team consisting of a petroleum engineer, a geophysicist, and a geologist, shared common office and lab space, held summer internships with the corporate sponsors, and used company resources to pursue their individual theses. Fellowships and lab instruments were provided by Texaco, Shell Foundation, IBM, Landmark Graphics, and Chevron.

DEPARTMENT STATURE

The decade of the 1990s was particularly notable for the rising stature of the department within the international geosciences community. Appendix V lists the known faculty awards during the period. Faculty were tapped to sit on various national and international committees such as the national Nuclear Waste Technical Review Board (Parizek), the Polar Research Board of the National Research Council (Alley), and more. Faculty in the Earth System Science Center

(ESSC) were appointed as one of the major interdisciplinary groups involved in "Mission to Planet Earth," NASA's central contribution to the U.S. Global Change Research Program. The mission consisted of a series of satellites called Earth Probes and the Earth Observing System (EOS). The faculty also were becoming quite competitive at funding their research. As then department head Michael A. Arthur noted in 1997 (Arthur 1997): "…Penn State's Geosciences faculty have the highest level of grant/contract procurement of any CIC Geoscience Department…" [The CIC was the academic equivalent of the Big10 athletic conference]. The 1989 Gorham Report on Undergraduate Programs ranked Penn State Geosciences 12th in the nation (out of 190 programs) and the 1995 National Research Council Survey of research and Ph.D. programs ranked the department 12th out of I00 Ph.D.-granting geology departments in the U.S. By 1999 our stature among graduate programs had risen even higher to seventh in geology, third in sedimentology/stratigraphy, fifth in geochemistry, and fifth in hydrogeology.

THE 2000s

The decade of the aughts saw the department responding to multiple external crises. In 2001, the dot-com bubble burst, leading to a decline in U.S. economic activity. This was exacerbated by the Global War on Terrorism after the September 11 attacks in 2001. To address the economic slowdown the U. S. Federal Reserve cut interest rates several times, thereby allowing an economic revival. But an unintended consequence was predatory lending in the form of subprime mortgages. These led to multiple bank failures and the 2008 Great Recession—the most severe global recession since the Great Depression. Tax deficits at the state level forced the department to make cuts to some educational and research programs[8]. On top of these economic crises and wars, the World Meteorological Organization (WMO) announced in December 2009 that the 2000s might have been the warmest decade since records began in 1850. One of the deadliest heat waves in human history happened during the 2000s, mostly in Europe, killing 37,451 people[9]. Climate change and global warming became household words during the decade, making the department's commitment to ESSC all the more compelling. Also influencing research in the department was the deadliest natural disaster and most powerful earthquake of the 21st century. On Boxing Day, 2004 a 9.1–9.3 Mw earthquake and its subsequent tsunami struck multiple nations in

[8] https://www.geosc.psu.edu/alumni/stay-connected/issue/20091/geosciences-newsletter-2009 , p. 2
[9] https://www.earth-policy.org/mobile/releases/update29

the Indian Ocean killing 230,000 people. Dr. Charles Ammon, an expert on large magnitude earthquakes, gave multiple interviews after the quake and department faculty studied the aftermath with the intent of predicting future occurrences.

Possibly because of this economic and social turmoil the department experienced dramatic changes in enrollments, staffing, and disciplinary focus. At the start of the decade the department taught the fewest numbers of undergraduate majors since the 1960s (Figures 4 and 7), awarded fewer advanced degrees than previously (around 10 per year), and saw its tenure-track faculty stabilize around 30, significantly fewer than in previous decades (Figure 2). Undergraduate and to a lesser extent, graduate enrollments rebounded during the decade as the price of oil rose from $25 to $147 inflation-adjusted dollars a barrel and the new technology of fracking organic-rich shales in the U.S. caused a hiring frenzy. For example, by 2007, 14 petroleum companies were visiting the department offering internships even to undergraduate students. With the retirement of early baby-boomers, jobs were opening for Ph.D. graduates, especially in energy, water, natural hazards, and global warming. The decade also saw the flowering of two new fields in the Earth Sciences. Major advances in molecular biology such as the completion of the Human Genome Project in 2003 and automation of gene-sequencing led to new disciplines such as molecular paleontology and microbial paleontology. New methods of exploring space led to new fields of study in the Earth Sciences such as comparative planetology and astrobiology. In 2001 a team of astronomers from the Hubble Space Telescope Key Project made the most accurate measurement yet of the age of the universe: 13.772 billion years (give or take 59 million years)[10]. In 2004 the Mars Exploration Rover Mission successfully sent detailed data and images of the Martian landscape back to Earth. By 2008, NASA's Mars Phoenix lander had successfully collected samples showing the presence of ice, thereby pointing to the possible existence of biological life on the red planet. The search for other habitable planets became a respected pursuit which the department wanted to participate in.

TECHNOLOGICAL INNOVATION

The decade of the aughts saw the rise of laptops, wireless connections, and smartphones. Department faculty and staff expected to work in alternative places, such as in coffee shops or remotely from home. Dress became even more casual compared to 1980 when the faculty uniform in the department was a white shirt with tie and dress slacks for men and dresses for women (not that there were any female faculty then). Now casual clothes in the office enforced the idea that

[10] https://www.nytimes.com/2008/03/09/science/space/09cosmos.html

people's work and feelings were more important, although the department never approached the extremes of Silicon Valley with its yoga classes, dog walkers, and massage therapy. Email replaced "snail mail" when communicating with researchers in distant locations. Google came to be used as a verb, and YouTube and Wikipedia ascended to the top 10 most popular websites. Literature reviews evolved from painfully scouring the Geological Society of America's *Bibliography and Index of Geology* (GeoRef) to copying citations from Google Scholar, first beta-tested in 2004. By 2005 the website was supporting bibliography managers like *EndNote*.

THE FACULTY

In November of 2000 then department head, Rudy Slingerland, resurrected an annual department newsletter and in a cover letter summarized the state of the department: "The faculty consists of 32 tenure-track members and four soft-money research scientists…." (ed.—although our website at the time only listed one non-tenure-track member). Our faculty average age is 49, but it's a bimodal distribution with one mode around 61 and another around 38. The disciplinary composition over the last 40 years has changed significantly in response to evolving trends in our science. Whereas in the 1960's we were known for high T/P experimental petrology, coal geology, and hydrogeology, now we are known for our studies of global change, numerical modeling of earth systems, crustal geodynamics, and astrobiology." As predicted by the bimodal faculty demographics, nine faculty members were to retire over the decade. Fourteen replacements were hired over the decade, a surprisingly large number given our modest undergraduate enrollments at the time and declining state appropriations. It must have helped that the EMS Dean at the time was a member of the department, Eric J. Barron. He was quick to take advantage of various University-funded initiatives to promote inter-department/college research. Also helpful was a university policy encouraging the recruitment of minorities. Additional salary monies were provided by the Provost's Office in the event a trailing spouse was a qualified academic. By the end of the decade three additional faculty were supported in this manner.

DEPARTURES

Reflected in the faculty numbers were shifts from tenure-track to research faculty, such as in 2000, when Dr. Todd Sowers decided he liked research more than teaching and became an Associate Research Scientist in the department. Plus, three faculty advanced their careers elsewhere. In 2001 Charles Langston, Professor of Geophysics, left to join the Center for Earthquake Research and Information at the University of Memphis; Eric Barron became the Dean of the College of Earth and Mineral Sciences although formally remained on the books as a Geosciences faculty member, and then in 2006 left to

head the Jackson School of Geosciences at the University of Texas. Soon after, Associate Professor Peter Flemings followed Barron to Texas.

The first of the faculty to retire in the decade were Professors Roy J. Greenfield (2001), Earl "Buzz" Graham (2002), and William B. "Will" White (2002). Greenfield joined what was then the Department of Geology and Geophysics at Penn State in 1968 after receiving his B.S. (1958), M.S. (1962), and Ph.D. (1965) in geophysics from the Massachusetts Institute of Technology, Cambridge, MA, and working for three years as a Staff Member in the Seismic Underground Nuclear Detection Group, Lincoln Laboratories, MIT. He rose through the ranks from Assistant (1968) and Associate (1973) to Professor of Geophysics in 1978. His research interests included exploration geophysics, seismic and acoustic surveillance for military objectives, location of trapped miners, tunnel detection, and data inversion. It is no surprise that he consulted extensively for the U.S. Army Corps of Engineers, Engineering Research and Development Center (USACE ERDC), Hanover, NH. His most cited paper, "Multidimensional maximum-likelihood processing of a large aperture seismic array" outlined an improved technique to monitor underground nuclear weapons tests and small earthquakes. Greenfield advised five M.S. and 14 Ph.D. candidates over his 33-year career.

Earl (Buzz) K. Graham—From Miller's history: "Earl K. Graham's research interests include an emphasis on pressure and temperature dependence of elastic properties on primary earth-forming silicates and oxides and their application to the compositional aspects of planetary interiors; elastic properties of porous ceramics and glasses; experimental synthesis and characterization of high-pressure and high-temperature phases and composites of engineering ceramic materials; experimental and theoretical evaluation of equations of state appropriate for the prediction of the compression of silicates and oxides; and the calculation and evaluation of compositional models of Earth and terrestrial planets in terms of observable geophysical data." He supervised at least five M.S. and five Ph.D. graduate students (the numbers are a minimum because of incomplete data) and served as the Associate Head for Undergraduate Programs from 1996-1999. One of his most cited papers, "Elastic constants of single-crystal forsterite as a function of temperature and pressure", showcased his expertise in experimental mineral physics.

William B. "Will" White worked for 40 years on the Penn State Geosciences faculty (1962-2002) after earning a B.S. degree (Chemistry) from Juniata College and a Ph.D. (Geochemistry) from Penn State. His published papers reflected his broad scientific interests spanning crystal chemistry, infrared and Raman spectroscopy, structure and properties of glass, and phosphors and other optical materials and the more down-to-earth topics of caves and karst, and mine and nuclear

waste land remediation. Over his career White published more than 400 papers in technical journals and authored or coauthored 17 books, earning him fellowship in the AAAS, the Mineralogical Society of America, and the NSS. His most successful paper (cited over 1,000 times) dealt with Raman spectroscopy. His work on karst processes was equally important, but as his biographer said, ((Goldscheider, Baker et al. 2009)), "The first karst hydrogeology paper on the list of his most-cited articles comes somewhere around rank 30. Still, he is often and rightly considered the "Grand Old Man" of cave and karst research in the US, and maybe worldwide." His textbook on the Geomorphology and Hydrology of Karst Terrains, for decades was the standard reference. He supervised at least seven M.S. and 17 Ph.D. graduate students (the numbers are a minimum because of incomplete data).

By 2004-2005, tenure-track faculty numbers had dipped to 29 with the retirements of Professors Shelton Alexander, Peter Deines, Derrill Kerrick, David Eggler and Barry Voight. Alexander joined Penn State in 1969 as an Associate Professor after receiving a B.S. (1956) from the University of North Carolina, Letters of Completion in Geophysics (1957) from the Sorbonne, University of Paris, and an M.S. (1959) and a Ph.D. (1963) in geophysics with a minor in mathematics from the California Institute of Technology. From 1963 to 1966, he taught at the Air Force institute of Technology in Ohio before joining Penn State. His research interests were broad, including seismology, natural hazards, earth structure and dynamics, geophysical signal analysis, remote sensing, planetary science, and geophysical methods applied to exploration for natural resources. Among his 75 peer-reviewed papers, he is most frequently cited for pioneering work on the structure of the core-mantle boundary using diffracted P waves and on the deep structure of continental lithosphere using surface waves. Given his equable and optimistic personality it was inevitable that Alexander would be asked to serve the department as Program Director for Geophysics (1971-1985) and as Geosciences Department Head (1985-1990) and to become a founding board member of the Incorporated Research institutes of Seismology (IRIS) where he played a pivotal role in the creation of the IRIS Data Management Center. He supervised at least 10 M.S. and 22 Ph.D. graduate students (the numbers are a minimum because of incomplete data). In addition, as a Licensed Professional Geologist in Pennsylvania he consulted widely for electric utilities on seismic safety and siting of nuclear power plants.

Peter Deines joined Penn State as a tenure-track Assistant Professor of Geochemistry in 1967, after earning his Geologen Vordiplom at Friedrich Wilhelms University, and M.S. and Ph.D. degrees from what was then the Geochemistry and Mineralogy Department at Penn State. His research centered on the stable isotopes of carbon, hydrogen, nitrogen, oxygen and sulfur in meteorites and Earth's mantle. He was an exacting experimentalist probably best known for his

comprehensive database of the C and O isotope profiles for all types of diamonds and some associated minerals from every kimberlite pipe in southern Africa and dozens more across the globe. This led to his most cited work, "The carbon isotope geochemistry of mantle xenoliths". Deines' unique mixture of attention to detail and sense of duty destined him to an extraordinary level of academic and professional responsibility, including Graduate Program coordinator—first for the Geochemistry and Mineralogy Graduate Program, and then for the merged Geosciences Graduate Program; the University Faculty Senate for a remarkable 24 years, including serving as vice-chair (1989-90) and chairman (1990-91); a member of the University Graduate Council; Treasurer of the Geochemical Society; Chairman of Goldschmidt Conferences in 1988-1990 and Co-Chair in 1991-1992 and 1994-1995; and a long run as editor-in-chief of *Isotope Geoscience*. He mentored at least four M.S. and six Ph.D. graduate students (the numbers are a minimum because of incomplete data), and as his colleague Lee Kump noted[11], "Although Peter taught over ten different courses during his time at Penn State, he'll be best remembered for his course in introductory geochemistry. Meant principally for undergraduates, this course proved indispensable to graduate students who aspired to be geochemists. His patience, persistence, and compassion, married to an effective, comprehensive teaching style, transformed nervous geochemistry neophytes into confident and competent geochemists." In 2021 his contributions to the department were recognized by naming a department lab facility in his honor: *The Peter Deines Isotope Mass Spectrometry Laboratory*, and the establishment of the *Deines Lecture*, given annually by a senior graduate student.

Derrill M. Kerrick received his B.S. degree from San Jose State College in 1963 and his Ph.D. from Berkeley in 1968. After stints as a ski instructor and a two-year lectureship at Manchester University in the UK, Kerrick joined the department in 1969 as an Assistant Professor of Geochemistry. Promotions to Associate and Full Professor followed in 1973 and 1979, respectively. Kerrick joined a Geochemistry and Mineralogy Program strong in igneous petrology studies; his contribution was to extend those theoretical and experimental techniques to metamorphism. He established equations of state for metamorphic fluids and elucidated the kinetics of metamorphic reactions. As increasing atmospheric CO_2 became a major concern, he focused on CO_2 degassing from metamorphic decarbonation and from intrusive and extrusive magmatism. His results are presented in over 60 publications. One of the most cited is his 2001 paper "Present and past nonanthropogenic CO_2 degassing from the solid earth". He also is well known for two Mineralogical Society of America Short Course volumes on contact metamorphism and Al_2SiO_5 polymorphs. Kerrick

[11] https://www.geosc.psu.edu/alumni/stay-connected/issue/20041/geosciences-newsletter-2004

served the department as Chair of the Geochemistry and Mineralogy graduate program from 1978-1983. He supervised at least six M.S. and eight Ph.D. graduate students (the numbers are a minimum because of incomplete data).

David H. Eggler received his A.B. in Geology from Oberlin in 1962 and his Ph.D. from the University of Colorado in 1967, specializing in magma and mantle geochemistry and petrology. His first residence in the department occurred as a Research Associate from 1967 to 1970, after which he accepted an assistant professorship at Texas A&M from 1970 to 1972. He then worked as a staff member at the Carnegie Geophysical Laboratory in Washington, D.C. from 1972 to 1977. Eggler returned to the department as an Associate Professor of Petrology in 1977, becoming a Professor of Petrology in 1985. Many of Eggler's most important manuscripts emerged from this varied experience, as for example, his 1974 paper on the "Effect of CO_2 on the Melting of Peridotite", which was selected as a Benchmark Paper in the 1984 volume "Basalts". He supervised at least three M.S. and seven Ph.D. graduate students (the numbers are a minimum because of incomplete data). His teaching abilities applied across all levels of the curriculum from general education courses (Geosc 20) to required courses in the undergrad major (Optical Mineralogy, Petrology, Field Camp) to graduate courses (P-T-X Phase Equilibria). He served as the department's Associate Head of the Graduate Program from 1983 to 1994, where he showed great prescience in estimating the number of new graduate students who could be financially supported each year.

Next to retire in 2005 was Barry Voight, Professor of Geology and Geological Engineering for 42 years. Voight came to Penn State in 1964 after a 5-year dual-degree program at the University of Notre Dame in geology (1959) and civil engineering (1960), a master's degree in civil engineering from Notre Dame (1961) and a Ph.D. in geology in 1965 from Columbia University. He became a Professor of Geology and Geological Engineering in 1978 with a joint affiliation in the Department of Mineral Engineering. Voight's interests were in structural geology, engineering geology, and rock mechanics, but he soon became focused on the science of rockslides and avalanches. His edited two-volume (1978/1979) *Rockslides and Avalanches* quickly established him as the doyen of mass movement. When Mt. Saint Helens awakened in late 1979, Voight was asked by USGS personnel to review the situation. He successfully predicted a landslide collapse of the mountain's north side followed by a violent eruption. Subsequent research led to his most cited paper, "A method for prediction of volcanic eruptions". By career's end his publications included over 100 papers in peer-reviewed journals and over 15 edited or co-edited books. He is the subject of a cameo in Dick Thompson's book, *Volcano Cowboys*. In between trips to volcanoes Voight taught eight M.S. and 13 Ph.D graduate students how to conduct independent research,

and generations of undergraduates in physical geology, mechanics of geological materials, field geology, and volcanology.

Last to retire in the decade was Roger Cuffey after 40 years on the faculty. Cuffey earned all his degrees at Indiana University, his B.S. in 1961, M.A. in 1965, and Ph.D. in 1966. While doing so he worked as a paleontologist-stratigrapher for the Kansas Geological Survey in 1962 and a geographic pathologist for the Armed Forces Institute of Pathology while he was a Captain in the United States Army from 1965-1967. He joined the department geology/geoscience as an Assistant Professor in 1967, rising through the ranks to Associate Professor (1973) and professor (1979). Cuffey's interests were the recognition and delineation of ancient and modern bryozoans in reefs and reef-building and bryozoan evolutionary lineages. Two fossil bryozoan species were named in his honor: the Late Ordovician bryozoan Cuffeyella arachnoidea from the Cincinnati region and Diplotrypa cuffeyi from Middle Ordovician strata of the Canadian Arctic. His most-cited work was a 1985 Geology article presenting an expanded classification for carbonate reef-rock textures. Although his publication record in refereed journals was modest, he was a consummate educator and mentor. The mainstay of the department's paleontology program, he taught *Historical Geology, Stratigraphy, Paleoecology*, and a general education course called simply, *Dinosaurs*. He supervised 12 M.S. and 10 Ph.D. graduates and innumerable undergraduate senior theses. Never shy from defending his science, he artfully debated Creationist John N. Moore in front of a packed Schwab Auditorium in the early 1970s. He served 10 years on the Treatise on Invertebrate Paleontology advisory committee at the University of Kansas.

Although not faculty, a steadfast behind-the-scenes department leader, Carol Vonada, retired in 2003 after serving for 33 years as Administrative Assistant to (at least) four Department Heads.

ARRIVALS

There is nothing quite like an academic faculty search. The institutional commitment to a successful applicant is usually for upwards of 35 years and for that the department demands that numerous needs be met—disciplinary needs, undergraduate education needs, superstar potential, collegiality, and diversity in all its faces (race, ethnicity, gender identity, age, social class, ethical values, national origin, and political beliefs). The 14 faculty who left the department during the decade of the "aughts" were predominately high temperature geochemists and geophysicists, suggesting that new hires would occur predominately in those areas. But the department's official position was not to "replace" individuals, and therefore by 2001 the department was conducting six faculty searches in the diverse fields of

Geomorphology, Seismology, Carbon Cycle Science (two positions), Ice and Climate, and Geobiology. The first of the new hires were Assistant Professor Christopher House, and Associate Professors Charles Ammon and Chris Marone. House's research interests were in astrobiology and microbial paleontology, specifically by combining genetic studies with direct evidence from the fossil record to find out how bacteria arose and diversified several billion years ago. Ammon's research interests centered in earthquake seismology, seismogram modeling, lithospheric structure, tectonics, and inverse modeling. Marone's research involved laboratory studies of earthquake physics, fault mechanics, friction, constitutive laws, and granular mechanics.

In early 2002 Dr. Klaus Keller accepted a position in carbon cycle science as an Assistant Professor. His expertise lay in investigations of oceanographic, biogeochemical, and economic aspects of the global carbon cycle. His methodological approaches included large scale data analysis, analytical and numerical modeling of bio-geochemical processes, economic simulation, as well as cost-benefit analysis. The Paleobiology position was filled in 2002 by Dr. Peter D. Wilf, a paleobotanist who used fossil plants to investigate ancient ecosystems, biogeography, past environmental change, and the evolution and extinction of plants and plant-insect associations. He emphasized questions with relevance for modern climate change and biodiversity, thus making him a good fit with the established climate change group. And, as already mentioned, Dr. Sridhar Anandakrishnan was hired back to the department to fill the glaciology position vacated by Dr. Todd Sowers. Also in 2002, then department head Rudy Slingerland wished to return to the teaching faculty, thus initiating a search for a replacement. The successful external candidate was Dr. Timothy Bralower, chair of the Department of Geological Sciences, University of North Carolina, Chapel Hill who arrived early in 2003. Although hired as an administrator, Bralower's research dovetailed nicely with the department's emphasis on global change. As a micropaleontologist and marine paleoceanographer he studied the impact of climate change on plankton in the oceans, particularly during mass extinction events.

Two new professors joined the department in 2004. Dr. Jenn Macalady joined geosciences as an Assistant Professor with joint appoints in the Ecology (ICDP), Biogeochemistry (Dual Title), and Astrobiology (Dual Title) Ph.D. programs. She was a microbiologist interested in biological interactions with earth materials using the then-emerging techniques of molecular biology, bioinformatics, and geochemistry. Applications to the earth sciences included sulfur cycling in environments where the geochemistry is similar to conditions on early Earth and possibly on other planets and the microbiology of acid mine drainage. Accompanying Macalady was Professor David Bice to lead an overhaul of the

undergraduate curriculum. Bice was a structural geologist from Carleton College and joined the department as the Associate Head for Undergraduate Programs.

In 2005 there was a university-wide realization of research needs in the hydrologic sciences with monies partially supplied from central administration. Buoyed by these extra funds the department hired two new faculty in hydrogeology: Associate Professor Demian Saffer and Assistant Professor Kamini Singha. Saffer's research interests were focused on the role of fluids in fault zones and the role of clay minerals in fault slip behavior. Singha Click here to enter text.specialized in hydrogeophysics, and specifically the use of electrical resistivity methods in determining fluid flow, all directed towards understanding the processes associated with fluid flow and contaminant transport, aquifer storage and recovery, and bioremediation in shallow aquifers.

As noted above, the petrology program was particularly reduced by retirements. To regain expertise in this field the department hired Dr. Maureen Feineman, whose research combined geochemistry, igneous petrology, and metamorphic petrology to understand the inner workings of subduction zones. The department gained an unexpected additional professor of geosciences when the College hired Dr. Russ Graham, a renowned vertebrate paleontologist, as Director of the Earth and Mineral Sciences Museum.

In 2006 Assistant Professors Matt Fantle and Pete LaFemina joined the department. Fantle's research developed methodologies for measuring Fe isotopes by thermal ionization mass spectrometry and the application of stable isotopes to environmental and paleoceanographic problems and global geochemical cycling. LaFemina's research interests were in plate boundary zones and the integration of geologic and GPS data to observe changes in the Earth's surface across active faults, fault systems and on active volcanoes.

NON-TENURE-TRACK FACULTY

This decade saw a dramatic rise in the number of non-tenure-track faculty. Dr. Tanya Furman continued serving as an Academic Professor, conducting both teaching and research. Dr. Nicholas B. Harris (2002-2004) conducted research in petroleum geosystems before becoming a professor at the University of Alberta. Dr. Todd Sowers shifted from tenure-track to NTT faculty in 2000. Also joining the NTT faculty in 2001 were Dr. Eliza Richardson as Assistant Research Professor and Dr. Lisa Greer as an Assistant Professor of Geosciences. Richardson later became the lead faculty member for a Master of Education in Earth Sciences program. Greer's role as a Geosciences Education Specialist was to help to

develop a new learner centered Introductory Geoscience course and to organize programs to enhance diversity in Geosciences. She and Dr. Peter Heaney were the first college faculty in the country to use a wireless electronic student response system ("clickers") as an integral component of lectures. Three other NTT faculty worked closely with tenure-track faculty: Dr. Richard Brazier, an Assistant Professor at the Penn State Dubois Campus, published in geophysics, Dr. Raymond Fletcher, a structural geologist and mathematical modeler published in structure and geochemistry, and Dr. Dan Seidov, an oceanographer, published in paleoceanography.

CURRICULAR AFFAIRS

UNDERGRADUATE

In the department's November 2000 newsletter to alumni, then department head Slingerland said that undergraduate enrollments for the years 1965, 1970, and 1999 were respectively 130, 190, and 67. Over the decade of the aughts enrollments bottomed out both at Penn State (Figure 6) and nationally (Figure 5). The high numbers of the 1960s-1980s were caused by high hydrocarbon prices, the rise of environmental consulting firms due to the 1972 Clean Water Act, by new requirements for state-certified geologists, and by students avoiding the Viet Nam draft in the 1960s and early 1970s. Low student numbers in the early 2000s were caused by low oil prices during the 1990s, a saturated job market in environmental firms, and a collapse of base metal mining in the U.S. Although the department had long thought of itself as primarily a post-baccalaureate education/research unit, the department worried about the low undergraduate enrollments relative to the large faculty. Its solution was to encourage non-traditional students by creating a new B.A. Geosciences degree in 2000 for those interested in a career in environmental law, planning, and business, and a new B. S. Geobiology degree in 2005 designed to take advantage of the burgeoning field of biogeochemistry and an over-crowded pre-med biology major. The Geoscience B.A. degree program was designed for students who the faculty thought might want a solid overview of modern geoscience but with more flexibility in allied sciences than the Geosciences B.S. degree and without the required senior thesis. It was assumed that graduates wouldn't progress to geosciences graduate school. Both degrees helped but did not substantially grow the department's undergraduate enrollments (Figure 7). Nevertheless, undergraduate numbers slowly rebounded through the decade from numbers so low in 2002 that field school out west was not feasible, to over 80 combined Geosciences and Earth majors in 2008. The rise mirrored the price of a barrel of oil (lagged by a few years) as $10 dollar/barrel oil in 1999 rose to over $70 dollar/barrel oil in the second half of the decade. The rise in oil prices and national fears of U.S. energy dependency on unfriendly nations led to advances in extracting oil

and natural gas from organic rich shales, some in Pennsylvania. As word spread that energy companies were hiring even at the undergraduate level, the number of majors continued to rise.

The decade of the aughts also saw a concerted effort to increase the diversity of department majors. From no women in the Department of Geology in 1921, numbers rose so that by 2005 women made up half of the undergraduate cohort (Figure 6). Also in summer 2006, Professor Andrew Nyblade began teaching a geophysics field course in South Africa as a part of his rapidly growing AfricaArray program, with students participating from several minority-serving institutions (Appendix VI). Two thousand and six also saw the first three students arrive from Fort Valley State University (FVSU) in Georgia to take part in a combined 3-year+2-year dual-degree program. This program was a joint venture between the department and the Cooperative Developmental Energy Program at FVSU. Students in the program conducted three years of coursework with an emphasis on chemistry or math at FVSU, then transferred to Penn State for two years of coursework with an emphasis on geosciences. At the end of the two years, students graduated with two B.S. degrees, one from FVSU in Chemistry/Math, and one from Penn State in Geosciences.

GRADUATE

As the number of undergraduate enrollments dropped from the 1980s to 2000, so too did the number of graduate degrees awarded by the department (Figure). During the decade of the aughts the number of graduate degrees/year gradually rose from 15 to 26 (M.S. plus Ph.D.), in sync with a rising number of undergraduates and faculty members. Because department policy was to support all graduate students with tuition waivers and stipends, graduate numbers were especially driven by faculty success (or not) in obtaining external funding. The new centers, institutes, and multi-instructor programs noted in the next section played a large role in increasing graduate enrollments because they often had hard-wired graduate student stipends.

CENTERS, INSTITUTES, AND FUNDED MULTI-INSTRUCTOR PROGRAMS

The decade was notable for a proliferation of non-traditional research and educational programs, usually externally funded by awards won by a group of faculty with common interests and a snappy acronym. Graduate student support provided by many of these programs contributed to an increase in the number of graduate students between about 2003-2014 (Figure 9). These programs included: Penn State Astrobiology Research Center (PSARC); Biogeochemical Research Initiative for Education (BRIE); Center for Environmental Kinetics Analysis (CEKA); Center for Remote Sensing of Ice

Sheets (CReSIS); Center for Geomechamics, Geofluids, and Geohazards; AfricaArray; Appalachian Basin Black Shales Group (ABBSG). Details about some of these programs are provided in Appendix VI.

EARTH AND ENVIRONMENTAL SYSTEMS INSTITUTE (EESI)

In 2004 The EMS Environment Institute was renamed to the Earth and Environmental Systems Institute (EESI), one of the main research institutes today in EMS and part of what was then the Penn State Institutes of Energy and the Environment.

SHALE HILLS CRITICAL ZONE OBSERVATORY (CZO)

The Earth's surface provides humans with clean water to drink, soil to nurture crops, and materials to construct the built environment. At the same time, this surface – defined as the critical zone to encompass everything from the top of the vegetation canopy to the bottom of groundwater -- changes over timescales of the meteorologist to that of the geologist in ways that we do not understand. As humans change the surface of the Earth, we increasingly need to understand the coupled nature of these inter-related processes. Scientists around the world have banded together to create observatories to understand how this entire critical zone system operates as one entity of inter-related biological, chemical, and physical parts. As part of this effort, the Penn State Department of Geosciences worked with the National Science Foundation and leaders from around the world to start an NSF program that eventually grew to be a $40m program.

As part of this effort, Penn State initiated the Susquehanna Shale Hills Critical Zone Observatory as an NSF-funded environmental observatory with Dr Susan L. Brantley as the director and lead PI. Although the original site was studied since the 1970s by faculty in the College of Agricultural Sciences, new funding as a CZO became available in 2006 and continued through 2020. More than $22m was gleaned for the site from the National Science Foundation, US Dept of Energy, US Dept of Defense, US Dept of Agriculture, National Oceanographic and Atmospheric Administration, and the PA Department of Environmental Protection. This funding promoted science for more than twenty graduate students at Penn State. Of these, 50% were female. During 2008-2011 alone, the CZO funding also supported 26 undergrads from PSU or affiliated institutions (Univ. Puerto Rico, Alabama A&M, Univ. of Tenn., Washington & Lee, Juniata, and Colgate). Of the undergrads, 14/26 were female, 4/26 self-reported as African American, and 6/26 self-reported as Hispanic American. During that same time interval, nine PSU undergrads completed senior theses or gave presentations at national meetings with CZO support. Among others, geosciences faculty participating at the CZO included Susan L. Brantley, Roman DiBiase, Tieyuan Zhu, Kamini Singha, Tess Russo, and Andrew Nyblade.

DEPARTMENT STATURE

In 2006, US News and World Report reported that Penn State's Department of Geosciences ranked 7th among the 100 Ph.D. granting institutions in the U.S. that were surveyed. Areas of excellence included Sedimentary Geology (3rd), Geochemistry (5th), and Hydrogeology (5th). Of course, some of the department's areas of strength such as Earth Systems Science and Astrobiology weren't yet categories in the rankings. The department was 6th in NFS's Research Expenditure Rankings for 2008. The faculty continued to receive numerous honors (Appendix V). One of the more notable was the 2007 Nobel Peace Prize to The Intergovernmental Panel on Climate Change (IPCC). Two faculty from the Department of Geosciences were members of the IPCC—Drs. Richard Alley and Klaus Keller. Alley was a member of Working Group 1 (The Physical Science Basis of Climate Change) and was lead author on one chapter and a contributing author on another. He also served on the writing team for the Summary for Policymakers and the Technical Summary for the 2007 report and testified in front of the Senate on behalf of the IPCC earlier this year. Alley's expertise was vital for forecasting glacial retreat and sea level rise, one of the toughest areas for prediction. Keller, whose expertise included oceanography, biogeochemistry, and economics, contributed to a chapter, "Assessing Key Vulnerabilities and the Risk from Climate Change," as well as serving as an expert reviewer. One of Keller's major research interests was how we can detect critical thresholds in climate change, especially changes in the intensity, or perhaps complete shutdown, of the global conveyor belt.

THE 2010s

The decade of the "tens" was a continuation of the "aughts" for the department. The U.S. economy recovered nicely from the late 2000s financial crisis with low interest rates and inflation throughout the decade. As the global economy boomed, global oil production reached a historic peak of 93 million barrels/day in 2014, and due to the shale boom the United States became the world's largest crude oil producer in 2018, the first time since 1973. Undergraduate majors increased along with production. Department faculty numbers fluctuated around 29.

The decade of the tens was notable for extreme weather events, from heat waves to destructive storms, and scientists were increasingly likely to ascribe the cause to man-induced global warming. CO_2 concentrations rose from 390 to 410 PPM over the decade and the latter half was the warmest five years on record according to the World Meteorological Organization. A record high temperature of 53.7C was confirmed by government meteorologists in Pakistan. The

Greenland Ice Sheet melted seven times faster than it had in the 1990s, on pace with the IPCC's worst-case climate scenario. The decade also saw record-breaking earthquakes. A 7.0 magnitude earthquake hit Haiti, killing between 200,000 and 250,000 people. It was the deadliest disaster in the decade. A 9.0 magnitude earthquake on the down-going plate near Sendai, Japan created a 9 m high tsunami and left 15,893 dead. It was the largest earthquake to hit Japan in 140 years. Over the decade department faculty and students attempted to better understand these natural hazards through research programs focused on climate risk management; major multi-national field campaigns in Antarctica and Greenland to assess the dynamics and drivers of ice movement; studies of active volcanoes in Central America; and international ocean drilling efforts to study plate boundary deformation and earthquakes, as well as many other related research projects.

Developments in science that would impact the department centered on space exploration and genomics. Kepler-22b, the first exoplanet comfortably orbiting within the habitable zone of a Sun-like star was discovered in 2011. Numerous missions to Mars over the decade provided clear evidence that up to one-third of the Martian surface was once covered by an ocean. The Hubble Space Telescope captured what was believed to be a puff of water vapor erupting from the surface of Europa, one of Jupiter's moons. Gene editing became a reality with the gene-editing tool CRISPR-Cas9, now considered one of the most significant discoveries in the history of biology. Advances in recovering DNA from ancient biomolecules allowed scientists at the Max Planck Institute for Evolutionary Anthropology to outline a draft sequence of the Neanderthal genome[12]. Analysis of ancient DNA and collagen revealed anatomical adaptations that skeletal evidence never provided, such as the color of a dinosaur's feathers or how woolly mammoths withstood the cold. The biggest single extinction in Earth's history, the Permian–Triassic extinction event, was convincingly attributed to massive volcanic eruptions 250 million years ago.[13]

Arguably the most significant challenge to the department during the decade was also the most subtle and unremarked upon at the time— the postmodern assault on the scientific method. Department faculty and students rarely talked about their philosophy of science, but their actions indicated they believed the World contained real objects and was governed by physical laws that existed before their knowledge of them. Their job was to seek universal truths about these objects and laws based on observation, measurement, and experimentation. The postmodernist view—deconstructionism—

[12] https://pubmed.ncbi.nlm.nih.gov/20448178/
[13] https://www.nyu.edu/about/news-publications/news/2017/october/scientists-find-evidence-that-siberian-volcanic-eruptions-caused.html#:~:text=A%20team%20of%20scientists%20has,of%20the%20volcanic%20rock%20today

argued that there was no such thing as objective truth; we all exist in our own subjective reality based upon our own unique experience. For postmodernists it followed that if there were no universal truth, then each group had the right to the reality that best suits them. In postmodernism's extreme view of science, DNA, gravity, and other entities aren't real but "arbitrary products of a predominantly white, European, male subculture"[14]. The problem for the department simply put was this: If all truths are equal, who cares what a geosciences department has to say? The trust between universities and a society that paid them to find scientific truths and teach them to their children was broken. This new view of science entered the courtroom in Creationist lawsuits against school districts (e.g., *Tammy Kitzmiller, et al. v. Dover Area School District, et al*.,) which argued that if Intelligent Design was a scientific theory, then it could be legally taught in U.S. public-school classrooms because "scientific theories are socially produced and non-absolute." Climate scientists within the department found their science (and themselves) attacked by postmodern arguments in the "Climate Wars." Critical social justice theorists and ultra-conservatives argued that the observations of the climate hockey stick were just a statement of politics. The adjective "post-truth" became the Oxford Dictionary's 2016 word of the year. How this philosophy with its lack of objective criteria influenced department functions that depend upon objective criteria for fairness (such as faculty hiring and selection of graduate students for free tuition and stipend) remains to be seen.

TECHNOLOGICAL INNOVATION

Changes in how the department conducted its science during the decade were evolutionary—more and better hardware, software, and connectivity. Data storage became cheaper, moved to the cloud, and Big Data took off. The number of internet users surpassed half the world population in 2018. Smartphones became widespread with the advent of 4G connectivity. By the end of the decade major lab renovations in the basement of Deike Building were underway to support the research enterprise. Spurred by NASA support for a new Astrobiology Center led by Professor Freeman, University funding was made available to construct a world-class isotope geochemistry laboratory, new laboratories for sedimentology, stratigraphy and paleontology, a rock prep facility, a remodeled seismic station, and field prep space for the geophysics and ice groups. And new labs for terrestrial paleoecology and crustal petrology were constructed on the fourth floor of Deike, supporting the research programs of recent faculty hires.

[14] https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3463968/

THE FACULTY

At the start of the decade the department website listed 32 tenure-track faculty[15] (one more than in Figure 2) due to the vagaries of counting joint appointments). At the end of the decade the categories had changed on the department website into "Tenure-line and Standing Appointment Faculty" (35 members), "Fixed-term and Graduate Faculty" (9), and "External Graduate Program Faculty" (7). In the tenure-line and standing category were 20 Professors (although one was listed as "Adjunct Research Professor), 5 Associates, and 10 Assistants[16]. These total to three more than shown in Figure 2 because three salaries came from other budgets. Over the decade, the department renewed itself with 10 tenure-track and two fixed-term assistant professors, although it was still sparse in the associate rank. In 2011 Professor Lee Kump replaced Professor Timothy Bralower as Department Head and Bralower returned to the professoriate. Kump would lead the department until 2017 when he was named the seventeenth dean of the College of Earth and Mineral Sciences. Bralower graciously returned to serve as acting department head while an internal search was conducted. Professor Demian Saffer was appointed Department Head in 2018 but left a year later for the University of Texas to become the director of its Institute for Geophysics. The department and dean then selected Professor Andrew Nyblade to be Department Head, a geophysicist with over 25 years in the department.

DEPARTURES

Over the decade five faculty left the department for other institutions and six retired (Figure 1). In 2012 hydrogeologist Dr. Kamini Singha moved to the Colorado School of Mines, and tectonic geomorphologist Dr. Eric Kirby moved to Oregon State. Recognizing the key role of these disciplines, the department was authorized by the dean to search for replacements after the standard one-year moratorium on hiring. In 2015 Dr. James Kubicki resigned to become department head of the Department of Earth, Environmental and Resource Sciences, The University of Texas at El Paso. Tess Russo, Assistant Professor of geosciences hired in 2014 to study hydrologic system responses to environmental change and human use resigned in 2016 to work for the Gates Foundation.

The first to retire in the decade (2013) was Professor Richard Parizek after 50 years of teaching and research at Penn State. Parizek received his B.A. in Geology from the University of Connecticut in 1956, and his M.S. (1960) and Ph.D. (1961) in Geology from the University of Illinois while working as a groundwater and Pleistocene geologist for the

[15] https://web.archive.org/web/20100609223131/http://www.geosc.psu.edu/people/faculty/faculty_aca.php
[16] https://web.archive.org/web/20200929091847/https://www.geosc.psu.edu/academic-faculty/directory

Illinois State Geological Survey and Saskatchewan Research Council. His expertise centered on the hydrogeology of karst, fractured-rock-dominated, and glaciated terranes and the application of hydrogeological and geochemical principles to abatement of pollution in a variety of industrial settings. In 1961 he joined what was then the Department of Geology and Geophysics at Penn State serving as an Assistant Professor (1965-1971), Associate (1971-1997), and Professor of Geology. He also served as an Assistant and Associate Director of the Mineral Conservation Section of Pennsylvania State University from 1969-1985 and was an organizer of the University's Waste Water Renovation Project (the Penn State Living Filter), a 20-year experiment reusing the University's wastewater to irrigate croplands that the University owned. After the passage of the Clean Water Act in 1972 Parizek spearheaded the department's hydrogeology program, teaching 12 different courses throughout his career and supervising an astounding 100 M.S., Ph.D., and D.eD. degrees, and numerous senior theses. He served on innumerable state, federal, and international review boards and task forces, among which was a 1997 Presidential appointment by Clinton to the Nuclear Waste Technical Review Board. Hundreds of proceedings, circulars, and committee reports accompany his numerous articles in refereed journals. In recognition of his outstanding academic career, the Richard R. Parizek Graduate Fellowship in Hydrogeology in the department was established by his student Ronald A. Landon and family, and more than 63 graduates and friends of the Department of Geosciences.

Next to retire (2014) was Professor of Geochemistry Hiroshi Ohmoto after serving 44 years in the department. He earned a B.S. in Geology from Hokkaido University, Japan (1964), and A.M. (1967) and Ph.D. (1969) degrees in Geology from Princeton University, after which he was hired by the University of Alberta, Canada as a Lecturer of Geochemistry. In 1970 Ohmoto joined what was then the Department of Geochemistry and Mineralogy at Penn State, rising through the ranks as assistant (1970-1974), associate (1974-1978), and professor of geochemistry (1978-2014). He served as Director of the EMS College's Ore Deposit Research Section from 1996 to 2009 and Director of the Astrobiology Research Center from 1998 to 2009. Ohmoto held joint appoints at various times with Tohoku University, the University of Tokyo, and as an adjunct professor at 11 more Japanese universities. Ohmoto supervised the research of more than 80 students and postdoctoral colleagues while teaching courses in isotopes, ore deposits, and astrobiology. Early in his career he focused on the geochemistry of hydrothermal systems and the origins of ore deposits, including volcanogenic massive sulfides, banded iron formations, Mississippi Valley-type base metal deposits, and gold and base metal veins. His research employed isotopic methods, aqueous experiments, and extensive field work. This led to a detailed understanding of Kuroko (Massive Sulfide) Type ore deposits as a product of black smokers at ocean spreading centers. Later in his career

he concentrated on the origin of banded iron deposits on the early Earth, leading him to weigh in on one of the most hotly debated problem of geological sciences at the time—the oxygen content of the earth's atmosphere during the Archean.

Professor of Geology Rudy L. Slingerland officially retired in June 2015 after serving 38 years on the faculty as assistant, associate, professor, and department head. He received his B.S. in Geology from Dickinson College, was promptly drafted, and served from 1969 to 1971 in Viet Nam with U. S. Navy Mobile Construction Battalion 3 (the Seabees). He received his master's degree in 1974 and his doctorate in 1977 from Penn State and was hired as an Assistant Professor in the Department of Geosciences in 1977. Slingerland served as department head from 1997 to 2002 and as interim dean for graduate education and research in 2003. Over his career he taught courses in sedimentary geology, earth surface processes, field geology, stratigraphy, and mathematical modeling, and supervised 13 Ph.D. students and 22 M.S. students, as well as numerous senior thesis projects. He authored or co-authored more than 80 publications in refereed journals, and nearly 40 books and book chapters, the most influential of which (he thought) was "*Mathematical Modeling of Earth's Dynamical Systems: A Primer,* co-authored with Lee Kump (2011). His interests spanned from classical stratigraphy to numerical modeling of paleo-oceans, rivers, deltas, and tectonic landscapes. This breadth allowed him to play a critical role in bringing sedimentary geology and geomorphology into a new quantitative era in which prediction and hypothesis testing took the place of descriptive interpretation. In 2013, one of his former graduate students, Roland P. Sauermann and his wife, Debra C. Sauermann, created the Slingerland Early Career Professorship to highlight his work as a scientist, educator, and mentor.

Two thousand-seventeen saw the retirements of Professors of Geosciences Mike Arthur and Terry Engelder after 26 and 32 years in the department, respectively. Arthur grew up in southern California, attending San Bernardino Valley College and later the University of California, Riverside from which he received his B.S. (1971) and M.S. (1974) degrees in geology. He then came east to Princeton University where he received his Ph.D. (1979) in the geological sciences. His dissertation set his life's work: using different ratios of carbon isotopes in stratigraphy to understand aspects of the Earth's climate and environments. From 1979-1981 Arthur worked as a Geologist with the Branch of Oil and Gas Resources, the U.S. Geological Survey where he continued to develop carbon isotope stratigraphy. In 1981 he decided to try his hand as an Assistant Professor of Geology at the University of South Carolina, Columbia, and then as an Associate (1983-1989) and Professor of Oceanography (1989-1990) at the Graduate School of Oceanography, University of Rhode Island. He participated in numerous ocean drilling expeditions and was co-chief scientist of an expedition to the sub-Arctic region,

the Black Sea (a modern anoxic basin), and the Peru margin. Along the way he became an expert in black shales. Arthur came to Penn State in 1991, succeeding Shelton Alexander as head of department and served until 1997. His many initiatives, such as mixing up faculty offices by discipline, promoted a collegiality and an esprit de corps that served the department well. During the shale gas boom in Pennsylvania Arthur helped establish the Marcellus Center for Outreach and Research and served as the first co-director. He was a prolific researcher, publishing more than 190 peer-reviewed papers and book chapters. While at Penn State he taught courses in marine geology, stable isotope geochemistry, and petroleum geosystems, and supervised 17 M.S. degrees, 16 Ph.D.'s, and numerous post-doctoral researchers.

Professor Terry Engelder received his B.S. in geology from Penn State (1968), his M.S. from Yale (1972), and his Ph.D. from Texas A & M University (1973). From 1973 to 1985 he held appointments at Lamont-Doherty Geological Observatory of Columbia University as a Research Scientist, a Senior Research Associate, and a Lecturer at Columbia University. In 1985 he joined the department as an Associate Professor of Geosciences with promotion to Professor in 1990. Engelder's research interests centered on structural geology, geological fracture mechanics, and fluid pore pressure in sedimentary basins, particularly in gas shales. He supervised 12 Penn State Ph.D. dissertations, 14 M.S. theses, numerous senior theses, and authored or co-authored 112 peer-reviewed research papers, 29 book chapters, one book, and co-edited four research volumes. His most cited paper, "Should fracking stop?", co-authored in 2011 with R.W. Howarth and A. Ingraffea, drew upon his major role in developing an understanding of hydro-fracking black shales for natural gas. His 2007 calculation on the potential accessible gas in the Marcellus Shale of the Appalachian Basin landed him in Foreign Policy magazine's "Top 100 Global Thinkers", with an appearance on NPR's 'This American Life' and a TED talk.

In 2017 Research Assistant Donald Voigt retired after serving the department for 20 years in its glaciology field programs, spending many Christmases near the South Pole.

In 2019 Professor Russell Graham, Director, Earth and Mineral Sciences Museum and Professor of Geosciences retired after fifteen years of service to the department. Graham received his B.S. in Zoology (1969) and his M.S. in Geology (1972) from the University of Iowa and his Ph.D. in Geology (1976) from the University of Texas at Austin. From 1981 to 2004 he served as Curator and Head of various departments in the Illinois State Museum and later the Denver Museum of Nature and Science before coming to Penn State in 2004 to oversee the transformation of the college museum into a modern, professional operation. His scientific expertise lay in vertebrate paleontology and Late Quaternary mammalian

biogeography and environments. As a faculty member in the department Graham taught courses in vertebrate paleontology, dinosaur extinctions, and the biotic response to climate change. He (co)-supervised five M.S. and five Ph.Ds. His most acclaimed discovery was finding stone tools used by the Clovis culture at a forest-dwelling mastodon dig in Missouri. The site of the excavation has since been transformed into the Mastodon State Historic Site and State Park. Graham modernized the EMS museum and oversaw the inventory, safe storage, and restorations of much of its vast collection of more than 18,000 geological specimens, thousands of mining safety and other extraction industry artifacts, and numerous mineral industries-related paintings.

ARRIVALS

The department's strategic plan for 2009-2014 listed four programmatic priorities to: "1) Establish the premier research program in Cryospheric Science; 2) Develop a premier research program in Hydrologic Science; 3) Strengthen our program in Energy Geoscience; and 4) Build up the core of our field through strategic hires."[17] The first faculty hire under this plan was Assistant Professor Elizabeth A. Hajek, a sedimentary geologist whose research used the stratigraphic record for reconstructing past landscape conditions on Earth. She strengthened the program in energy geoscience, having interned for three summers with major oil companies and she filled a void in sedimentary geology faculty. In 2013 Dr. Byron Parizek, an Assistant Prof. of Mathematics and Geosciences at Penn State DuBois was appointed to the graduate faculty in the Department of Geosciences at University Park. Along with a history of formal training and fieldwork in glaciology, Parizek's research interests were in numerically modeling of ice-ocean-atmosphere-solid Earth interactions, with particular attention on process understanding of cryospheric dynamics.

In 2014 a new five-year strategic plan was crafted[18] with two faculty hiring goals: "1) Hire a diverse cadre of new faculty in strategic areas who build our expertise in human-induced changes to the global water cycle and other components of the Earth system and in using lessons from the past to inform future decision making; 2) Expand our expertise in solid-earth geoscience to address pressing societal need for geoscientists skilled in sustainable use of natural resources and evaluation of natural hazards and associated risks." Apparently, the plan was easier to implement than articulate, because the department hired nine new faculty members over the next five years under this plan. In 2014 the first hire under Goal

[17] https://web.archive.org/web/20130309035919/http://www.geosc.psu.edu/sites/default/files/documents/Strategicplan-final_000.pdf
[18] https://web.archive.org/web/20150905200646/http://www.geosc.psu.edu/sites/default/files/documents/DeptGeoscStratPlan2014-2019.July2014.pdf

2 was Assistant Professor Christelle Wauthier. Wauthier's research interests focused on the study of natural hazards by means of remote-sensing (InSAR) and geophysical techniques, and particularly on how the "volcano factory" works in diverse geodynamic settings like the East African continental rift, Central America subduction arc, and Hawaiian hot spot. The second hire under goal two was Dr. Roman DiBiase, a tectonic geomorphologist interested in earth surface processes and landscape evolution. His research goals were to better predict landscape responses to changing climate and land use conditions, to mitigate natural hazards, and to understand the dynamic interactions between surface and deep Earth processes. His approach was to develop surface process models satisfying both modern observations and longer-term geologic constraints using fieldwork, topographic and photogrammetric analysis, cosmogenic radionuclides, and modeling. Accompanying DiBiase was Dr. Erin DiMaggio, a sedimentary geologist and stratigrapher hired as a Research Associate in the department. Her research provided a context for paleontologists and archaeologists studying human origins in Afar, Ethiopia by interpreting ancient depositional environments and mapping the complex rift deposits. The fourth hire in 2014 (directed towards goal 1 of the strategic plan) was Dr. Tess Russo, a hydrogeologist interested in water management and sustainable development. Russo left Penn State in 2016.

Three new assistant professors of geosciences joined the department in 2016, all directed towards fulfilling Goal 2 of the Strategic Plan—Drs. Bradley Foley, Andrew J. Smye, and Tieyuan Zhu. Foley was a mantle dynamicist interested in the evolution of the Earth and other rocky planets, particularly plate tectonics and its causes. He used a range of theoretical models from global scale numerical models of mantle convection to simple box models of planetary evolution. Dr. Andrew J. Smye's research combined field observations with theoretical studies to determine the chemical and physical evolution of the continental crust and uppermost mantle. The third new Assistant Professor in 2016 was Dr. Tieyuan Zhu, a geophysicist who used seismic data and ground-penetrating radar to study near-surface geology associated with environmental and energy problems.

In 2017 one new Assistant Professor joined the department, Dr. Julie Cosmidis, a biogeochemist who focused on how microbes control the formation of minerals in fluids and sediments. Dr. Sarah Ivory, another Strategic Planning hire in the global water cycle, joined the faculty as an Assistant Professor in 2018. Ivory identified as an ecohydrologist who used fossil pollen records to better understand past ecosystem change. The last new hire in the decade (2019) was Dr. Jesse R. Reimink, a petrologist who integrated petrology, isotope geochemistry, and new mass spectrometry techniques to answer fundamental questions about when and how the continental crust formed.

NON-TENURE-TRACK FACULTY

Four NTT faculty joined the department this decade. Dr. Erin DiMaggio (2014) became an Assistant Research Professor with interests in sedimentary geology and the timing and geologic setting of early human evolution. In 2015 she became the PSU Program Manager for the Pennsylvania Space Grant Consortium. Dr. John Hooker joined the department in 2017 as a lecturer and conducted research in structural geology and left for a tenure-track faculty position at University of Incarnate Word in 2020. Dr. Allison Baczynski joined the NNT faculty in 2019 as an Assistant Research Professor and Manager of the Isotope Ratio Mass Spectrometry Lab. Dr. Joshua Garber joined in 2018 as an Assistant Research Professor with interests in petrology and plate tectonics.

CURRICULAR AFFAIRS

UNDERGRADUATE

In 2010 then-department head Timothy Bralower wrote in his annual alumni newsletter that the number of undergraduate student majors was holding steady at about 118 majors (112 as reported in department records; see *Figure 3*). Time-averaged numbers would rise very modestly through the decade to 120, or about four per faculty member. Student demography continued the changes started in the previous decade such that the number of undergraduates identifying as female would about match the number identifying as male by the end of the decade. This trend would continue into the next decade as the New York Times reported in 2023: "There are close to three women for every two men in college in this country…" "Most small liberal-arts colleges are close to 60 percent female, and the discrepancy is even more pronounced at community colleges and historically Black colleges and universities."[19] Bralower also reported in 2010 that general education credit hours had increased to over 14,200 per year. Said another way, this is equivalent to each of 32 tenure-track faculty teaching one four-credit course per year to 111 students.

Three Undergraduate Program Heads provided leadership during the decade: Dr. David Bice finished a seven-year term in 2012 to be succeeded by Dr. Peter Heaney (2012 to 2016), and Dr. Maureen Feineman (2016-2022). Under their guidance, and facilitated by Dr. Lee Kump, newly appointed Department Head in 2011, a high-tech active-learning classroom and student visualization laboratory was constructed on the second floor of Deike Building in 2012 to facilitate

[19] https://www.nytimes.com/2023/09/08/magazine/men-collegeenrollment.html#:~:text=Declining%20male%20enrollment%20has%20led,policy%3A%20affirmative%20actio%20for%20men

new modes of teaching and learning as understood at the time. The classroom and lab promoted project- and problem-based learning experiences by providing flexible seating to emphasize teamwork, multiple projectors controlled by individual groups, and plenty of space for project materials, maps, and even rocks.

The department always attempted to identify emerging societal needs and modify its programs to meet them. Towards this end a new Earth Science and Policy B.S. degree was initiated in 2010. This multidisciplinary program combined geoscience and geography with political science, economics, and public policy with the goal of training students to enter the field of climate, energy, and earth science policy. New capstone courses developed for the program included Modeling the Earth System and Geoscience Risk Analysis. The degree included climate change, water and land use, and energy options that allow students to specialize and it required a summer internship, with a government or private enterprise in the general policy area, typically taken in the student's Junior year. The degree was later modified to include more public policy courses, reduced science requirements, and modified options. Graduates were expected to either enroll in a graduate program, attend law school, or find employment in the policy realm in government and private research, including in the growing field of climate risk. Interest in the major steadily rose through the decade (**Error! Reference source not found.**). Also, an Earth Sustainability Certificate and an Earth Sustainability Minor were initiated in 2015 with funding from the NSF Integrate Center. The Earth Sustainability Certificate was offered through the World Campus and at University Park and included a selection of four of five online 100-level courses in the areas of climate, energy, water, food and coastal hazards and policy. The minor, offered at University Park, included the same 100 level courses, Modeling the Earth System, and an additional 400 level course.

GRADUATE

Graduate student enrollments over the decade continued their decline (Figure 9). The cause of the decline almost certainly was a reduction in teaching and research assistantships. As mentioned before, the department only admitted as many graduate students as could be supported by the faculty. Fewer teaching assistantship stipends were awarded to the department as other departments in the College increased their undergraduate student credit hours. Some intermediate years of fewer faculty also might have contributed, although the total number in 2020 was the same as 2010 (Figure 2). The decline in graduate students certainly wasn't for a lack of applicants; the department continued to take fewer than 20% of those applying. And it also wasn't for a lack of a good sales pitch. The department website in May of 2011

boasted[20]: “Graduate student life…is engaging, with frequent seminars, lab group meetings, field trips, and social events. Annual faculty-student softball games and the "Entropy" party each spring offer ample opportunity for more casual interaction with faculty.” As noted, the three most enduring communal activities in the department were an Annual Geosciences Graduate Student Colloquium, an Annual Department Fall Picnic, and an Annual Spring student-led party called “Entropy.” The colloquium was a student-organized annual event that allowed students to show their colleagues what they had been researching, to practice for national meetings, and to improve their speaking skills. The best presentations as judged by the faculty received prizes and the first-place awardee in the category “oral presentation by a post-comprehensive Ph.D. student” was invited to give the Peter Deines Lecture to the department the following academic year.

The Annual Department Fall Picnic was entirely a faculty-staff-graduate student affair held for many years at the civil engineering lodge at Stone Valley. Families were included and for decades Professors Peter Deines and David Eggler barbecued chicken for everyone within sight of kegs of beer and continuous volleyball games. A more serious sporting event the day after the picnic pitted graduate students versus faculty. The sport morphed from soccer matches in the 1970s (which the faculty usually won by virtue of its international membership) to softball games (which the graduate students usually won by virtue of their youth). During the 1980s there even was a geosciences ice hockey team (the “GeoHabs”) of undergrads, grads, and a few faculty that competed in the town adult Nittany Hockey League (the “NHL”). As the university and department became more risk adverse, the beer and the sporting events died.

The department’s annual Entropy Party has been held since 1963, making 2013 its 50th anniversary (Figure 10). It has always been a graduate student-faculty affair modeled after the USGS Pick and Hammer Club shows, with spouses, alcohol, and dancing. During the 1960s and 1970s graduate students presented skits lampooning life in the department, sometimes pointedly; starting in the 1980s the faculty also were expected to present. By 2010 the live skits had been replaced for the most part by video shorts of variable cinematic quality but still effective messaging, although the tone softened through the decades.

[20] https://web.archive.org/web/20110520103459/http://www.geosc.psu.edu/graduates

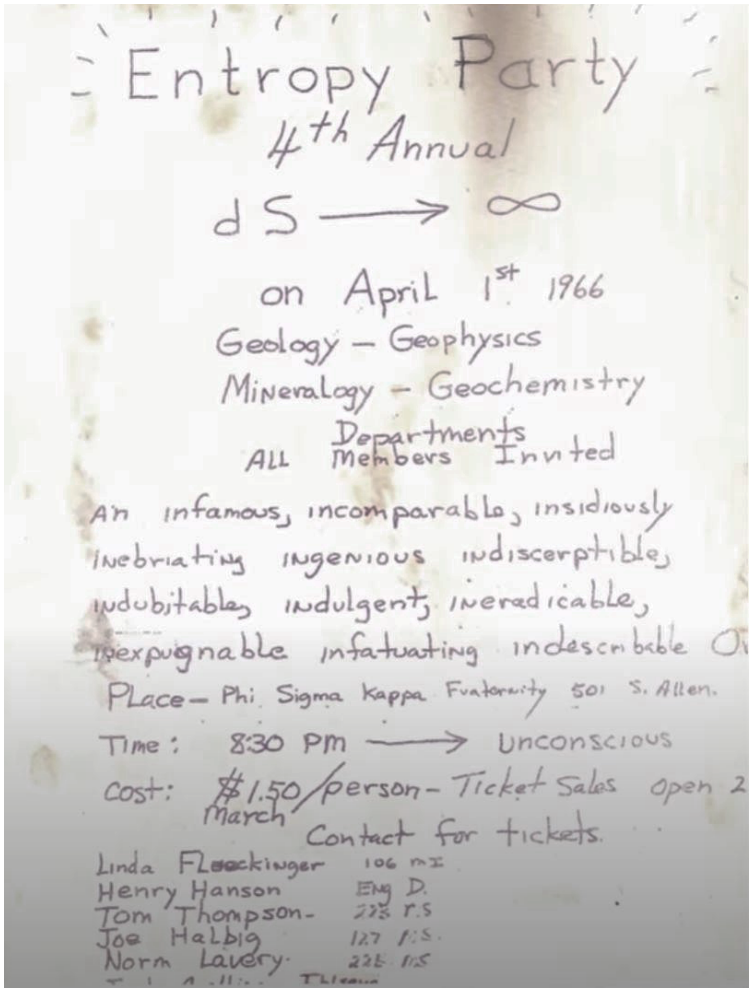

Figure 10. Mimeographed poster advertising the 1966 Entropy Party. It was a joint affair between the two departments that would later merge to become the Department of Geosciences.

In 2012 a new Petroleum GeoSystems Initiative (PGI) was created to help graduate students prepare for careers in the hydrocarbon energy industry. The premise was that interdisciplinary scientists and engineers trained in problem-based, collaborative research would be tomorrow's industry leaders. Students were organized into a team consisting of geologists, geophysicists, and geochemists supported primarily by industry fellowships. They experienced a required curriculum consisting of common courses, cross-training courses, and disciplinary depth courses, including during the spring of their second year, required participation in AAPG's Imperial Barrel Award Program (IBA), the annual basin/prospect evaluation competition for geoscience graduate students from universities around the world. The program built on an earlier successful program started in the late 1990s by Dr. Peter Flemings.

CENTERS, INSTITUTES, AND FUNDED MULTI-INSTRUCTOR PROGRAMS

The 2010's saw a continuation of many of the center programs started in the aughts, including Penn State Astrobiology Research Center (PSARC), the Center for Geomechamics, Geofluids, and Geohazards, AfricaArray, and the Appalachian Basin Black Shales Group (ABBSG). One new program, the Shale Network, was primarily support by the Earth and Environmental Science Institute, but also involved many faculty in the department.

DEPARTMENT STATURE

The faculty continued to receive numerous honors (Appendix V). The decade saw the number of National Academy of Science members swell to four, more than at any time in the department's history. In 2010 US News and World Report ranked the department 6th among Earth Sciences programs, 1st in environmental science, 2nd in geochemistry, 3rd in geology and 8th in paleontology. The 2014 department website announced that the same poll ranked us 2nd in Environmental Sciences, 1st in Geology, 2nd in Geochemistry, 6th in Earth Sciences, and 8th in Paleontology.

THE 2020s

The start of the 2020's was marked by the covid-19 pandemic, followed by a period of significant budget uncertainty as a new university president implemented a budget allocation model unfavorable to the College of EMS. In March 2020, as the pandemic hit, the University shifted to a completely remote operating mode. All classes were moved online, staff and faculty began working from home, and access to buildings was restricted, expect for labs with ongoing, time-critical experiments. Remote teaching and work continued through spring 2021. In fall 2021, students came back to campus, with mask-wearing in buildings required into spring 2022.

The impact on the department was notable, and in many ways the department in 2024 was still recovering some two plus years after the pandemic was declared over in the public's mind. The forced isolation and lack of community engagement resulting from the pandemic took a toll on the mental and emotional wellbeing of just about everyone, but perhaps most notably the students. Mental health issues within both the undergraduate and graduate student populations posed significant challenges to student success. Research productivity dropped substantially, as travel for field work was not permitted or only possible locally, and most labs were shut down. The lack of access to research infrastructure and field sites was particularly hard on junior faculty.

On a more positive note, a major change in the administrative structure of the department was made in 2020 with the establishment of a Diversity, Equity and Inclusion (DEI) program in each EMS department. Prof. Liz Hajek was appointed the inaugural Associate Head for DEI programs, and a new DEI program committee, with faculty, staff, postdoc, and student representation, was formed.

In 2022-2023, just as the department began getting back to its "old self", a new university president implemented a budget allocation model putting EMS on a path to a 25% budget reduction over a period of six years, while at the same time taking away reserve funds the department had saved for supporting future faculty hiring. Nevertheless, with support from then Dean Kump and the Provost, the department found a way to continue hiring into the 2023-2024 academic year, with the understanding that future faculty hiring, even as faculty retired, would be curtailed because of budget reductions. Indeed, in the early 2020's a significant number of new assistant professors were hired, marking yet another generational change in the faculty.

THE FACULTY

Retirements towards the end of the 2010's left several faculty positions vacant. These open positions, plus a few positions vacated by departing faculty, enabled a renewed focus on hiring. As in previous decades, an emphasis was placed on growing the faculty in strategic areas while also addressing the needs of two-career families. In spring 2020, a new five-year strategic plan was developed and implemented that guided hiring decisions. In addition to filling core areas created by the retirements of Slingerland, Arthur and Engelder, plus the move of Kump to the Dean's office, the strategic plan called for hiring in the board area of GeoRisk (natural hazards, ice, climate risk and decision making), as well as in critical minerals and planetary science.

DEPARTURES

In 2020, Julie Cosmidis left for a faculty position at Oxford and Todd Sowers retired. In 2022, Klaus Keller moved to Dartmouth for an endowed faculty chair, Peter LaFemina moved to Germany, and James F. Kasting retired. Kasting served for 35 years on the faculty as an Associate Professor of Geosciences and Meteorology (1988-1993), Professor of Geosciences and Meteorology (1994-2002), Distinguished Professor (2003-2012), and Evan Pugh Professor (2013-2022). Gowing up in Huntsville, Alabama near the Marshall Space Flight Center set his career trajectory. He received an A.B. in chemistry and physics from Harvard University in 1975, and then moved to the University of Michigan for an M.S. in

physics and atmospheric science (1978) and a Ph.D. in atmospheric science (1979). A post-doctoral fellowship at the National Center for Atmospheric Research and at NASA Ames Research Center led to a position as a Research Scientist in the Space Science Division at NASA Ames from 1983-1988. By 1988 Kasting was a leading expert in atmospheric evolution, planetary atmospheres, and paleoclimates; consequently, he was a perfect fit for Penn State's growing Earth System Science Center. Dr. Kasting's investigations of planetary carbon dioxide and other atmospheric gases—oxygen, methane, nitrous oxide—were guided by one central idea: to detect habitable worlds outside our solar system while providing insight into the evolution of life on early Earth. Along with 22 M.S. and Ph.D. candidates and numerous post-doctoral students and colleagues, he published over 200 scientific papers reflecting this focus, as for example his two most cited papers: "Habitable zones around main sequence stars" and "A negative feedback mechanism for the long-term stabilization of Earth's surface temperature." These ideas were further amplified in three books: The Earth System (co-authored with Penn State faculty Lee R. Kump and Rob G. Crane as a textbook for undergraduates), How to Find a Habitable Planet, and Atmospheric Evolution on Inhabited and Lifeless Worlds (co-authored with D. C. Catling). Kasting, along with EMS colleagues Kump and Crane, developed arguably, the first undergraduate course of its kind to address the issues of global change from a true Earth systems perspective. This later was expanded into an EMS Earth Systems minor. In recognition of these fundamental contributions Kasting served on numerous NASA, NRC, and AAAS review panels, committees, and working groups.

ARRIVALS

Between 2020 and 2023 the department welcomed eight new tenure-line faculty. In fall 2020, three new Assistant Professors arrived. Dr. Kim Lau, an isotope geochemist who researched the causes and consequences of ocean anoxia and oxygenation in Earth's history, was hired together with Dr. Brian Kelley, a carbonate sedimentologist, whose research interests ranged from modern marine science to the co-evolution of Earth's environment and life on geologic time scales. Dr. Miquela Ingalls, a sedimentary geochemist whose research combined field geology, petrography, and stable isotope geochemistry to improve the use of chemical sediments in tectonic and paleoenvironmental reconstructions, also joined the faculty as an Assistant Professor.

In 2022, Drs. Ben Cardenas, Antonia Hadjimichael, Tushar Mittal, and Anastasia Piliouras joined the faculty as Assistant Professors. Cardenas, a sedimentologist and planetary scientist, used a wide array of approaches to understand the evolution of ancient sedimentary landscapes, both on Earth and Mars. Hadjimichael, an environmental data scientist,

specialized in interdisciplinary approaches to address water resources planning, and more broadly, human-environment interactions. Mittal, a planetary geophysicist, used an array of observational and computational approaches to understand how the environment and ecosystems on Earth and other planetary bodies evolve through time. Piliouras, a sedimentologist and geomorphologist, used physical experiments, modeling, field work, and remote sensing to better understand the morphodynamics of fluvial, deltaic, and coastal systems, and interactions between vegetation, hydrology, climate, and surface processes.

In 2023, Dr. Rachel Housego, a hydrogeologist, joined the faculty as an Assistant Professor. Housego's research focused on the interactions between surface water forcings (e.g. waves, currents, tides, surge), climate forcings, morphological evolution, and groundwater dynamics which act on a broad range of spatial and temporal scales throughout the hydrosphere.

NON-TENURE-TRACK FACULTY

Four non-tenure line faculty joined the department between 2020 and 2023—Drs. Chris Boxe, Max Lloyd, Isabell Fendley, and Chris Widga. Boxe, who's expertise was in atmospheric and environmental geochemistry, was hired as an Associate Research Professor but left for a tenured associate professor position at Howard University in late 2022. Lloyd, an isotope geochemist who used geochemical tools to tackle unresolved questions regarding surface and near-surface processes on Earth, was hired as an Assistant Research Professor in 2020 and in 2023 moved to a tenure-track assistant professor position. Fendley, an environmental geochemist who started on the faculty in 2023 as an Assistant Research Professor, studied volcanic eruptions and the climate and environmental change they have caused throughout Earth's history. Widga also joined the faculty in 2023 as a Research Professor and Director of the EMS museum. Widga's research focused on Pleistocene mammals.

CURRICULAR AFFAIRS

UNDERGRADUATE

The number of undergraduate majors remained fairly constant over the early 2020's (Figures 6 and 7), in spite of declining enrollments in the geosciences nationally (Figure 5). In 2022, Dr. Chuck Ammon took over as Associate Head for Undergraduate Programs from Dr. Maureen Feineman and in 2023, Dr. Don Fisher, after 25 years as Field Camp director, stepped down and Dr. Roman DiBiase was appointed the new director.

Only a few changes were made in the undergraduate program, mostly to address perturbations to teaching and student wellbeing brought on by the covid-19 pandemic. Many students found online learning difficult, particularly from faculty forced to quickly move course material online with little to no warning, preparation, or experience in delivering online education. The challenges student faced in learning course material became apparent when students returned to the classroom in fall 2022 having forgotten now to study and focus. Many students had to relearn how to learn. Perhaps one of the greatest challenges in teaching during the pandemic was replacing field trips, including field camp, with virtual field exercises. The inability to take students to the field during the pandemic robbed them of foundational experiences throughout the undergraduate curriculum.

GRADUATE

In 2022, Dr. Don Fisher took over as Associated Head for Graduate Programs from Dr. Mark Patzkowsky. Similar to the undergraduate programs, there were few changes in the graduate programs during the early 2020's, other than those imposed by remote work during the pandemic. The number of graduate students remained fairly constant until 2023, when a smaller cohort of incoming students arrived resulting from a reduction in the support for teaching assistantships (Figure 9).

CENTERS, INSTITUTES, AND FUNDED MULTI-INSTRUCTOR PROGRAMS

In 2022, Dr. Susan L. Brantley stepped down as Director of the Earth and Environmental Systems Institute, after 19 years as its leader. Dr. Alan Taylor served as interim director until new director was appointed in 2023. There were few other notable changes to centers and institutes through the early 2020's.

DEPARTMENT STATURE

The early 2020's was a period of continued national and international recognition for the department. The 2023 US News and World Report of Earth Sciences graduate programs ranked Penn State graduate programs #3 in environmental sciences, #4 in geochemistry, #7 in Earth Sciences, #9 in geophysics and seismology, and #10 in geology. Notably, this was the first time geophysics obtained a top 10 ranking. Other ranking systems also placed the department in the top-tier, including the 2024 World University Rankings by London-based QS, which ranked the department #17 in Earth and marine sciences, #21 in geophysics, and #23 in geology. The strong academic stature of the department continued to be reflected in the number of faculty awards received (Appendix V).

DIVERSIFICATION OF THE DEPARTMENT

Like most geoscience departments in the U.S.A., the tenure-line geosciences faculty at Penn State has been comprised predominantly of Caucasian males. Although records may be incomplete from 1910 to 1970, it appears that the only non-Caucasian on the faculty was Dr. Rustum Roy, a physicist and world-renowned expert in material sciences. Roy, born in India, was a member of the Department of Geosciences for a period of time starting in 1950. As a specialist in ceramics, Dr. Roy eventually became a member of the Materials Sciences and Engineering department and the first Director of the Materials Research Laboratory at Penn State. In 1970, Dr. Hiroshi Ohmoto, a native of Japan, joined the faculty. In 1978, Dr. Antonia Lasaga joined the faculty as a geochemical kineticist (he left the university in 1985) and in 2020, Dr. Chris Boxe joined the department (he left the university in 2022). In 2024, the fraction of the department tenure-line faculty derived from under-represented minorities (URM) remained low: within a tenure-line faculty of 33, the number of URM tenure-line faculty was five (one Hispanic American, four Asian/Asian American/Pacific Islanders).

While the number of women on the tenure-line faculty was also very low in the early decades (zero female faculty before 1985) (Figure 11), the number of women in the Department of Geosciences increased much more rapidly than the increase in faculty derived from URM after 1985. Dr. Susan L. Brantley joined the faculty in 1986 and remained on the faculty through retirement in 2024 (38 years). Brantley was the only female tenure-line faculty for five years (until 1991) when Dr. Katherine Freeman joined the department. The chronology of faculty and the first female faculty member in context can be seen by comparing Figures 1 and 11.

The original two women faculty (Brantley, Freeman) were eventually joined on the faculty by their spouses (Dr. Andrew Nyblade (1994) and Dr. Mark Patzkowsky (1992), respectively). This pattern opened the door to future such paired hires into the department (some of which are mentioned previously).

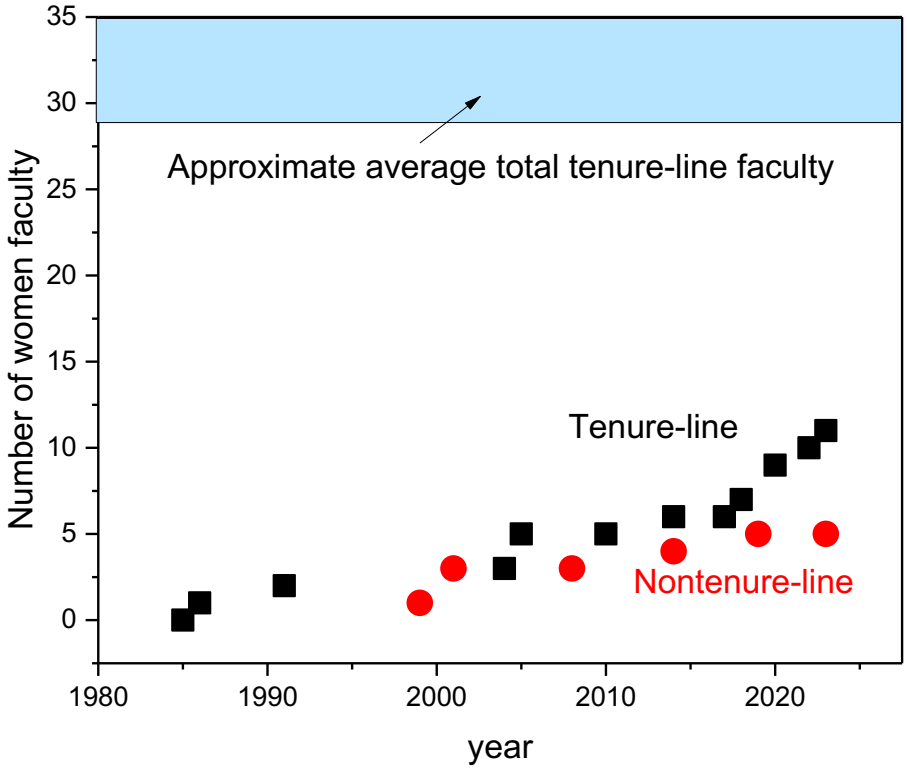

Figure 11. The growth in number of female tenure-line and nontenure-line faculty each year in the Department of Geosciences at University Park. As comparison, a rough estimate of the average total number of tenure-line faculty, which varied from year to year, is plotted as the blue box. In 2024, 11/33 of the tenure-line faculty were female and 5/7 of the nontenure-line faculty were female.

The rate of hiring of female faculty increased in the years following 1991, although many were hired into NTT positions and many of the female faculty also left the university. Dr. Tanya Furman joined the department in 1998, followed by Dr. Jennifer Macalady (2004), Dr. Maureen Feinemann (2005), Dr. Kamini Singha (2005, left the university in 2012), Dr. Elizabeth Hajek (2010), Dr. Erin DiMaggio (2014), Dr. Tess Russo (2014, left the university 2016), Dr. Christelle Wauthier (2014), Dr. Julie Cosmidis (2017, left the university 2021), Dr. Sarah Ivory (2018), Dr. Allison Baczynski (2019), Dr. Miquela Ingalls and Dr. Kimberly Lau (both joined in 2020), Dr. Antonia Hadjimichael and Dr. Anastasia Piliouras (both joined in 2022), Dr. Isabel Fendley and Dr. Rachel Housego (both joined in 2023). As of 2024 (before the retirements of Brantley and Marone), the fraction of women tenure-line faculty in the department was 33% (11 out of 33). The fraction of women as nontenure-line faculty in 2024 was 71% (5/7).

In contrast to the faculty, the student population in 2024 included a higher proportion of women (Figures 6 and 9). To put this into context, we turn to unpublished notes on the history of women in the College of EMS by Claire Cleveland, a

graduate student who worked within the department. According to Cleveland, women were first admitted into the "College of Pennsylvania" in 1871. A BA thesis title by Edith Bartleson, "Petrography of Black River Limestone in Bellefonte PA", may indicate that Bartleson was the first female to complete a thesis or a B.A. degree in Geosciences, or at least, in the College of EMS. Another very early B.S. thesis, "Application of aerial photographs to the geologic mapping of the Julian area" was completed by Selma Moses in 1947. The first woman to earn a Ph.D. in Geosciences at Penn State, again according to Cleveland, was in the 1960s (Shirley Fonda, working with Roger Cuffey). Between 1890 and 1990, more than 1000 women had matriculated in the College of EMS. In 1991, about 25% of all undergraduate and graduate students in the College of EMS were female.

According to Cleveland, "EMS was slow to recognize the need to provide resources and support systems to ensure that women and traditional American minorities (African American/Blacks, Hispanics and Native Americans) would be successful." In 1996, Josie Herrera was appointed as Director, Diversity Enhancement Programs for the College. Today, as summarized earlier in this document, each department within the college has an Associate Head for Diversity (in 2024 this was Dr. Elizabeth Hajek in the Department of Geosciences). The Department of Geosciences in 2024 reported 10% of undergraduate students and 15% of graduate students were URMs. One of the main goals of the department over the decades was to continue to diversify both its student and faculty ranks.

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REFERENCES

Anonymous (1988). https://catalog.libraries.psu.edu/catalog/80404. T. P. S. University. University Park, PA.

Arthur, M. A. (1997). "Departmental Review: Geosciences." Earth and Mineral Sciences Bulletin **66**(1): 9.

Barron, E. J. (1988). "The Earth System Science Center." Earth and Mineral Sciences Bulletin **57**(3): 44-48.

Cleveland, C. (unpub.) "History of Women in the College of Earth and Mineral Sciences".

Dutton, J. (1993). "From Energy to Environment." The Earth and Mineral Sciences Bulletin **62**: 26.

Goldscheider, N., et al. (2009). "William B. White and Elizabeth L. White (USA): their contributions to karst hydrogeology discussed in an interview." Hydrogeology Journal **17**(2): 261-263.

Graham, E. K. and C. P. Thornton (1981). "Geosciences at Penn State -Development, Current Status, and Future Prospects." Earth and Mineral Sciences Bulletin **50**(5): 49-52.

Howell, B. F. (1988). "Some Thoughts on the Development of Geosciences at Penn State." Earth and Mineral Sciences **57**(3).

Howell, B. F., Bates, T. F., and Osborn, E. F. (1988). A History of the Geosciences at Penn State. T. P. S. University. University Park, PA.

Miller, E. W. (1992). The College of Earth and Mineral Sciences at Penn State, Pennsylvania State University Press.

Riding, J. B., et al. (2016). "A biography and obituary of Alfred Traverse (1925–2015)." Palynology **40**(2): iii-xi.

Schmalz, R. F. (1969). "Deep-water evaporite deposition: a genetic model." AAPG Bulletin **53**(4): 798-823.

Thornton, C. P. (1990). "The New Undergraduate Program in Geosciences." The Earth and Mineral Sciences Bulletin **59**: 31-32.

Thornton, C. P. and O. F. Tuttle (1960). "Chemistry of igneous rocks--[Part] 1, Differentiation index." American Journal of Science **258**(9): 664-684.

APPENDICES

APPENDIX I: A HISTORY OF THE GEOSCIENCES AT PENN STATE UP TO 1988

APPENDIX II: GEOSCIENCES THESES COMPLETED 1916 TO 2024

(Data from an Excel spreadsheet maintained by the Office of the College of Earth and Mineral Sciences, The Pennsylvania State University; March 2024)

APPENDIX III: ORIGIN AND HISTORY OF THE HYDROGEOLOGY /ENVIRONMENTAL GEOLOGY PROGRAM AT PENN STATE

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APPENDIX I

A HISTORY OF THE GEOSCIENCES AT PENN STATE

On the Occasion of the 75th Anniversary of the Department of Geosciences, 1988

College of Earth and Mineral Sciences

The Pennsylvania State University

PREFACE

This volume contains three brief contributions dealing with the history of the geosciences at Penn State: a summary history that is based largely on a paper by B. F. Howell that will be published in its entirety in an upcoming issue of Earth and Mineral Sciences, and two anecdotal accounts of some aspects of that history, one by T. F. Bates ('Geology Department Recollections') dealing with the 1940's and the other by E. F. Osborn on 'The Deike Building -- Home of the Geological Sciences'.

GEOSCIENCES AT PENN STATE

Geosciences has been an integral part of Penn State's educational and research program from the beginning. The Pennsylvania State University, known at its inception as the farmers' High School, opened for its first class in 1859. Evan Pugh, the first president, also had the title of Professor of Chemistry, Scientific and Practical Agriculture and Mineralogy. Although Dr. Pugh was committed to the emphasis of agriculture in the new institution's curriculum, he also believed that the school should provide sufficient breadth in its course offerings to meet the needs of Pennsylvania industry in general. President Pugh gave high priority to the study of geology and mineralogy. His microscope and other research and instructional

equipment are on display in the College Museum. There were only five other faculty. A single curriculum for all students is listed in the catalog for 1861, the year in which his first class graduated. It included programs of study in geology .and paleontology and in physical geography and meteorology. All students were required to write a thesis to graduate. The theses were prepared jointly by pairs of students. There were 17 students in the class, but six did not graduate: four because of illness and two because they left school two months before the close to join General Sherman's Bodyguard. The eleven students who graduated produced six dissertations to meet graduation requirements.

Five of the six were in each case the work of two students, 'concentrating upon a single dissertation'. Of the six dissertations, three were as follows: 'On the Limestones of Nittany Valley', by J. W. Eckman and C. A. Smith. 'On the Iron Ores of Nittany Valley' by J. D. Isett and J. N. Banks, 'On the Slags of Iron Furnaces and the Residual Products Obtained in Converting Pig into Bar Iron' by L. C. Troutman and C. E. Troutman. The other theses were on fertilizer, corn, and local plants. These titles indicate that two of the research projects were on geological subjects, and a third was on products of high temperature reactions among minerals; hence, six of the eleven students graduating did their research on projects in fields of geological science.

Three more geological theses are listed in the 1863 Catalog, after which the listing of student thesis topics was suspended until 1892. Geology and sometimes also paleontology and mineralogy continue to be listed among the topics taught in every catalog.

After the death of President Pugh in 1864, responsibility for teaching geology appears to have been taken over by biologists (Table I), The 1867 Catalog lists Henry James Clark as Professor of Zoology, Botany and Geology. He was replaced by J. Trimble Rothrock, Professor of Human Anatomy and Physiology, Botany

and Geology, and later by William A. Buckhout, Professor of Geology, Zoology and Botany (except in 1871 when Buckhout was Professor of Botany, but the faculty also included Albert H. Tuttle as professor of Geology and Physiology). In 1879-80, the Catalog lists the chair in 'Geology and Zoology' as vacant. It was filled a year later by Professor Addison L. Ewing. One may suppose, considering the other interests of the professors who taught the geology courses, that they emphasized paleontology, which was in a period of world-wide ascendancy during the latter half of the nineteenth century.

Mineralogy may have been taught after Dr. Pugh's death by the Professor of Chemistry. A Department of Geology and Zoology was established in 1882, according to W. F. Dunaway's (The Pennsylvania State College History 1946). In 1889, Franklin E. Tuttle joined the faculty, first as Instructor of Chemistry and Mineralogy, and later as Assistant Professor. The catalogs do not specify who taught each course.

In 1893, a new program in Mining Engineering was added to the eight previously established programs of study in the School of Engineering. The 1893-4 Catalog (p. 85) states that 'this course aims to. fit students for practical work in Mining, Geology and Metallurgy. Magnus C. Ihlseng was added to the faculty as Professor of Mining Engineering and Geology, and head of the department, along with Thomas C. Hopkins, Instructor in Geology. At about this time, the teaching of mineralogy appears to have been moved to the Mining program. Starting with the 1895-6 Catalog, F. E. Tuttle was listed as Assistant Professor of Chemistry rather than Chemistry and Mineralogy. The 1894-5 Catalog states that the degree of Engineer of Mines was offered with specialty in Geology and Petrography. The practice of listing student thesis topics was again introduced. Geological study was not restricted to the Mining programs, however, in as much as the thesis list includes 'A Geological Survey of Centre County, PA.' by Hugh M. Beaver and Robert W. Wieland in 1895, both of whom were majors in General Science. Indeed, in 1896, Geology was one of the departments in the newly established School of Natural Sciences.

In that same year the Mining Engineering Department became the School of Mines, with Ihlseng as the first Dean. A cutback in State support, however, resulted in the school reverting to a department in the School of Engineering in 1899. Ihlseng resigned. In 1901, Marshman E. Wadsworth, an economic geologist and mineralogist, was appointed Professor of Mining and Geology to head the Department; and in 1903 Edward N. Zern was added to the Faculty as Instructor in Mineralogy. In the same year, George H. Deike, after whom the Deike Building (the present home of Geosciences) is named, received his B.S. degree in Mines and Mining.

In 1906, the Mining program was again separated from Engineering, and a School of Mines and Metallurgy was created. Although Marshman Wadsworth is listed as the first Dean, he was replaced almost immediately by Walter R. Crane, a mining engineer. Lloyd B. Smith was appointed in 1906 as Assistant in Mineralogy and Geology. He was promoted to Instructor in 1907 and Assistant Professor in 1908. The number of geological courses had by this time expanded with the emphasis (7 out of 9) on economic geology and mineralogy, rather than on paleontology. In 1909, the name was pared to 'School of Mines', the typical title of mining schools throughout the United States at that time. During the next 17 years, the school grew to be the second largest in the U.S. The name was renamed Mines and Metallurgy in 1924. Elwood S. Moore, an economic geologist who had been appointed as Professor of Geology and Mineralogy in 1909, became Acting Dean of the School in 1918 and served as Dean from 1919 to 1922, at which time he returned to the University of Toronto. He was assisted by a variety of junior appointees (assistants and instructors) who remained at Penn State for, at most, a few years each.

Dean Crane established Mining Geology as a separate major in the School of Mines in 1909 with Elwood S. Moore in charge. The first B.S. graduate was Stuart St. Clair in 1912. The first M.S. was Lloyd B. Smith

in 1913 working under Professor Moore. It appears to have been easier to earn a master's degree than now, as his thesis was only eleven pages plus a few illustrations long. In 1914-15 Stanley H. Cathcart who obtained his B.S. in Metallurgical Engineering in 1912 and in 1916 was the second M.S. in Geology, is listed as a Teaching Fellow in Geology. He later had a distinguished career with the U. S. Geological Survey, various oil companies, and was State Geologist of Pennsylvania from 1947 to 1953. By 1915-16, the number of geological sciences courses taught had grown to 21.

Arthur P. Honess, mineralogist and crystallographer, joined the faculty in 1917, followed a year later by Chesleigh A. Bonine, an economic geologist. Under the guidance of Dean Moore, a reorganization of the School of Mines led to the creation of separate full Departments of Geology and Mineralogy in 1921, with E. S. Moore as Chairman of Geology and A. P. Honess heading Mineralogy. In 1922 Moore was succeeded by C. A. Bonine. Geology and Mineralogy continued to be listed as separate departments under Bonine and Honess, respectively, until 1927, when they were combined into a single Department of Geology and Mineralogy under Bonine. The name was reduced to simply Geology in. 1929. In 1927, there was a departmental faculty of six persons: Bonine, Honess, Clair W. Robinson, and three instructors, one of whom was Frank M. Swartz who was later to become Department Head of Geology.

Until 1928, the School of Mines and Metallurgy was typical of the mining schools in many universities throughout the United States. It prepared students primarily for employment in mining and related industries. These were important in Pennsylvania where coal and steel were the basis of a large part of the State's economy. Representatives of state industrial societies elected six of Penn State's 32 trustees. These men, together with George H. Deike, an alumni trustee, saw the School as an important resource for preparing future leaders in their companies, They wanted a strong Penn State program, and one sensitive to their needs. For this purpose, they found an unusual man. Edward S. Steidle, a 1911 Penn State

graduate who was Head of the Department of Mining at Carnegie Institute of Technology, was through their efforts appointed Dean of the School of Mines and Metallurgy.

Edward Steidle ¥as a man of vision. He was a pioneer who introduced new disciplines into the curriculum. He saw the role of the College as being concerned with all aspects of the discovery, exploitation, and processing of natural mineral materials to provide the raw material and finished products required by an increasingly technological society. Steidle realized that the proper evolution of these industries required thorough knowledge of the physical sciences as they related to raw and processed materials. He changed the school's name to 'School of Mineral Industries' to describe its broader scope than conventional mining and metallurgy and he set about assembling a faculty of distinguished scholars in each of the School's disciplines. He also recognized and promoted research and graduate ·study, in addition to undergraduate education, as an important part of the School's function. He believed the organization of the school should emphasize three main fields: mineral engineering, mineral technology, and the earth sciences.

The Geology program participated fully in this innovative expansion. The present program in Ceramic Science had already grown out of mineralogy courses on clays and cement materials given from 1911 to 1923, at which time Ceramic Engineering became a. separate department with its own curriculum. Oil and Gas Production, which was an option in the Geology Curriculum in 1930, was made a separate major in 1931. In 1933, Petroleum and Natural Gas Engineering became a separate department. The geology part was renamed Geology, Mineralogy and Geography to include the interests of newly appointed Raymond E. Murphy. Initially, Chesleigh Bonine oversaw both the Geology and Petroleum and Natural Gas Engineering Departments.

Geophysics began in the Department of Mining. It was first taught in 1931 by William R. Chedsey, Head of the Department. Geophysics was a very new field at that time, and its utility in finding ore deposits was just beginning to be exploited. To emphasize how important, it was expected to become, courses were listed in the catalogs from 1934 to 1939 under 'Mining and Geophysics'. Starting in 1940, geophysics courses were listed separately.

To build up expertise in this discipline, Helmut Landsberg was brought from Frankfurt, Germany in 1934 as the first Instructor in Geophysics. However, the scope of 'geophysics' was apparently not clearly understood by Steidle when he hired Landsberg, whose interests did not run toward geophysical surveying. One of the first things Landsberg did at Penn State was start a new meteorological observatory. Some weather observations had been made continuously at the University since William Frear, Professor of Agricultural Chemistry, started them in 1888, but these early observations do not appear to have been linked to the teaching and research programs in any way. Landsberg also built the first seismic observatory in a vault beneath the central wing of what is now called the Steidle Building. He also did important research in mine ventilation. One of his papers concerns the relation of methane concentrations in mines to local weather. He showed that when air pressure falls, methane escapes more rapidly from the rocks into mine openings, increasing the risk of explosions. When air pressure rises, less methane escapes. Here was a clear case of a useful contribution of basic science to mining technology, in accordance with Steidle's general philosophy. Hans D. Neuberger, another meteorologist, was added to the Mining Faculty in 1937. In 1939, Victor Conrad, an Austrian solid earth geophysicist, after whom the Conrad Discontinuity is named, was also appointed, but he stayed only one year before moving to Harvard.

In 1941, The Department of Geology, Mineralogy, and Geography was renamed Earth Sciences, and Meteorology was moved there from Mining.

A major change in the nature of the geosciences program occurred with the appointment of Elburt F. Osborn as Head of the Department of Earth Sciences in 1946. At this time the department was reorganized into several divisions: Geology (with F. M. Swartz as Head), Mineralogy (P. D. Krynine), Geography (E. W. Miller); Geophysics (S.J.G. Pirson), and Meteorology (H. D. Neuberger).

Before this time, research had been directed primarily toward Pennsylvania problems, especially those related to the mineral industries of the State. Even more than Steidle, Osborn was convinced of the importance of basic scientific research as the foundation of technological industries. He fostered graduate study and research as a major part of the Earth Sciences program. Before World War II, graduate study had been a relatively minor aspect of the University's interests. Although graduate study was offered as early as 1862, the Graduate School was not established until 1922, and the first doctorates were not awarded in Mineral Industries until 1934, when Gordon R. Pole and Sandford S. Cole, two ceramics majors received Ph. D degrees.

As the research program expanded, emphasis on graduate study, particularly for the Ph.D., became increasingly emphasized in the geosciences. Master's degrees were originally awarded without designation of field, so early graduates with advanced degrees in geosciences may have been overlooked. The first clearly recognizable geoscience M.S. thesis appears to be 'Peculiar Jointage Caused by a Peridotite Dike in Fayette County, Pennsylvania' by Lloyd B. Smith, a Mining Engineering graduate who worked under E. S. Moore and graduated in 1913. Fourteen additional M.S. degrees were granted between 1918 and 1946. With the appointment of E. F. Osborn in 1946, the number of graduate degrees granted accelerated rapidly. The first M.S. in Geophysics was awarded to Lloyal 0. Bacon in 1948 working under Pirson, and in Geochemistry, to Israel Washaw in 1953 working under MacKenzie L. Keith. The first M.S. specifically in

Mineralogy went to Della M. Roy in 1949, working under Osborn, although Charles K. Graeber, one of Honess' students who also served as an Instructor in Geology and Mineralogy from 1922-1928, received his M.S. in 'Geology' in 1925.

The first Department of Earth Sciences Ph.D.'s were awarded in August 1951 to Calder T. Bressler in Mineralogy working under P. D. Krynine and John C. Cook in Geophysics working under B. F. Howell, Jr. In 1953, Donald E. Outlaw, working under John P. Miller, received the first Ph.D. in Geology; and in 1955, Arnulf Muan, later to become Head of the Geosciences Department and still later Associate Dean for Research of the EMS. College, received the first Ph.D. in Geochemistry working under Osborn. However, Muan was not Osborn's first Ph.D. advisee, Rustum Roy earned a doctorate degree under Osborn's direction in 1948 with a major in Ceramics.

In 1953, the name of The Pennsylvania State College was changed to The Pennsylvania State University; and Edward Steidle retired and was replaced as Dean of the College by E. F. Osborn. In the following year all of the Schools, except for the Graduate School, were renamed Colleges. The divisions of the former Department of Earth Sciences and the other Mineral Industries departments all were designated departments, with the same persons in charge, while· the former Department of Earth Sciences became the new Division of Earth Sciences! The original subdivisions had been made for several reasons, the most important of which was to provide an environment which encouraged the growth of new ideas. It also separated faculty members who had trouble working together as a team. This was an effective step in all the Divisions.

The organizational structure remained the same until 1963, when the Division of Earth Sciences was reorganized into four departments. In addition to Geography and Meteorology, these were Geology and Geophysics with L. A. Wright as head, and Geochemistry and Mineralogy with J.C. Griffiths as head.

The forerunner of the present administrative structure was initiated in 1971 when the Division of Earth Sciences was abolished and the two geoscience related departments in the Division were merged into the single Department of Geosciences with Dr. Arnulf Muan as head. The new department had three sections; Geology, with R. F. Schmalz as chairman; Geochemistry, with A. L. Boettcher as chairman; and Geophysics with S. S. Alexander as chairman.

In 1975 Dr. Bell retired as Associate Dean for Research and was succeeded in that position by Dr. Muan. This made the appointment of a new department head necessary, the choice being Dr. C. Wayne Burnham. A significant change made almost immediately by Dr. Burnham was the appointment of two coordinators, one for the undergraduate program (Dr. Robert E. Schmalz) and the other for the graduate programs (Dr. E. K. 'Buzz' Graham). Dr. Schmalz rather quickly saw the realities of his position, escaped it in 1977 and left Dr. C. P. Thornton holding it for the next eleven years. The position of graduate programs coordinator has been held by four of the faculty since it was established: Dr. Alexander (1975-1978), Dr. Graham (1978-1981), Dr. Peter Deines (1981-1983) and Dr. David Eggler (since 1983).

The move of Dr. Schmalz from graduate program chairman for geology to undergraduate program coordinator resulted in Dr. D. P. 'Duff' Gold becoming the new program chairman in 1975, a position that he held until 1985 when he was replaced by Dr. Albert Guber, who has continued in that capacity to the present. In 1974 Dr. Boettcher left Penn State for sunnier climates, and his place as graduate program chairman for geochemistry and mineralogy was taken by Dr. H. L. 'Hu' Barnes. In 1978 Dr. Derrill Kerrick

took over that job and lasted until 1983 when he was replaced by Dr. Peter Deines, the present incumbent. In geophysics Dr. Alexander remained as graduate program chair- man in geophysics until 1985, when he became department head upon Dr. Burnham's retirement. At that time Dr. Graham became the geophysics program chairman.

At about the time when Dr. Alexander took over as department head, several far-reaching changes were taking place that had their roots back in the 1950's. At that time, following the end of World War II, the geosciences departments at Penn State (like those elsewhere) markedly increased their faculties. Thirty years later this post-war faculty contingent was approaching retirement, with the result that over a rather short span of time ·a substantial number of openings occurred, involving the now more unified department in an intensive search for new faculty. More than half a dozen faculty members have been added in the past five years, and most of these have chosen to be affiliated primarily with the department rather than with one or another of the graduate programs. This in turn has precipitated renewed discussion of the structure of the department, a discussion which is still vigorously going on now.

GEOLOGY DEPARTMENT RECOLLECTIONS

In the Forties, a time when major developments in analytical procedures were taking place, the Department obtained some of the best equipment available for mineral investigations. Before he left the position of instructor in Mineralogy in 1942 to work for the X-ray division of North American Phillips Corp., Bill Parrish had secured from that company one of their first 'Norelco' X-ray spectrometers. A Geiger counter, moved by hand from point to point along a 90-degree arc, was used to take readings of the diffracted X-rays from the specimen. To get a complete pattern took over an hour since it involved taking and recording a count of some twenty seconds duration at each one degree of arc and then plotting the data. But in the days when only a few Geology departments had X-ray machines, most of them -- as in the Physics departments --

homemade film types, this unit that gave quantitative information was a major advance, particularly since students could usually be hired to do the routine work. Fortunately, the office shared by Griffiths and Bates was big enough to hold the X-ray machine and its attendee. Improvements in X-ray tube construction soon strengthened the intensity of the radiation to the point that counting time could be shortened and a motor drive could be used to move the Geiger counter slowly along the arc, with a recorder charting the output. (This eliminated the student labor need, but other work was, of course, found for those individuals having outstanding qualifications.)

The Department was also among the first, if not the first, Geology department in the country to have operational responsibility for and full use of an electron microscope. When Dr. Herbert Insley came to the faculty in 1945, the National Bureau of Standards, where he had been working, was in the process of getting a new one. He arranged for the one they had, one of the first commercial RCA models -- the only kind then available -- to come to the Mineral Industries College. As for most of the early models, there was lots of down-time for repairs and realignment, and the RCA service man was a frequent and welcome visitor; but during the instrument's up-time many research breakthroughs were made in the small room in the basement of the Steidle Building because of the order of magnitude increase in magnification attainable over that of the light microscope.

The maintenance costs of expensive instruments like electron microscopes, and the need for specialists to operate them and assist faculty and students in their use, added to the fact that the demands for an X-ray machine 'in every office' was getting to Dean Steidle's nerves (and budget), led to the idea of central instrument laboratories for the use of everyone in the College: The Mineral Constitution Labs. Consequently, most of the third floor of the new Mineral Sciences Building was planned and set aside for X-ray, Electron Microscopy and Diffraction, Spectroscopy, and Analytical Chemistry with accompanying dark rooms and office space for the experts in charge of each section. As is often the case, there were

some gaps in the planning that led to incidents, understandable in hindsight but, at the time, not regarded as funny by the 'Powers That Were'. For example, after the planning was done and could not be changed (but before the building was completed) the RCA people pointed out that a third-floor location would greatly reduce the achievable resolution of a new electron microscope being purchased because of vibrations generated elsewhere in the building, from the street, etc. That problem was licked by having a special slab of concrete poured into the floor, on which the microscope would sit, thereby effectively damping the vibrations. Another problem of some consequence arose when, after the building was finished and equipment was being moved in, it was. found that the huge, grand piano shaped spectroscope, would not go up the stairwell or fit in the elevator. Solution: take out the appropriate window, knock out enough bricks in the wall on both sides, bring in a crane from another construction site on campus, hoist the instrument up the outside of the building and through the hole in the wall, pay the extra costs, and, except for an occasional joshing, allow the red faces of those responsible for the 'oversight' to gradually return to their normal color.

The 'Labs' not only provided facilities and services that faculty and students would otherwise not have had but have also served as a mechanism for hiring outstanding people, some of the early ones being Joe Comer in Electron Microscopy, George Brindley in X-ray Crystallography, and Oliver Ingamells and Sam Goldich in Analytical Chemistry.

The World War II years were characterized by accelerated programs, oversized classes, and limited, if any, travel. The Geology faculty, at the beginning of the War, consisted of Bonine, Swartz, Robinson, lioness, Krynine, Myers, and Parrish. Bates replaced Parrish in the Spring of 1942 and Honess passed away toward the end of that year. Classes that would normally have started in the Fall semester of 1942 began in mid-May immediately after the close of that year's Spring semester, and from then on summer sessions were

eliminated and one semester followed immediately after another. Enrollment in the College as a whole dropped off drastically with the enlistment of the male students in the armed forces, but, because of the needs of industry, class sizes in the M. I. School did not change appreciably. Indeed, the pressure was on, and every effort was made to get the students out. of school and into critical jobs as rapidly as possible. Faculty teaching loads ranged from 18 to over 30 contact hours per week, depending on the number of lab sections required, and help from student teaching assistantships was not generally available. In the summer of 1942, for instance, four laboratory sections were needed to take care of an enrollment of 98 in Elementary Mineralogy --- in those days a required course for all M. I. School students, even those planning a major in Meteorology. The drop in college enrollment was short lived, for with the return of veterans under the G.I. Bill, the facilities of large colleges became stretched to the limits. P. D. Krynine, an excellent though not always a well-loved teacher and scientist, 'solved' the large enrollment problem in his classes by applying the principal 'you can't make a silk purse out of a saw's ear' (one of his many favorite sayings). He seated the students in order of their grade point averages, with the brightest in the front row so that he could give maximum attention to those truly deserving it. It was a rare -- albeit a somewhat embarrassing - achievement to be moved forward on the seating chart during the semester; not too unusual to be moved back.

In the war-time atmosphere (even State College had it) anything that interrupted or lightened the continuous grind was welcome. For the male students taking afternoon mineralogy and petrology labs -- then located on the east side of the Steidle Building an interesting and, in the eyes of the students an extremely worthwhile, diversion was provided on certain days by coeds, the self-labeled 'Cadettes', who practiced marching (the word is used loosely) in the field now occupied by Willard Hall. The disruption in the teaching process was generally harmless although on one occasion, in the lab where I was teaching Chemical Mineralogy (usual y referred to as 'Blowpipe'), the rush to the windows upon the appearance of

the marchers resulted in the spilling of a bottle of hydrochloric acid down the leg of the instructor's new bride, Jinny Bates, who was auditing the class. Heroic measures, namely the rapid spreading of baking soda on the affected limb, forestalled any permanent injury and provided a much more immediate and interesting diversion than that taking place outside.

During this period, research was encouraged but opportunity was limited by both lack of time and money. The only likely sources of small amounts of the latter were the Mineral Industries Experiment· Station, then under the direction of A. W. Gauger (a fine, though often brusque gentlemen who was proud of having once been a 'coal-cracker'), and the Central fund for Research, administered out of Old Main. Since the Experiment Station got its funds from the State to support work on the problems of Pennsylvania's major industries (e.g., coal, slate, oil, etc.), the emphasis as naturally on applied research. However, the M. I. School administration was very supportive of basic research as evidenced by continuing purchases of the· most up-to-date instrumentation, as well as by the international reputations of Swartz in Ostracods, Krynine in Sediments, and lioness in etch figures.

Interdisciplinary research was ·considerably stronger at The Pennsylvania State College than in many otherwise comparable universiti.es, not only within the Mineral Industries School, but across campus. The very structure of the school, and inclusion within it of all closely related earth and mineral science and engineering departments, resulted in close communication and joint projects involving faculty in the various disciplines. Instruments and facilities such as differential thermal analysis equipment and furnaces in Ceramics, grinding machines and floatation cells in Mining Engineering, instruments for measuring porosity and permeability in PNG, were readily available to the Geology faculty, as was the expertise necessary to help them in their use. Thus, in the forties in the area of mineralogy and crystallography, for example, people like Waldemar Weyland Sam Zerfoss in Ceramics, H. M. Davis and Harold Read in Metallurgy, and

Herb Kellogg in Mining could always be relied on for help and advice on problems bordering on their fields. On the other side of the coin', faculty responsible for the use of the more complicated instruments were encouraged by the interactions to devise improvements and techniques pertinent to the needs of the other disciplines, and, as a spin-off, often found to be helpful in their own research. Indeed, the interdisciplinary nature of problems posed to the specialists in the Mineral Constitution Labs generated many contributions to journals and societies concerned with improvements in analytical instruments and their use. As at present, of course, interdisciplinary liaisons extended beyond the M. I. School. Honess and Zerfoss, for instance, interrelated closely with Mary Willard in Chemistry and Charles Jeffries in Agronomy, Bates and Griffiths with W. P. Davey in Physics and Jim Bartoo in Math, and arrangements could always be easily made with people like Henry Yeagley in Physics, Merrill Eenske in the Petroleum Refining Lab, and Wit Hutchison in Chemistry, among others, to use their facilities.

Tom Bates, Professor Emeritus of Mineralogy

THE DEIKE BUILDING -- HOME OF THE GEOLOGICAL SCIENCES

Penn State's geological sciences graduate and research program was becoming severely cramped for space by the late 1950's. The space needs were in all fields but were especially acute for the high-temperature phase equilibrium experimental work. In addition, new facilities were needed for the library and for the growing earth sciences undergraduate program. The National Science Foundation had been generously supportive of the experimental research program, and it was the NSF that made possible the construction of excellent facilities to meet the needs. The NSF did this by providing federal grants which would become available if matched by local funds. The matching took place, resulting in two buildings, well designed and equipped for the geological sciences program.

The first building was constructed in the courtyard of the Mineral Sciences Building. A two-story structure, connected to Mineral Sciences, it provided 5,000 square feet of laboratory space for high temperature, phase equilibrium research, especially at high pressures with H2o and/or CO2 as components. This building, occupied in February 1962, was a great asset, taking care of the most immediate needs of the geochemistry experimental program. Wayne Burnham was very helpful in volunteering to work with the University physical plant in the design and construction of this facility. Research groups moving into the courtyard building were principally those of Burnham and of Osborn. Meanwhile, Tuttle's high temperature pressure group had been (1958) provided space in the new Research Unit B, a building constructed on the eastern edge of the campus, and Spackman's Coal Research Section was occupying space in a frame building on central campus.

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*Spackman has written a detailed description of the building, published in Min. Ind., v. 32, No. 7, pp. 1-7, March 1963.

Construction of the Courtyard Building and Research Unit B were critically important to the expanding geochemistry experimental program, but it was apparent that an additional, new, large building was needed to house the total earth sciences program. A grant of $600,000 from NSF brought forth matching funds of $2,675,000 from the General State Authority to construct the new building. This was the largest NSF grant, to that date, for construction of a university facility -- an indication of the high regard in which this federal science agency held the Penn State earth sciences research and graduate program.

During the period of design and construction of the building, 1963-64, William Spackman played a key role, representing the faculty in working closely with Walter Wiegand, the University's Director of Physical Plant, Planning and Construction, and with the architects to get the facility that the faculty felt was needed.

Spackman was tireless. in his checking on even the smallest details. The result was a highly functional, completely air-conditioned building of 117,000 sq. ft., consisting of six stories, atop of which was a meteorology facility, with radar and other modern equipment; and below which were a seismic observatory with seismic pier and recording rooms, and a mass spectroscopy laboratory. To maximize College wide utilization of facilities, especially the new library, the Mineral Constitution Laboratories, and the shops, the new building was connected to all three stories of the Mineral Sciences building. The upper four floors of the new building were constructed around a central core – a vertical shaft six feet wide and 96 feet long. It carries all heating, cooling, ventilating and service lines, making all facilities readily available at each of these floor levels. Vertical transportation in the building is provided by three high speed elevators. Polished slabs of granite, each two feet wide and five feet four inches high, were inset in the walls of the ground floor corridor. These spectacular exhibits, appropriately lighted to show off the features for which each was especially selected, display the range of composition and texture common to the granitic basement rocks of the continent. An oil painting by George Zoretich, commissioned by the Pennsylvania Refractories Industry, hangs on the wall of the lobby.

At a dedication ceremony in 1965, the new Earth Sciences building was renamed Deike (pronounced dike) building, in honor of George H. Deike, an illustrious 1903 graduate of the College in mining engineering. In 1925 he was elected to Penn State's Board of Trustees and served on the Board continuously until his death in 1963. His role in the development of the College of Earth and Mineral Sciences was critically important. The former School of Mines, established in 1896, and later named the School of Mines and Metallurgy, struggled under five deans from 1896 until 1928, with poor facilities and weak budgets. Mr. Deike, with the effective support of President Hetzel, was instrumental in changing this pattern. Edward Steidle, a 1911 Penn State graduate in mining engineering and at that time professor of mining engineering at Carnegie Tech, was brought to Penn State as Dean in 1928. The name was changed to School of

Mineral Industries, and in 1929 a fine, new building was constructed for the school, and named the Mineral Industries Building. It is now the Steidle Building. With strong support for his program from the University Trustees, the mineral industries and the legislature, Dean Steidle built a remarkable educational institution. He served as a leader with great energy and foresight for 25 years.

In 1976, meteorology and geography moved from Deike to the nearby, new Environmental Sciences Building, allowing Deike to become almost exclusively the home of the geological sciences.

E. F. Osborn

September 1987

APPENDIX II - Theses 1904-2023

THESIS TITLE	GRADUATE STUDENT	DEPARTMENT	DEGREE NAME	DEGREE	YEAR	ADVISOR
Geology of Center County	Liljegren, E. P.	Geology	Geology	B.S.	1904	Zern, E. N.
The siliceous oolites of the Bellefonte quadrangle, Pennsylvania	Cadman, Wilson Kennedy	Geology/Mining geology	Geology	B.S.	1913	Moore, Elwood S
Reconnaissance in the Highlands of eastern Orange County, New York	Ayres, Vincent Leonard	Geology/Mining geology	Geology	B.S.	1916	Moore, Elwood S
The role of chlorine in the genesis of certain lead deposits	Nevin, C. M.	Geology/Mining geology	Geology	B.S.	1916	Moore, Elwood S
Notes on the geology of the San Juan region	Teas, L. P.	Geology/Mining geology	Geology	B.S.	1916	Moore, Elwood S
Origin of concretions in certain shales of the Bellefonte quadrangle	Cathcart, Stanley Holman	Geology, Mineralogy, Geography	Geology	M.S.	1916	Unknown
The geology of the Mt. Pleasant Basin	Ellis, G. Leaman	Geology/Mining geology	Geology	B.S.	1917	Moore, Elwood S
The geology of the Belcher Islands, Hudson Bay	McCulloch, J. Paul	Geology/Mining geology	Geology	B.S.	1917	Moore, Elwood S
The Irvine, Kentucky, oil and gas field	Caudill, Samuel Jefferson	Geology, Mineralogy, Geography	Geology	M.S.	1918	Unknown
The geographic influences in the growth of Cleveland, Ohio	Nutting, John Morley	Geology, Mineralogy, Geography	Geology	M.S.	1918	Unknown
The white clays of the Nittany Valley	Bayles, Gerard L.	Geology/Mining geology	Geology	B.S.	1920	Moore, Elwood S
Possibilities of the occurrence of oil and gas in the Nittany Valley	Paxson, Roland Brubaker	Geology/Mining geology	Geology	B.S.	1920	Moore, Elwood S
The oil and gas areas in Pennsylvania	Rife, Edwin J	Geology/Mining geology	Geology	B.S.	1920	Moore, Elwood S
The geologic structure of the lower Nittany Valley	Ayres, Vincent Leonard	Geology, Mineralogy, Geography	Geology	M.S.	1920	Unknown
The identification of geologic formations by microscopic study of samples	Graeber, Charles K.	Geology/Mining geology	Geology	B.S.	1921	Bonine, C. A.
Geology of Deering, N.H. and vicinity	Holden, Edward F	Geology/Mining geology	Geology	B.S.	1921	Moore, Elwood S
Geology and ore deposits of the Park City district Utah with special reference to the ores of the Daly Judge Mine	Newhouse, W. H.	Geology/Mining geology	Geology	B.S.	1921	Bonine, C. A.
The Ganister deposits of Pennsylvania with special reference to their chemical and physical properties	Taylor, Thomas Garrett	Geology/Mining geology	Geology	B.S.	1921	Bonine, C. A.
Report of the oil possibilities of Lancaster and Chester Counties, Pennsylvania	Anderson, Ray B	Geology/Mining geology	Geology	B.S.	1922	Moore, Elwood S
Conditions of deposition in the southern anthracite basin during Pottsville time	Bace, A. C.	Geology/Mining geology	Geology	B.S.	1922	Bonine, C. A.
A sub-surface study of well cuttings	Barcklow, J. C.	Geology/Mining geology	Geology	B.S.	1922	Bonine, C. A.
The geology of Mifflin County, Pennsylvania	Ellinger, George Austin	Mining geology	Geology	B.S.	1922	Unknown
Accumulation of oil and gas in the Big Horn basin, Wyoming	Keller, Paul Lewis	Mining geology	Geology	B.S.	1922	Unknown
A study of oil and gas in Montana with reference to their origin	Klinger, Edgar DeWitt	Mining geology	Geology	B.S.	1922	Unknown
The silica refractories of Pennsylvania	Taylor, Thomas Garrett	Geology, Mineralogy, Geography	Geology	M.S.	1922	Unknown
A peg model map of Bryan Heights Salt Dome	Dewees, Everett J.	Mining geology	Geology	B.S.	1923	Unknown

Sub-surface correlation of geological formation by the determination of the percentage of organic content	Tritt, John Scouller	Mining geology	Geology	B.S.	1923	Unknown
The Kettle Creek gas field	Zorichak, Joseph John	Mining geology	Geology	B.S.	1923	Unknown
The Helderberg limestone of Pennsylvania	Fisher, Lloyd Wellington	Geology, Mineralogy, Geography	Geology	M.S.	1923	Unknown
The petrography of the Ordovician limestones of Central Pennsylvania	DeChicchis, Romualdo	Geology	Geology	B.S.	1924	Unknown
Studies of the upper Devonian and Pottsville formations of western Venango County, Pennsylvania	Johnston, Gerald Hewitt	Mining geology	Geology	B.S.	1924	Unknown
The utilization of blast furnace slag in the manufacture of paving block	Linn, Jacob Humbird	Mining geology	Geology	B.S.	1924	Unknown
Geology of the Conemaugh formation around Saxonburg, Pa	Wilhelm, Arthur Karl	Mining geology	Geology	B.S.	1924	Unknown
Billy Creek Anticline, Johnson County, Wyoming	Yeager, Lloyd Irvin	Mining geology	Geology	B.S.	1924	Unknown
Oil and gas fields of northeastern Wyoming	Hilburn, Fred Everitt	Mining geology	Geology	B.S.	1925	Unknown
The occurrence and origin of zinc ores at Mascot, Tennessee	Kaley, Harry Wesley	Mining geology	Geology	B.S.	1925	Unknown
A study of the Bentonite occurences in central Pennsylvania	Smith, R. H.	Mining geology	Geology	B.S.	1925	Unknown
The geology and petrography of the mica peridotite dike at Dixonville, Pennsylvania	Graeber, Charles Karsner	Geology, Mineralogy, Geography	Geology	M.S.	1925	Unknown
Petrography of Black River limestone at Bellefonte, Pennsylvania	Bartleson, Edith	Mining geology	Geology	B.S.	1926	Unknown
The geology of the Bruner Pool, Tulsa, Oklahoma	Bartram, Paul L.	Geology/Mineralogy	Geology	B.S.	1926	Unknown
The occurrence of oil and gas in the northern part of the Pittsburgh Quadrangle	Beardsley, William R.	Mining geology	Geology	B.S.	1926	Unknown
Correlation of the bentonite beds in the Ordovician of Central Pennsylvania	Hess, Robert Martin	Mining geology	Geology	B.S.	1926	Unknown
The use of etch figures in the determination of crystal symmetry	Hughes, Harry Herbert	Mining geology	Geology	B.S.	1926	Unknown
Oil and gas possibilities in Muncy Valley, Lycoming County, Pennsylvania	Fritts, C. C.	Mining geology	Geology	B.S.	1927	Unknown
A geologic report on Greenwood Township, Clearfield County, Pennsylvania	Mitchell, Johnson Boyce	Mining geology	Geology	B.S.	1927	Unknown
The peneplains of North America	Nichols, Arthur A.	Mining geology	Geology	B.S.	1927	Unknown
The occurrence of concretionary celestite in a dolomitic limestone, at Ganister, Pennsylvania	Williams, Emil F.	Mining geology	Geology	B.S.	1927	Unknown
Fauna of the Chemung of the Bald Eagle Valley	Helffrich, Oliver Boone	Geology	Geology	B.S.	1928	Unknown
Investigation of the magnetite ore deposits near Reading, Pennsylvania	Moyer, Forrest Theodore	Mining geology	Geology	B.S.	1928	Unknown
Peneplains in Central Pennsylvania	Patton, Franklin S.	Geology	Geology	B.S.	1928	Unknown
A micro study of the insoluble residues of the Bellefonte, Axeman, and Nittany formations at Bellefonte, Center County, Pennsylvania	Savenius, Oiva Ilmar	Geology	Geology	B.S.	1928	Unknown
The geology of Nippenose Valley	Anderson, John Alexander	Geology	Geology	B.S.	1929	Unknown
Stratigraphy of the lower Silurian formations at Mann Narrows, Lewistown, Pa	Barnsley, Edward R. (Edwa	Geology	Geology	B.S.	1929	Unknown
Stratigraphy of lower Silurian shales at Mill Hall, Pennsylvania	Mahoney, Roger Sylvis	Geology	Geology	B.S.	1929	Unknown

A study of the Lower Devonian formations at Mt. Rock, near Lewistown, Pennsylvania	Bergener, Glen	Geology	Geology	B.S.	1930	Unknown
Notes on crystal etchings	Faust, George T.	Geology	Geology	B.S.	1930	Unknown
A peg model map of western Pennsylvania	Loy, Max S.	Geology	Geology	B.S.	1930	Unknown
Permeability and porosity relationships in the Bradford and Venango second sands	Woods, Rex W.	Geology	Geology	B.S.	1930	Unknown
Detailed study of the stratigraphy of the upper part of the Clinton and McKenzie Formations near Petersburg, Pennsylvania	Campbell, Clifton J.	Geology	Geology	B.S.	1931	Unknown
Temperature-porosity relationships in oil sands	Heyl, George R.	Geology	Geology	B.S.	1932	Unknown
An insoluble residue study of the Lower Lowville and Upper Carlim formations at Bellefonte and Salona, Pennsylvania	McNary, G. G.	Geology	Geology	B.S.	1932	Unknown
A petrographic study of the Paleozoic rocks in the vicinity of State College, Pa	Espenshade, Gilbert How	Geology	Geology	B.S.	1933	Unknown
Correlation studies of the central and south central Pennsylvania bentonite occurences	Rosenkrans, Robert Russell	Geology, Mineralogy, Geography	Geology	M.S.	1933	Unknown
The etching of crystals by optically active solvents	Jones, J. Robert	Geology, Mineralogy, Geography	Geology	M.S.	1934	Unknown
The preparation of media for use in the determination of high refractive indices	Parrish, William	Geology	Geology	B.S.	1935	Unknown
Froth flotation as applied to the separation of mineral matter from coal	Bray, Joseph Moyer	Geology	Geology	B.S.	1937	Unknown
Sky-blue determinations	Jobbins, Howell Stevens	Geology	Geology	B.S.	1937	Unknown
A study of several species of ostracodes as found in the Keyser limestone exposed near Selinsgrove, Pennsylvania	Morris, David F.	Geology	Geology	B.S.	1937	Unknown
Investigations of crystal symmetry with optically inactive and active solvents	Grow, Joseph Albert	Geology	Geology	B.S.	1938	Unknown
Radioactivity in oil sandstones	Ingham, Albert I.	Geology	Geology	B.S.	1938	Unknown
Subsurface study of the Pennsylvania State College campus	Updegraff, Charles Henry	Geology	Geology	B.S.	1938	Unknown
Stratigraphy, petrology, and correlation of the H.R. Hardy no. 1 well, Clay County, Illinois	Friedman, Leon	Petroleum and natural gas engineering	Petroleum and natural gas engineering	B.S.	1939	Unknown
Experiments in radioactive stratigraphy	Klepper, M. Ruhl	Geology	Geology	B.S.	1939	Unknown
Petrography and genesis of the Bellefonte sandstone	Tuttle, O. F. (Orville Frank)	Geology	Geology	B.S.	1939	Unknown
Some faunas from the Onondaga formation in central Pennsylvania and West Virginia	Swain, Frederick M. (Frederick Morrill)	Geology, Mineralogy, Geography	Geology	M.S.	1939	Unknown
Upper Silurian ostracode faunas from Nearpass Quarries, New Jersey	Whitmore, Frank C.	Geology, Mineralogy, Geography	Geology	M.S.	1939	Unknown
Petrography and genesis of the Gatesburg sandstone	Kellberg, John Morgan	Geology	Geology	B.S.	1940	Unknown
Resistivity surveys over Penn's Cave	Keller, Fred	Geology	Geology	B.S.	1940	Unknown

Variations within the species Kloedenella gibberosa	Kline, Loren E.	Geology	Geology	B.S.	1940	Unknown
Iso-potential line survey over Penn's Cave	Landis, Sam	Geology	Geology	B.S.	1940	Unknown
The petrology of the Gates Peridotite Dike	Staples, James McFarland	Geology	Geology	B.S.	1940	Unknown
Petrographic interpretation of the Ordovician-Silurian boundary problem in central Pennsylvania	Tuttle, O. F. (Orville Frank)	Geology, Mineralogy, Geography	Geology	M.S.	1940	Unknown
A lead-zinc deposit in the Milesburg Gap, Pennsylvania	Goettman, Franklin P.	Geology	Geology	B.S.	1941	Unknown
A study of the Spitzenberg conglomerate, Berks County, Pa	Heyl, Allen	Geology	Geology	B.S.	1941	Unknown
Petrologic study of some rocks of the Uinta Basin and Uinta Mountains, Utah	Thompson, George A.	Geology	Geology	B.S.	1941	Unknown
A petrographic study of the Kettleman Hills productive zones	Landis, San Wallace, Jr.	Geology, Mineralogy, Geography	Geology	M.S.	1941	Unknown
Stratigraphic variations in the middle Silurian of Stone Valley	Lowry, Jean	Geology	Geology	B.S.	1942	Unknown
Shifts in the center of coal production in eastern Kentucky and western Pennsylvania : an application of the centrographic method	Veigel, E. C.	Earth Science	Earth Science	B.S.	1942	Unknown
The determination of the magnetic vertical intensity and its application to deep geology in Pennsylvania	Young, John G.	Mineral industries	Mineral industries	B.S.	1942	Unknown
Petrology of the Gatesburg formation of central Pennsylvania	Pelto, Chester Robert	Geology	Geology	M.S.	1942	Unknown
A middle Ordovician and some lower Devonian conularids, with two orthoceratids, from central Pennsylvania	Richardson, Eugene Stanley, Jr.	Geology	Geology	M.S.	1942	Unknown
Effect of screens on wind velocity	Brunstein, Alan Irving	Earth Science	Earth Science	B.S.	1943	Unknown
Proposed industrial utilization of the waste slate of Pennsylvania	Chase, Charles William	Earth Science	Earth Science	B.S.	1943	Unknown
Investigation of the apparent shape of the sky	Miller, Albert	Earth Science	Earth Science	B.S.	1943	Unknown
Petrography of Franklin oil mine	Rhoades, Merald Elvin	Geology	Geology	B.S.	1943	Unknown
The fossils of the Middle and Upper Devonian	Mangus, Marvin Dale	Geology	Geology	B.S.	1945	Unknown
The petrography and petrology of Pennsylvania sediments in the vicinity of Midland, Pennsylvania	Ferm, J. C.	Earth Science	Earth Science	B.S.	1946	Unknown
Mineralogy of the insoluble residues from limestone at Oak Hall, Pennsylvania	Folk, Robert Louis	Earth Science	Earth Science	B.S.	1946	Unknown
The type locality of celestite	Mangus, Marvin Dale	Mineralogy	Mineralogy	M.S.	1946	Unknown
Application of aerial photographs to the geologic mapping of the Julian area	Moses, Selma	Geology, Mineralogy	Geology	B.S.	1947	Unknown
Geology of Warrior Ridge, Huntingdon county, Pennsylvania	Barbosa, Aluizio Licinio de Miranda	Geology	Geology	M.S.	1947	Unknown
A study of the relationship between wind direction and visual range at State College, Pennsylvania	Gutnick, Murray	Earth Science	Earth Science	B.S.	1948	Unknown
The trilobites of the Bellefontia collieana zone of the Stonehenge limestone in the State College region	Palmer, Allison R.	Earth Science	Earth Science	B.S.	1948	Unknown
Stratigraphy of the Mancos shale of Black Mesa, Arizona	Adams, Linn Frank	Geology	Geology	M.S.	1948	Unknown

A study of the potentials measured on an electrolyte-clay-electrolyte system	Bacon, Lloyal Orrin	Geophysics and Geochemistry	Geophysics and Geochemistry	M.S.	1948	Unknown
Cyclothems of the upper Allegheny and basal Conemaugh groups near Brookville, Jefferson County, Pennsylvania	Ferm, John Charles	Geology	Geology	M.S.	1948	Unknown
Two new species of Ordovician ostracoda from the lower Trenton Nealmont limestone	Reynolds, Norman Kennet	Geology	Geology	B.S.	1949	Unknown
The probable genesis of the cryptozoon reefs in the State College region	Smith, James D.	Geology, Mineralogy	Geology	B.S.	1949	Unknown
"Cyrtospirifer disjunctus" species in Pennsylvania and southwestern New York	Bye, Doris Lippincott	Geology	Geology	M.S.	1949	Unknown
The method of 'Ronov' as applied to Appalachian geology	Doan, David Bentley	Mineralogy	Mineralogy	M.S.	1949	Unknown
Mineralization surrounding ore in the southwestern Wisconsin lead-zinc district	Kennedy, Vance Clifford	Geophysics and Geochemistry	Geophysics and Geochemistry	M.S.	1949	Unknown
Evolutionary trends of some lower Devonian faunal stocks	Rees, Rhys Willis	Geology	Geology	M.S.	1949	Unknown
Phase relations and structural phenomena in the fluoride model systems LiF-BeF^2 and NaF-BeF^2	Roy, D. M.	Mineralogy	Mineralogy	M.S.	1949	Unknown
The System Diopside forsterite anorthite	Tait, Donald Burckholder	Mineralogy	Mineralogy	M.S.	1949	Unknown
The structural geology and mineralization of Sinking Valley, Pa	Zeller, Robert Allen, Jr.	Geology	Geology	M.S.	1949	Unknown
Lithofacies and biofacies of the Keyser limestone at Jersey Shore, Pennsylvania	Carswell, Louis D.	Geology	Geology	B.S.	1950	Unknown
The stratigraphy of the Greenbrier limestone in south-western Pennsylvania and western Maryland	Haney, Warren Dale	Geology	Geology	B.S.	1950	Unknown
Petrology of authigenic silica in the Beekmantown Group of central Pennsylvania	Folk, Robert L.	Mineralogy	Mineralogy	M.S.	1950	Unknown
Porosity	Rosenfeld, Melvin Arthur	Mineralogy	Mineralogy	M.S.	1950	Unknown
Fauna of the Upper Cambrian Warrior formation of central Pennsylvania	Tasch, Paul	Geology	Geology	M.S.	1950	Unknown
Petrography and petrology of rocks near the Quadrant-Phosphoria boundary in S.W. Montana	Weaver, Charles E. (Charles Edward)	Mineralogy	Mineralogy	M.S.	1950	Unknown
The "Questa" Molybdenum Mine, Taos County, New Mexico	Schilling, John H.	Geology	Geology	B.S.	1951	Unknown
Thickness and sedimentary features of the Silurian and Lower Devonian formations at Bedford, Pennsylvania	White, Richard Edward	Geology	Geology	B.S.	1951	Unknown
An analysis of sphericity and roundness of quartz grains	Curray, Joseph Ross	Mineralogy	Mineralogy	M.S.	1951	Griffiths, J.C.
The system gallia-alumina-water and its bearing on the stability and composition of diaspore	Hill, Vincent George	Mineralogy	Mineralogy	M.S.	1951	Osborn, E.F.

A study of the applicability of the shielded mono-electrode to resistivity well logging	Keller, George Vernon	Geophysics and Geochemistry	Geophysics and Geochemistry	M.S.	1951	Howell Jr., B.F.
Use of radio frequencies in the study of geologic structure	Licastro, Pasquale H.	Geophysics and Geochemistry	Geophysics and Geochemistry	M.S.	1951	Howell Jr., B.F.
Alteration and chromite mineralization in the Pennsylvania-Maryland state line serpentine belt	Luft, Stanley Jeremie	Geology	Geology	M.S.	1951	Ridge, John D.
Stratigraphy and intraformational structures from well cores of the Upper Devonian of the Bradford oil field	Russell, Edmund Louis, Jr.	Geology	Geology	M.S.	1951	Swartz, Frank M.
Fauna of the Trenton limestone near Waddle, central Pennsylvania	Schneider, Allan F. (Allan Frank)	Geology	Geology	M.S.	1951	Swartz, Frank M.
The Mississippian sediments of the Bedford quadrangle region	Terriere, Robert Theodore	Geology	Geology	M.S.	1951	Swartz, Frank M.
Gravity investigation in north central Pennsylvania	Vozoff, Keeva	Geophysics and Geochemistry	Geophysics and Geochemistry	M.S.	1951	Howell Jr., B.F.
The petrology of the Roslyn Arkose, central Washington	Bressler, Calder Tupper	Mineralogy	Mineralogy	Ph.D.	1951	Krynine, P.D.
An analysis of airborne surveying for surface radioactivity	Cook, John Call	Geophysics and Geochemistry	Geophysics and Geochemistry	Ph.D.	1951	Howell Jr., B.F.
Effect of silica on the dielectric properties of Barium Titanate	Ross, Howard	Geochemistry, Ceramics	Geochemistry	B.S.	1952	Unknown
Conductivity study of aqueous kaolin-NaCl mixtures	Berg, Joseph Wilbur	Geophysics and Geochemistry	Geophysics and Geochemistry	M.S.	1952	Howell Jr., B.F.
The correlation of the Jurassic Bluff and Junction Creek sandstones in southeastern Utah and southwestern Colorado	Cadigan, Robert Allen	Geology	Geology	M.S.	1952	Unknown
Gravity traverse in North Eastern Pennsylvania	Duecker, John Cecil	Geophysics and Geochemistry	Geophysics and Geochemistry	M.S.	1952	Howell Jr., B.F.
Petrology of the Chemung formation above the Bradford third sand from core of the Summit well	Haney, Warren Dale	Mineralogy	Mineralogy	M.S.	1952	Krynine, P.D.
Studies in portions of the system Na^2O-MgO-Al^2O^3-SiO^2	Insley, Robert Hiteshew	Mineralogy	Mineralogy	M.S.	1952	Pennington, R.P.
A study of the uranium deposit near Mauch Chunk, Pennsylvania	Klemic, Harry	Geology	Geology	M.S.	1952	Ridge, John D.
Stratigraphy and paleontology of the lower Ordovician Axemann limestone of Kishacoquillas and Nittany valleys, Central Pennsylvania	Macaulay, George Raymond, Jr.	Geology	Geology	M.S.	1952	Swartz, Frank M.
The geology of the Northcentral Rectangle of the Wind Gap, Pennsylvania Quadrangle	McGlade, William George	Geology	Geology	M.S.	1952	Swartz, Frank M.; Osberg, Philip H.

Nature and distribution of faunas in well cores from the Bradford oil field	Metz, Clyde Thomas	Geology	Geology	M.S.	1952	Swartz, Frank M.
The mineralogy of the Campbell mine, Bisbee, Arizona	Navias, Robert Alexander	Geology	Geology	M.S.	1952	Ridge, John D.
Microspores of the lower Kittanning coal in its type area	Riffelmacher, Wallace Edwin	Geology	Geology	M.S.	1952	Spackman, William
Upper Devonian sediments of the Bedford quadrangle	Turley, Mitchell Reed	Geology	Geology	M.S.	1952	Swartz, Frank M.
Stratigraphy of the Tonoloway and Keyser limestones near Bedford, Pennsylvania	Wintermute, Thomas Judson	Geology	Geology	M.S.	1952	Swartz, Frank M.
Petrography and petrology of the Lower Ordovician Beekmantown carbonate rocks in the vicinity of State College, Pennsylvania	Folk, Robert L.	Mineralogy	Mineralogy	Ph.D.	1952	Krynine, P.D.
Phase equilibria in the system $MgO-Al^2O^3-H^2O$ and in quaternary systems derived by the addition of SiO^2, CO^2, and NO^2	Roy, D. M.	Mineralogy	Mineralogy	Ph.D.	1952	Osborn, E.F.
Mineralogy and petrology of the residual kaolins of the southern Appalachian region	Sand, Leonard Bertram	Mineralogy	Mineralogy	Ph.D.	1952	Bates, T.F.
Mineralogy and petrology of some paleozoic clays from Central Pennsylvania	Weaver, Charles E. (Charles Edward)	Mineralogy	Mineralogy	Ph.D.	1952	Bates, T.F.
A summary of photogeologic techniques, with some applications to the Cypress Hills, Saskatchewan	Bailey, Ralph Fraser	Geology	Geology	M.S.	1953	Swartz, Frank M.
Upper Devonian sediments of the "Grand Canyon of Pennsylvania"	Cobb, Robert Eugene	Geology	Geology	M.S.	1953	Davidson, H.M.; Aurand, O.H.
A spectrographic and petrographic study of the ore minerals at Climax, Colorado	Haines, David Vincent	Geology	Geology	M.S.	1953	Ridge, John D.
Attenuation of seismic waves near an explosion	Kaukonen, Everett Konstantine	Geophysics and Geochemistry	Geophysics and Geochemistry	M.S.	1953	Howell Jr., B.F.
The Pocono sandstone neighboring the northern anthracite basin, Pennsylvania	Leonard, Arnold David	Geology	Geology	M.S.	1953	Swartz, Frank M.
Laboratory studies of the self-potential reservoir sands	McConnell, Elliott Bonnell, Jr.	Geophysics and Geochemistry	Geophysics and Geochemistry	M.S.	1953	Howell Jr., B.F.
Studies in the quaternary system $MgO-Cr^2O^3-Al^2O^3-SiO^2$	Warshaw, Israel	Geochemistry	Geochemistry	M.S.	1953	Keith, M.L.
Phase equilibria in the system $CaO-TiO^2-SiO^2$ and their significance	DeVries, Robert Charles	Mineralogy	Mineralogy	Ph.D.	1953	Unknown
A hydrothermal study of the system $FeO-SiO^2-H^2O$	Flaschen, Steward Samuel	Mineralogy	Mineralogy	Ph.D.	1953	Osborn, E.F.
Petrology of the Pennsylvanian sandstones and conglomerates of the Ardmore Basin	Jacobsen, Lynn	Mineralogy	Mineralogy	Ph.D.	1953	Unknown
Mineralogy of the serpentine group	Nagy, Bartholomew Stephen	Mineralogy	Mineralogy	Ph.D.	1953	Bates, T.F.

A geologic and hydrologic study of Shackham watershed, New York State	Outlaw, Donald Elmer	Geology	Geology	Ph.D.	1953	Miller, John P.
Petrographic variation in the Oriskany "Sandstone Complex"	Rosenfeld, Melvin Arthur	Mineralogy	Mineralogy	Ph.D.	1953	Griffiths, J.C.
Photomechanical wave analyzer for seismic wave analysis	Andrews, Alday Bishop	Geophysics and Geochemistry	Geophysics and Geochemistry	M.S.	1954	Unknown
Attenuation of seismic energy near an explosion	Budenstein, David	Geophysics and Geochemistry	Geophysics and Geochemistry	M.S.	1954	Unknown
Lateral Variation in the Lower Cedar Grove Coal Seam, Logan and Mingo Counties, West Virginia.	Cameron, Alexander Rankin	Geology	Geology	M.S.	1954	Spackman Jr., William
The application of a discriminant function to a problem in petroleum petrology	Emery, John Rathbone	Mineralogy	Mineralogy	M.S.	1954	Unknown
The measurement of packing in sandstones	Kahn, James Steven	Mineralogy	Mineralogy	M.S.	1954	Unknown
The serpentine-amesite join in the system Mg O - $Al^2 O^3$ - $Si O^2$ - $H^2 O$ and classification of the chlorite minerals	Nelson, Bruce Warren	Mineralogy	Mineralogy	M.S.	1954	Unknown
The effect of shot depth on the generation of seismic energy	Stengel, Eugene Henry	Geophysics and Geochemistry	Geophysics and Geochemistry	M.S.	1954	Unknown
Effect of stemming on energy-content of explosion-generated seismic pulses	Berg, Joseph Wilbur	Geophysics and Geochemistry	Geophysics and Geochemistry	Ph.D.	1954	Howell, Benjamin F.
An integrated study of petrographic, carbonization and chemical properties of some bituminous coal seams from the Appalachian region	Channabasappa, Kenkere C.	Geology	Geology	Ph.D.	1954	Unknown
Dispersion of seismic waves near an explosion	Keller, George V.	Geophysics and Geochemistry	Geophysics and Geochemistry	Ph.D.	1954	Unknown
Petrology of outcropping post-Wolfcampian Permian rocks in Kansas	Swineford, Ada	Mineralogy	Mineralogy	Ph.D.	1954	Unknown
The Mercer fire-clay in Clinton and Centre Counties, Pennsylvania	Weitz, John Hills	Mineralogy	Mineralogy	Ph.D.	1954	Unknown
A portion of the system:$CaO.SiO^2$-$SrO.SiO^2$-H^2O	Buckner, Dean Alan	Geophysics and Geochemistry	Geophysics and Geochemistry	M.S.	1955	Unknown
Comparison of X-ray diffraction and K-factor studies of clay content in artificial cores	Cervik, Joseph	Geophysics and Geochemistry	Geophysics and Geochemistry	M.S.	1955	Howell Jr., B.F.
Secondary Manganese deposits of Pennsylvania	Chase, Leonard Richard	Geology	Geology	M.S.	1955	Unknown
Secondary uranium minerals at the W. Wilson mine near Clancy, Montana	Emerson, Donald Orville	Mineralogy	Mineralogy	M.S.	1955	Unknown
A chromographic study of nickel in soils and plants at the Lancaster Gap Mine, Pennsylvania	Good, Richard Standish	Geology	Geology	M.S.	1955	Ridge, John D.

The Fauna of the Reedsville Shale at Antes Gap Pennsylvania	Gross, C.M.	Unknown	Unknown	M.S.	1955	Unknown
An investigation of geochemical prospecting by testing stream waters	Illsley, Charles Truman	Geophysics and Geochemistry	Geophysics and Geochemistry	M.S.	1955	Unknown
The genetic Pottsville-Tuscarora relationship in eastern Pennsylvania	Landy, Richard Allen	Mineralogy	Mineralogy	M.S.	1955	Unknown
Trivalent -- pentavalent substitutions in silica structures	Shafer, Elena Camilli	Mineralogy	Mineralogy	M.S.	1955	Unknown
Mineralogy of the Lone Eagle uranium-bearing deposit, Boulder batholith, Jefferson County, Montana	Shulhof, William Peter	Mineralogy	Mineralogy	M.S.	1955	Unknown
X-ray diffraction study of orientation in the Chattanooga shale	Silverman, Eugene Norton	Mineralogy	Mineralogy	M.S.	1955	Unknown
Primary uranium mineralization in some hydrothermal vein deposits in the Boulder batholith, Montana	Bieler, Barrie Hill	Mineralogy	Mineralogy	Ph.D.	1955	Wright, H.D.; Bates, T.F.
The system akermanite-gehlenite-anorthite-diopside	Gee, Kenneth Homer	Mineralogy	Mineralogy	Ph.D.	1955	Unknown
Phase equilibria at liquidus temperatures in the system MgO-FeO-Fe^2O^3-SiO^2	Muan, Arnulf Ingar	Geophysics and Geochemistry	Geophysics and Geochemistry	Ph.D.	1955	Unknown
A litho-stratigraphic, petrographic and chemical investigation of the lower middle Ordovician carbonate rocks in central Pennsylvania	Rones, Morris	Geology	Geology	Ph.D.	1955	Swartz, Frank M.
Relationship of dimensional orientation of quartz grains to directional permeability in sandstones	Hutta, Joseph John	Mineralogy	Mineralogy	M.S.	1956	Griffiths, J.C.
Gravity investigation in the Renovo area of Central Pennsylvania	Jarmell, Solomon	Geophysics and Geochemistry	Geophysics and Geochemistry	M.S.	1956	Howell Jr., B.F.
Geology of part of the upper Lewistown Valley of Mifflin County, Pennsylvania	Lane, Maurice Vincent	Geology	Geology	M.S.	1956	Nickelsen, R.P.
Recognition of seismic pulses by studies of their frequency spectra	Mathur, Surendra Pratap	Geophysics and Geochemistry	Geophysics and Geochemistry	M.S.	1956	Howell Jr., B.F.
The influence of controlled compositional variation on the hydrothermal stability of synthetic montmorillonoids	Mumpton, Frederick Albert	Geophysics and Geochemistry	Geophysics and Geochemistry	M.S.	1956	Howell Jr., B.F.
A study of trace element distribution in the Chattanooga shale	O'Neil, Robert Lester	Geophysics and Geochemistry	Geophysics and Geochemistry	M.S.	1956	Bates, T.F.
Some Mississippian conodonts from the high resistivity shale of the Nancy Watson no. 1 well in Northeast Mississippi	Stanley, Edward Alexander	Geology	Geology	M.S.	1956	Swartz, Frank M.
Geology of part of the Seven Mountains district of Central Pennsylvania	Thamm, John Kenneth	Geology	Geology	M.S.	1956	Swartz, Frank M.

Subsolidus equilibria in the system Fe3O4-Mn3O4	Van Hook, Harry Jerrold	Geophysics and Geochemistry	Geophysics and Geochemistry	M.S.	1956	Keith, M.L.
A mineralogical study of several hydrous vanadates	Luedemann, Lois Ann (Weiser)	Mineralogy	Mineralogy	Ph.D.	1956	Bates, T.F.
A cross-bedding and stratigraphic study of the Pennsylvanian Middle Kittanning sandstone in Central Pennsylvania	Deike, George H.	Geology	Geology	B.S.	1957	Unknown
An investigation of some relationships between pyrite and uranium in the Chattanooga shale	Dolsen, Charles Philip	Mineralogy	Mineralogy	M.S.	1957	Bates, T.F.
Mineralogical and chemical study of certain shales from the Allegheny formation from Clearfield County, Pennsylvania	Duey, Herbert David	Mineralogy	Mineralogy	M.S.	1957	Bates, T.F.
A technique for determining uranium equilibrium in rock specimens using alpha and fission fragment radiography	Grace, John Dale	Mineralogy	Mineralogy	M.S.	1957	Bates, T.F.
An investigation of the size and shape of quartz grains, Pedro Beach, California	Hulbe, Christoph W. H.	Mineralogy	Mineralogy	M.S.	1957	Krynine, P.D.
The size and proportions of some mineral grains from a beach, Lorraine, Ontario	McIntyre, Donald David	Mineralogy	Mineralogy	M.S.	1957	Griffiths, J.C.
Geology of the Maybrun Mines property, Kenora District, Ontario	Montgomery, Hugh Brinton	Geology	Geology	M.S.	1957	Burnham, C.W.
Some aspects of the petrography of western lignites	Neavel, Richard Charles	Geology	Geology	M.S.	1957	Spackman, William
Lithocharacters and stratigraphy of the Upper New Market, Row Park and Lower Beekmantown beds in the vicinity of Greencastle, Pennsylvania	Palacas, J. G.	Geology	Geology	M.S.	1957	Swartz, Frank M.
The petrography of the Pocono Formation	Shadle, H.W.	Unknown	Unknown	M.S.	1957	Unknown
Size and shape of quartzose pebbles from three New Jersey gravels	Steinmetz, Richard	Mineralogy	Mineralogy	M.S.	1957	Unknown
Frequency dependence of seismic wave attenuation	Andrews, Alday Bishop	Geophysics and Geochemistry	Geophysics and Geochemistry	Ph.D.	1957	Howell Jr., B.F.
Petrology of the Kittanning formation near Brookville, Pennsylvania	Ferm, John Charles	Mineralogy	Mineralogy	Ph.D.	1957	Krynine, P.D.
The mineralogy of glauconite	Warshaw, Charlotte (Marsh)	Geophysics and Geochemistry	Geophysics and Geochemistry	Ph.D.	1957	Keith, M.L.
Stratigraphy of the Allegheny series in the Clearfield Basin	Williams, Eugene Griffin	Geology	Geology	Ph.D.	1957	Swartz, Frank M.; Nickelsen, R.P.
Hydrothermal alteration at Santa Rita, New Mexico	Carpenter, David W.	Geology	Geology	M.S.	1958	Burnham, C.W.
Paleocene miospores from the Slim Buttes area, Harding County, South Dakota	Gerhard, Jacob Esterly	Geology	Geology	M.S.	1958	Kremp, G.O.W.
Petrographic studies of the Clinton carbonate rocks of western New York and the Niagara region of Ontario	Hambleton, Harvey J.	Geology	Geology	M.S.	1958	Nickelsen, R.P.

Frequency analysis of seismic pulses	Huber, Robert Evans	Geophysics and Geochemistry	Geophysics and Geochemistry	M.S.	1958	Howell Jr., B.F.
Geology of some Wollastonite deposits in the eastern Adirondacks, New York	Putman, George Wendell	Geology	Geology	M.S.	1958	Burnham, C.W.
Uranium mineralization in some North and South Dakota lignites	White, Eugene Wilbert	Mineralogy	Mineralogy	M.S.	1958	Bates, T.F.
Subsurface stratigraphy and structure of Mississippian sediments of the Odon East Oil Field, Daviess County, Indiana	Wigginton, William Barclay	Geology	Geology	M.S.	1958	Scholten, Robert
Stratigraphy of the northern belt of the Beekmantown group in southeastern Pennsylvania	Hobson, John Peter	Geology	Geology	Ph.D.	1958	Swartz, Frank M.
Dependence of resistivity of porous sandstones on fluid distribution	Holmes, Charles Robert	Geophysics	Geophysics	Ph.D.	1958	Howell Jr., B.F.
Petrology of the Fountan and Lyons formations along the Colorado front range	Hubert, John F.	Mineralogy and petrology	Mineralogy and petrology	Ph.D.	1958	Krynine, P.D.
The system Mn-O-OH	Klingsberg, Cyrus	Geophysics and Geochemistry	Geophysics and Geochemistry	Ph.D.	1958	Roy, Rustum
Applicability of classical thermodynamics to solid-solid transitions	Majumdar, Amalendu J.	Geochemistry	Geochemistry	Ph.D.	1958	Roy, Rustum
Stability studies of the zircon-thorite group and the effect of related oxides	Mumpton, Frederick Albert	Geochemistry	Geochemistry	Ph.D.	1958	Roy, Rustum
The petrology of the Chipmunk sand and its relationship to reservoir properties	Stanonis, Frank L.	Mineralogy and petrology	Mineralogy and petrology	Ph.D.	1958	Griffiths, J.C.
The relationship among selected minerals, trace elements and organic constituents of several black shales	Strahl, Erwin O.	Mineralogy and petrology	Mineralogy and petrology	Ph.D.	1958	Bates, T.F.
Ground vibrations from a periodic source	Watson, Robert Joseph	Geophysics	Geophysics	Ph.D.	1958	Howell Jr., B.F.
Effect of pressure on conductivity, porosity and permeability of oil-bearing sandstones	Wyble, Donald O.	Geophysics and Geochemistry	Geophysics and Geochemistry	Ph.D.	1958	Howell Jr., B.F.
An economic geographical analysis of Lackawanna County	Wrobel, Theodore	Geography	Geology	B.S.	1959	Unknown
The crystal chemistry of pyrochlore	Aleshin, Eugene	Geochemistry	Geochemistry	M.S.	1959	Roy, Rustum
Resistivity investigations for the location of ground water in the Barrens area of central Pennsylvania	Ansari, A. M. Azheruddin	Geophysics	Geophysics	M.S.	1959	Unknown
Joint orientations of the Appalachian Plateau in southwestern Pennsylvania	Hough, Van Ness Dearborn	Geology	Geology	M.S.	1959	Nickelsen, R.P.
Brachiopods, mollusks, and tentaculitids from the Lower Devonian Shriver chert of central Pennsylvania	Percival, Stephen F.	Geology	Geology	M.S.	1959	Unknown
Stratigraphy of the Lower Kittanning cycle in northwestern Clearfield County, central Pennsylvania	Roberts, John Lenox	Geology	Geology	M.S.	1959	Nickelson, R.P.

Subsolidus studies of the system Li^2O-Al^2O^3-SiO^2-H^2O	Ruiz Menacho, Carmen Maria	Geochemistry	Geochemistry	M.S.	1959	Roy, Rustum
Petrology of graphite-bearing rocks of Chester County, Pennsylvania	Siegrist, Henry Galt	Mineralogy and petrology	Mineralogy and petrology	M.S.	1959	Thornton, C.P.
Distribution of alpha tracks in autoradiographs of some uraniferous base metal sulfide minerals	Smith, Chester Martin	Mineralogy and petrology	Mineralogy and petrology	M.S.	1959	Wright, H.D.
The 1:5 and defect spinels in the system Li^2O-Fe^2O^3-Al^2O^3	Strickler, Donald Ward	Geochemistry	Geochemistry	M.S.	1959	Roy, Rustum
Shoreline sedimentation in New Jersey	Biederman, Edwin Williams	Mineralogy and petrology	Mineralogy and petrology	Ph.D.	1959	Krynine, P.D.
The effect of solid solubility on the synthesis, stability and polytyism of the micas	Crowley, Michael Summers	Geochemistry	Geochemistry	Ph.D.	1959	Roy, Rustum
High-pressure studies of the systems Mg^2 Ge O^4 - Mg^2 $Si0^4$ and GeO^2 - SiO^2 with special reference to the olivine-spinel transition	Dachille, Frank	Geochemistry	Geochemistry	Ph.D.	1959	Roy, Rustum
Stratigraphy of Lower Ordovician Stonehenge and Larke formations in Central Pennsylvania	Donaldson, Alan C.	Geology	Geology	Ph.D.	1959	Swartz, Frank M.
Granitic rocks of the northern portion of the Inyo batholith	Emerson, Donald Orville	Mineralogy and petrology	Mineralogy and petrology	Ph.D.	1959	Tuttle, O.F.
The ternary system MgO-MnO-SiO^2	Glasser, Fredrick Paul	Geophysics and Geochemistry	Geophysics and Geochemistry	Ph.D.	1959	Unknown
Geoelectrical investigations in the Lower Paleozoic of Central Pennsylvania	Gross, Gerardo Wolfgang	Geophysics	Geophysics	Ph.D.	1959	Unknown
Dielectric behavior of rocks and minerals	Licastro, Pasquale H	Geophysics	Geophysics	Ph.D.	1959	Howell Jr., B.F.
Phase equilibria in the system iron oxide-titania-silica	MacChesney, John B.	Geochemistry	Geochemistry	Ph.D.	1959	Maan, A.I.
The petrology of the Blairmore group, Alberta, Canada	Mellon, George Barry	Mineralogy and petrology	Mineralogy and petrology	Ph.D.	1959	Krynine, P.D.
Phase equilibria in the system CaO-FeO-Fe^2O^3-SiO^2	Phillips, Bert	Geochemistry	Geochemistry	Ph.D.	1959	Muan, A.I.; Osborn, E.F.
The distribution of seismic wave energy at a free surface	Ryan, John Arthur	Geophysics	Geophysics	Ph.D.	1959	Howell Jr., B.F.
Subsolidus studies in the system $NaAlSiO^4$-$NaAlSi^3O^8$-H^2O	Saha, Prasenjit	Geochemistry	Geochemistry	Ph.D.	1959	Tuttle, O.F.
The ternary system Ag^2S-Bi^2S^3-PbS	Van Hook, Harry Jerrold	Geochemistry	Geochemistry	Ph.D.	1959	Tuttle, O.F.
Subsolidus Equilibria in the System Fe3O4-Mn3O4	VanHook, Harry J.	Geophysics and geochemistry	Geophysics and geochemistry	Ph.D.	1959	Unknown
Flood plain sedimentation of Halfmoon Creek	Adler, Alan A.	Geology	Geology	M.S.	1960	Lattman, L.H.
Maceral segregation in commercially prepared coal products	Bayer, James Lawrence	Geology	Geology	M.S.	1960	Spackman Jr., William
Glacial geology of northern Montour and Northumberland counties, Pennsylvania between north and west branches of Susquehanna River	Brinkley, Charles Alexander	Geology	Geology	M.S.	1960	Swartz, Frank M.

The sampling problem in sedimentary petrography; a contribution	Cochran, John A.	Mineralogy and petrology	Mineralogy and petrology	M.S.	1960	Griffiths, J.C.
Ostracodes of the Glenerie limestone at Catskill, New York	Sohon, Robert S.	Geology	Geology	M.S.	1960	Swartz, Frank M.
Pleistocene geology of Union County, Pennsylvania	Wells, James Aertsen	Geology	Geology	M.S.	1960	Lattman, L.H.
Physical, chemical and thermal properties of selected vitrinitic substances	Dutcher, Russell Richardson	Geology	Geology	Ph.D.	1960	Spackman Jr., William
Experimental studies bearing on the origin of pseudoleucite and associated problems of alkaline rock systems	Fudali, Robert F.	Geochemistry	Geochemistry	Ph.D.	1960	Tuttle, O.F.
Petrology of the Vaqueros formation near Gaviota, California	Grender, Gordon Conrad	Mineralogy and petrology	Mineralogy and petrology	Ph.D.	1960	Krynine, P.D.
Geochemistry and mineralogy of the zoisite-epidote group	Rapp, George Robert	Geochemistry	Geochemistry	Ph.D.	1960	Tuttle, O.F.
Phase relations in the Mg^2SiO^4-$CaAl^2Si^2O^8$-FeO-Fe^2O^3-SiO^2 system and their bearing on crystallization of basaltic magma	Roeder, Peter L.	Geochemistry	Geochemistry	Ph.D.	1960	Osborn, E.F.
Subsolidus studies in the system $CaCO^3$-$MgCO^3$-$FeCO^3$-$MnCO^3$	Rosenberg, Philip E.	Geochemistry	Geochemistry	Ph.D.	1960	Osborn, E.F.
Relationships between uranium and some other trace elements in pyrite, galena, and sphalerite from vein deposits	Shulhof, William Peter	Mineralogy and petrology	Mineralogy and petrology	Ph.D.	1960	Wright, H.D.
Upper Cretaceous and Lower Tertiary sporomorphae from Northwestern South Dakota	Stanley, Edward Alexander	Geology	Geology	Ph.D.	1960	Spackman Jr., William
Pressure-temperature univariant equilibria of some reactions in the system, CaO-MgO-SiO^2-CO^2	Walter, Louis Simon	Geochemistry	Geochemistry	Ph.D.	1960	Tuttle, O.F.
A comparison of three quartzites	Wood, George V.	Mineralogy and petrology	Mineralogy and petrology	Ph.D.	1960	Griffiths, J.C.
Determination of specific capacities in a multiaquifer well	Bennett, Gordon D.	Geophysics	Geophysics	M.S.	1961	Crowe, Christopher
Rb-Sr age determinations of lepidolites by x-ray fluorescence and isotope dilution	Berman, Roslyn.	Geochemistry	Geochemistry	M.S.	1961	Herzog, L.F.
The artificial coalification of wood samples of Taxodium distichum (L.) Rich	Davis, Alan	Geology	Geology	M.S.	1961	Spackman Jr., William
Rubidium-strontium age determinations of muscovites and biotites from pegmatites of the Blue Ridge and Piedmont	Deuser, Werner G.	Geochemistry	Geology	M.S.	1961	Herzog, L.F.
Carbon and oxygen isotope ratios in marine and fresh-water mollusc shells	Eichler, Roland.	Geochemistry	Geochemistry	M.S.	1961	Keith, M.L.
The geology of part of South Mountain of the Blue Ridge Province north of the Pennsylvania-Maryland border	Farlekas, George M.	Geology	Geology	M.S.	1961	Scholten, Robert
Sporomorphae of the Brookville Seam near Brookville, Pennsylvania	Frederiksen, Norman Oliver	Geology	Geology	M.S.	1961	Spackman Jr., William
A detailed gravity survey in the Triassic basin, North Chester County, Pennsylvania	Ghaffar-Adly, Rahmat	Geophysics	Geophysics	M.S.	1961	Crowe, Christopher
Geology of the southern part of the Leador Quadrangle, east-central Idaho	Knowles, Raymond Robert	Geology	Geology	M.S.	1961	Scholten, Robert
Glacial geology of northeastern Tioga County, Pennsylvania	Lifschutz, Arthur Paul	Geology	Geology	M.S.	1961	Lattman, L.H.

Fracture trace and joint patterns in western Centre County, Pennsylvania	Matzke, Richard H.	Geology	Geology	M.S.	1961	Lattman, L.H.
A preliminary investigation into the application of coal petrography in the blending of anthracite and bituminous coals for the production of metallurgical coke	Middleton, Bruce Donald	Geology	Geology	M.S.	1961	Spackman, William
Quantitative x-ray determination of phases in fired whiteware bodies and their shrinkage and porosity characteristics	Ougland, Ronald M.	Mineralogy	Mineralogy	M.S.	1961	Brindley, G.W.
An investigation of jarosite found in some radioactive lignites	Savanick, George Adrian	Mineralogy and petrology	Mineralogy and petrology	M.S.	1961	Bates, T.F.
A detailed magnetic survey in the Triassic Basin, North Chester County, Pennsylvania	Shank, John C.	Geophysics	Geophysics	M.S.	1961	Crowe, Christopher
The geology of the Clear Creek area, Montana-Idaho	Smith, Jan G.	Geology	Geology	M.S.	1961	Scholten, Robert
Some petrological aspects of the Harbour Seam, Sydney Coalfield, Nova Scotia	Cameron, Alexander Rankin	Geology	Geology	Ph.D.	1961	Spackman Jr., William
Phase-equilibriuM.S.tudies on tektite and meteorite systems	Cassidy, William Arthur	Geochemistry	Geochemistry	Ph.D.	1961	Osborn, E.F.
Phase-equilibrium studies on tektite and meteorite systems	Cassidy, William Arthur	Geochemistry	Geochemistry	Ph.D.	1961	Osborn, E.F.
Order-disorder in spinels	Datta, Ranajit Kumar	Geochemistry	Geochemistry	Ph.D.	1961	Roy, Rustum
Middle Devonian Mahantango formation in parts of south-central Pennsylvania	Ellison, Robert Lee	Geology	Geology	Ph.D.	1961	Swartz, Frank M.
X-Ray studies of calcium-chloride-schabazite and dehydrated natrolite	Fang, Jen-Ho	Geochemistry	Geochemistry	Ph.D.	1961	McKinstry, H.A.; Burnham, C.W.
Effect of fluid content on the absorption of elastic waves in sandstone	Fish, Ferol F.	Geophysics	Geophysics	Ph.D.	1961	Howell Jr., B.F.
Experimental hydrothermal studies bearing on rock weathering and clay mineral formation	Hawkins, D. B. (Daniel Ballou)	Geochemistry	Geochemistry	Ph.D.	1961	Roy, Rustum
Mineralogical and chemical variations in the kaolin deposits of the coastal plain of Georgia and South Carolina	Hinckley, David Narwyn	Mineralogy and petrology	Mineralogy and petrology	Ph.D.	1961	Bates, T.F.
A study of the incorporation of uranium by synthesized crystals of lead sulfide	Hutta, Joseph John	Mineralogy	Mineralogy	Ph.D.	1961	Wright, H.D.
Variation in chemical composition of rock bodies : metabasalts in the Iron Springs Quadrangle, South Mountain, Pennsylvania	Landy, Richard Allen	Mineralogy and petrology	Mineralogy and petrology	Ph.D.	1961	Griffiths, J.C.
Interrelations among petrographic, textural, and oil reservoir properties in the chipmunk sandstone	Pachman, Jerrold Marvin	Mineralogy and petrology	Mineralogy and petrology	Ph.D.	1961	Griffiths, J.C.
A study of the distribution of trace elements in some igneous rocks of northwestern and central Arizona	Putman, George Wendell	Geology	Geology	Ph.D.	1961	Burnham, C.W.
Multivariate statistical study of two sandstones	Siegrist, Henry Galt	Mineralogy and petrology	Mineralogy and petrology	Ph.D.	1961	Griffiths, J.C.
An experimental study of the system FeO-$Fe^{2}O^{3}$-TiO^{2} and its bearing on mineralogical problems	Taylor, Robert W.	Geochemistry	Geochemistry	Ph.D.	1961	Maun, Arnulf; Osborn, E.F.

Lithostratigraphy of the Middle Ordovician Salona and Coburn formations of the Trenton group in central Pennsylvania	Thompson, Richard Rogers	Geology	Geology	Ph.D.	1961	Swartz, Frank M.
Phase equilibrium and crystal chemical relationships in rare earth systems	Warshaw, Israel	Geochemistry	Geochemistry	Ph.D.	1961	Roy, Rustum
Gravity investigations in northeastern and central Pennsylvania	Ackermann, Hans D.	Geophysics	Geophysics	M.S.	1962	Spackman Jr., William
Maceral and mineral concentrations in chance cone products	Benedict, Louis G.	Geology	Geology	M.S.	1962	Spackman Jr., William
Alluvial chromite deposits of southern Chester and Lancaster Counties, Pennsylvania	Dunn, Peter Ayres	Geology	Geology	M.S.	1962	Lattman, L.H.
Geology of South Mountain, northwestern Adams County, Pennsylvania	Fauth, John L.	Geology	Geology	M.S.	1962	Scholten, Robert
A study of photogeologic fracture traces over the Bisbee Quadrangle, Cochise County, Arizona	Keim, James Will	Geology	Geology	M.S.	1962	Lattman, L.H.
Minor elements in magnetite from central and northwestern Arizona	MacKenzie, George Donald	Geology	Geology	M.S.	1962	Burnham, C.W.
Ostracoda of the Upper Cretaceous Selma group near Tupelo, Mississippi	McEachern, Slater E.	Geology	Geology	M.S.	1962	Swartz, Frank M.
A transient heat-flow method for determination of thermal constants	Moench, Allen F.	Geophysics	Geophysics	M.S.	1962	Crowe, Christopher
Effect of sample size on determination of thermal conductivity by modified hot-wire method	Taylor, Patrick T.	Geophysics	Geophysics	M.S.	1962	Crowe, Christopher
The spores and pollen of the Potomac group of Maryland	Brenner, Gilbert J.	Geology	Geology	Ph.D.	1962	Spackman Jr., William
Densification of glass at very high pressures	Cohen, Howard Melvin	Geochemistry	Geochemistry	Ph.D.	1962	Roy, Rustum
The crystal structure of proto-amphibole	Gibbs, Gerald V.	Mineralogy and petrology	Mineralogy and petrology	Ph.D.	1962	Griffiths, J.C.
Model studies of the effects of near-source velocity discontinuities on the first-motion patterns of P and S around different force systems	Lavin, Peter M.	Geophysics	Geophysics	Ph.D.	1962	Howell Jr., B.F.
A trace element study of selected sulfide minerals from the eastern United States	Lenker, Earle Scott	Geology	Geology	Ph.D.	1962	Burnham, C.W.
Experimental investigations of epidote paragenesis	Merrin, Seymour	Geochemistry	Geochemistry	Ph.D.	1962	Burnham, C.W.
Geology of the Eighteenmile Peak area and petrology of the Beaverhead pluton, Idaho-Montana	Ramspott, Lawrence D.	Geology	Geology	Ph.D.	1962	Scholten, Robert
Effect of simulated overburden pressure on the resistivity, porosity and permeability of selected sandstones	Redmond, John Charles	Geophysics	Geophysics	Ph.D.	1962	Howell Jr., B.F.
Crystal chemical relations in the P zeolite group	Taylor, Allan Maurice	Geochemistry	Geochemistry	Ph.D.	1962	Scheffer, I.M.
Phase relations in the system lead-oxygen	White, William B. (William Blaine)	Geochemistry	Geochemistry	Ph.D.	1962	Roy, Rustum
The formation and dispersal of shells in a shoreline system of sedimentation	Barker, R. M. (Richard M.)	Mineralogy and petrology	Mineralogy and petrology	M.S.	1963	Krynine, P.D.
Geology and petrology of the Rainy Creek intrusive near Libby, Montana	Boettcher, Arthur Lee	Geology	Geology	M.S.	1963	Wright, L.A.
The hydro-geology of the sewage disposal experiment area, northwest of State College, Pennsylvania	Caruccio, Frank Thomas	Geology	Geology	M.S.	1963	Parizek, R.R.
Distribution of certain elements in four areas of hydrothermal alteration	Crawford, Samuel W.	Geology	Geology	M.S.	1963	Burnham, C.W.

Phase relations in the system lead oxide-carbide dioxide	Grisafe, David Anthony	Geochemistry	Geochemistry	M.S.	1963	Roy, Rustum
Point bar sedimentation on Halfmoon Creek, Pennsylvania	Hedberg, William H.	Geology	Geology	M.S.	1963	Lattman, L.H.
Geology of a portion of the Lemhi Range and Birch Creek Basin, Lemhi, Clark, and Butte Counties, Idaho	Huh, Oscar Karl	Geology	Geology	M.S.	1963	Scholten, Robert
Geology of the Morrison Lake area, Montana-Idaho	Koesters, Baerbel	Geology	Geology	M.S.	1963	Scholten, Robert
Geology of the Graphite Mountain-Tepee Mountain Area Montana-Idaho	Landis, Charles A.	Geology	Geology	M.S.	1963	Scholten, Robert
The geology of the Gatesburg formation in the Bellefonte quadrangle, Pennsylvania, and its relationship to the general occurrence and movement of ground water	Landon, Ronald Arthur	Geology	Geology	M.S.	1963	Deasy, G.F.
A gravity survey in the Triassic Lowlands, Berks and north Chester Counties, Pennsylvania	Miller, Harold Ellis	Geophysics	Geophysics	M.S.	1963	Crowe, Christopher; Lavin, Peter M.
Statistical analysis applied to the petrographic and reservoir properties of the "first Venango oil sand", Warren County, Pennsylvania	Modarresi, Hassan G.	Geology	Geology	M.S.	1963	Griffiths, J.C.
Detailed electrical surveys in the Triassic Basin, north Chester County, Pennsylvania	Ross, Howard P.	Geophysics	Geophysics	M.S.	1963	Crowe, Christopher
Experimental hydrothermal alteration of a quartz monzonite porphyry	Trafton, Burke O.	Geochemistry	Geochemistry	M.S.	1963	Burnham, C.W.
The crystallization ranges of the Spruce Pine and Harding pegmatites	Vaughan, David E. W.	Geochemistry	Geochemistry	M.S.	1963	Burnham, C.W.
Geology and coal metamorphism by dacite in the Chiufen Gold Mine, northern Taiwan	Wang, Yuan	Geology	Geology	M.S.	1963	Dutcher, R.R.
The thermal behavior of coal constituents	Berry, William F.	Geology	Geology	Ph.D.	1963	Spackman Jr., William
The effects of temperature and water pressure on the apparent Rb-Sr age of micas	Deuser, Werner G.	Geochemistry	Geology	Ph.D.	1963	Herzog, L.F.
Mineralogical, petrographic, and geochemical relationships in some high-alumina and associated claystones from the Clearfield Basin, Pennsylvania	Erickson, Edwin S.	Mineralogy and petrology	Mineralogy and petrology	Ph.D.	1963	Bates, T.F.
The system $KAlSiO^4$-Mg^2SiO^4-H^2O from 500 to 3000 bars and 800 0 to 1200 0 C.and its petrologic significance	Luth, William Clair	Geochemistry	Geochemistry	Ph.D.	1963	Tuttle, O.F.
Frequency spectra of refraction arrivals and the nature of the Mohorovičić discontinuity	Nakamura, Yosio	Geophysics	Geophysics	Ph.D.	1963	Howell Jr., B.F.
Seismic model studies of first motions produced by an actual fault	Pfluke, John Henry	Geophysics	Geophysics	Ph.D.	1963	Howell Jr., B.F.
The join Mg_2SiO_4-$CaMgSi_2O_6$-iron oxide at oxygen pressures from 0.21 to 10^{-8} atmospheres	Presnall, Dean Carl	Geochemistry	Geochemistry	Ph.D.	1963	Osborn, E.F.
The geology of plancha L-12 (Peralonso-Medina area) of the geologic map of Colombia	Segovia Nerhot, Antonio Valentin	Geology	Geology	Ph.D.	1963	Lattman, L.H.
Palyno-botanical and stratigraphic studies of three lignite drill cores (Paleocene) from Harding County, South Dakota	Trotter, Charles Leonard	Geology	Geology	Ph.D.	1963	Spackman Jr., William

Morphologic classification of sponge spicules, with descriptions of siliceous spicules from the Lower Ordovician Bellefonte dolomite in Central Pennsylvania	Butler, Phillip Edward	Geology	Geology	M.S.	1964	Swartz, Frank M.
Statistical analysis of petrographic variability in a graded bed	Dahlberg, Eric C.	Mineralogy and petrology	Mineralogy and petrology	M.S.	1964	Griffiths, J.C.
Instrumental factors limiting the precision and acuracy of strontium isotopic composition measurements	Deines, Peter	Geochemistry	Geochemistry	M.S.	1964	Herzog, L.F.
Intercorrelations between petrographic and reservoir properties in the Cow Run sand, Wirt County, West Virginia	Drew, Lawrence J.	Mineralogy and petrology	Mineralogy and petrology	M.S.	1964	Griffiths, J.C.
A trace-element study of some hypersolvus and subsolvus granites	Durisek, E. Jane	Mineralogy	Mineralogy	M.S.	1964	Tuttle, O.F.
A study of the Lower Kittanning underclay near Curwensville, Pennsylvania	McCarl, Henry Newton	Geology	Geology	M.S.	1964	Williams, E.G.
Estimation procedure for focal-depth determination of seismic disturbances	Merdler, Stephen C.	Geophysics	Geophysics	M.S.	1964	Watson, R.J.
Model studies for focal-depth determination at near-source stations	Rothman, Robert L.	Geophysics	Geophysics	M.S.	1964	Lavin, P.M.
Structural geology of the western flank of the Elkins Valley anticline, Elkins area West Virginia	Ujueta, Guillermo	Geology	Geology	M.S.	1964	Lattman, L.H.
The geochemistry and petrology of the Vanport limestone, Western Pennsylvania	Bergenback, Richard Edward	Geology	Geology	Ph.D.	1964	Williams, E.G.
Geology of northwestern Pictou County, Nova Scotia, Canada	Gillis, John William	Geology	Geology	Ph.D.	1964	Scholten, Robert
Hydrodynamics of beach and dune sedimentation	Hand, Bryce Moyer	Geology	Geology	Ph.D.	1964	Williams, E.G.
Sedimentary geology of La Sierra formation (Eocene) and Sierra de Perija, Venezuela	Hea, James Paul	Geology	Geology	Ph.D.	1964	Krynine, P.D.; Scholton, Robert
Geology of the Bedford-Everett-Saxton area, Bedford County, Pennsylvania	Knowles, Raymond Robert	Geology	Geology	Ph.D.	1964	Lattman, L.H.
Stratigraphy of the Lower Ordovician Axemann limestone of the Beekmantown group in central Pennsylvania	Lees, John Allen	Geology	Geology	Ph.D.	1964	Swartz, Frank M.
Geology and origin of the iron ore deposits of the Zenith Mine, Ely, Minnesota	Machamer, Jerome Frank	Geology	Geology	Ph.D.	1964	Ridge, John D.
The geology, mineralogy, petrology and geochemistry of the state line serpentinite and associated chromite deposits	McKague, Herbert Lawrence	Mineralogy and petrology	Mineralogy and petrology	Ph.D.	1964	Ridge, John D.
Petrography of the Catskill sandstone facies in central Pennsylvania	Meyer, Harvey John	Mineralogy and petrology	Mineralogy and petrology	Ph.D.	1964	Griffiths, J.C.
Geohydrology of the Mercer quadrangle in northwest Pennsylvania	Poth, Charles W.	Geology	Geology	Ph.D.	1964	Lattman, L.H.
Phase equilibria and crystal chemistry of cement and refractory phases in the system CaO-MgO-Al_2O_3-Fe_2O_3-CaF_2-P_2O_5-SiO_2	Schlaudt, Charles McCammon	Geochemistry	Geochemistry	Ph.D.	1964	Roy, Della M.

Quantitative petrographic comparison of the Bradford Third and Lewis Run sands	Smith, Chester Martin	Mineralogy and petrology	Mineralogy and petrology	Ph.D.	1964	Griffiths, J.C.
Element distribution among coexisting phases in the system MgO-FeO-Fe^2O^3-SiO^2-TiO^2 as a function of temperature, oxygen fugacity, and bulk composition	Speidel, David Harold	Geochemistry	Geochemistry	Ph.D.	1964	Osborn, E.F.
Oxidation-reduction reactions and equilibrium phase relations at 1300 åt oxygen pressures from 0.21 to 10^{-14} atmospheres for the spinel solid solution series $FeCr^2O^4$-$MgCr^2O^4$ and $FeAl^2O^4$-$MgAl^2O^4$	Ulmer, Gene Carlton	Geochemistry	Geochemistry	Ph.D.	1964	Osborn, E.F.
A kinetic study of the evolution of carbon dioxide from an aqueous solution	Bubek, Robert Clayton	Geology	Geology	M.S.	1965	Schmalz, R.F.
The geology of the ordovician carbonate formations in the State College, Pennsylvania area and their relationships to the general occurrence and movement of ground water	Clark, John Harris	Geology	Geology	M.S.	1965	Parizek, R.R.
Decomposition of seismograms by orthonormal expansion and matched filter approximations	Elbel, William P.	Geophysics	Geophysics	M.S.	1965	Watson, R.J.
Geophysical investigation of a magnetite deposit, Chester County, Pennsylvania	Gedde, Roger W.	Geophysics	Geophysics	M.S.	1965	Lavin, P.M.
Solubility studies of selected chalcophile elements in hydrothermally synthesized galena	Halbig, Joseph B.	Mineralogy and petrology	Mineralogy and petrology	M.S.	1965	Wright, H.D.
Petrography of the Dunn Brook formation and geology of the Carlisle Pond area, Maine	Hanson, Henry W. A.	Geology	Geology	M.S.	1965	Scholten, Robert
Petrographic composition and sulfur content of selected Pennsylvania bituminous coal seams	Mansfield, S. P.	Geology	Geology	M.S.	1965	Spackman, William
Control of nucleation, crystal growth, and doping of various calcium carbonate phases by the gel technique	McCauley, James Weymann	Mineralogy and petrology	Mineralogy and petrology	M.S.	1965	Roy, Rustum
Statistical comparison of the Keener and Big Injun sands, Pleasants County, West Virginia	Ondrick, Charles William	Mineralogy and petrology	Mineralogy and petrology	M.S.	1965	Griffiths, J.C.
Experimental study of rocks from a zoned pluton	Piwinskii, Alf J.	Geochemistry	Geochemistry	M.S.	1965	Wyllie, P.J.
Distribution of certain elements in the major rock units at the Cornwall and Morgantown mines, Pennsylvania	Popovich, Daniel Eugene	Geology	Geology	M.S.	1965	Burnham, C.W.
Petrography of the bedrock and breccia erratics in the region of Lac Couture, Quebec	Robertson, P. Blyth	Mineralogy and petrology	Mineralogy and petrology	M.S.	1965	Thornton, C.P.
In situ determination of the remanent magnetic vector of two-dimensional tabular bodies	Ross, Howard P.	Geochemistry	Geochemistry	M.S.	1965	Lavin, P.M.; Howell Jr., B.F.
Complexes of water and some simple n-alkyl compounds with a synthetic montmorillonite	Thompson, Thomas Dick	Geochemistry	Geochemistry	M.S.	1965	Brindley, G.W.
Heavy mineral distribution in stream gravels in the Sandy Springs, Maryland and Kensington, Maryland 7 1/2' quadrangles	Turner, William Morrow	Geology	Geology	M.S.	1965	Ridge, John D.

Geology of the Limekiln Canyon and Four Eyes Canyon areas, Southwesternmost Montana	Witte, Hermann C.	Geology	Geology	M.S.	1965	Scholten, Robert
Alkali metasomatism related to the pinos altos pegmatite body, Rio Arriba County, New Mexico	Young, Davis A.	Mineralogy and petrology	Mineralogy and petrology	M.S.	1965	Jahns, R.H.
Solubilities of selected chalcophile elements in hydrothermally synthesized [beta]-ZnS (Sphalerite)	Barnard, Walther M.	Mineralogy	Mineralogy	Ph.D.	1965	Wright, H.D.
Modal analysis of the granitic rocks of the Northern Sierra Nevada between Yosemite and Lake Tahoe, California	Coatney, Richard Lee	Mineralogy and petrology	Mineralogy and petrology	Ph.D.	1965	Tuttle, O.F.
Melting relationships in the system CaO-MgO-SiO^2-CO^2-H^20: a study of synthetic kimberlites	Franz, Gilbert Wayne	Geochemistry	Geochemistry	Ph.D.	1965	Klein, P.S.
Composition and crystallization history of the conway granite of New Hampshire	Frye, John Keith	Geochemistry	Geochemistry	Ph.D.	1965	Jahns, R.H.
Distribution of spore and pollen assemblages in the lower kittanning coal of western Pennsylvania	Habib, Daniel	Geology	Geology	Ph.D.	1965	Spackman Jr., William
Structure of the Gilmore area, Lemhi range, Idaho	Hait, Mortimer H.	Geology	Geology	Ph.D.	1965	Scholten, Robert
Petrology of the upper ordovician and lower silurian rocks in the central Appalachians	Horowitz, Daniel Henry	Geology	Geology	Ph.D.	1965	Williams, E.G.
A model for debris flow	Johnson, Arvid Mauritz	Geology	Geology	Ph.D.	1965	Jahns, R.H.
Structure of the Maiden Peak area, Montana-Idaho	M'Gonigle, John W.	Geology	Geology	Ph.D.	1965	Scholten, Robert
The inselbergs of Southwestern Arizona	Rahn, Perry Hendricks	Geology	Geology	Ph.D.	1965	Lattman, L.H.
Bedrock geology of the Great Barrington area, Massachusetts	Ratcliffe, Nicholas Morley	Geology	Geology	Ph.D.	1965	Jahns, R.H.
Palynology of environments of peat formation in Southwestern Florida	Riegel, Walter Leonard	Geology	Geology	Ph.D.	1965	Spackman, William
Emplacement mechanism of the Miraleste tuff, Palos Verdes Hills, California	Schleicher, David	Geology	Geology	Ph.D.	1965	Jahns, R.H.
Stratigraphy of lower ordovician Nittany dolomite in Central Pennsylvania	Spelman, Allen Rothjen	Geology	Geology	Ph.D.	1965	Swartz, Frank M.
The upper three-phase region in a portion of the system $KAlSi^2O^6$-SiO^2-H^2O at water pressures from two to seven kilobars	Spengler, Charles Joseph	Geochemistry	Geochemistry	Ph.D.	1965	Burnham, C.W.
Late-glacial and post-glacial vegetational history in the North Central Appalachian region	Stingelin, Ronald Werner	Geology	Geology	Ph.D.	1965	Spackman, William
Melting relationships in parts of the system Na_2O-K_2O-CaO-Al_2O_3-SiO_2-CO_2-H_2O with applications to carbonate and alkalic rocks	Watkinson, David Hugh	Geochemistry	Geochemistry	Ph.D.	1965	Wyllie, P.J.
Geomorphology of a portion of the Northern coastal plain of Puerto Rico	Williams, Richard S.	Geology	Geology	Ph.D.	1965	Lattman, L.H.
Estimation of the depth of focus of the May 10, 1963 Ecuador earthquake	Cheng, Yung-Yu	Geophysics	Geophysics	M.S.	1966	Lavin, P.M.
Interpretation of magnetic anomalies in the Dillsburg area, York County, Pennsylvania	Coleman, K. Fred	Geophysics	Geophysics	M.S.	1966	Lavin, P.M.
Grid Drilling Exploration and its application to the search for petroleum	Drew, Lawrence James	Mineralogy and petrology	Mineralogy and petrology	M.S.	1966	Griffiths, J.C.

The pleistocene geology of the Brodheadsville and Pohopoco mountain (7.5') quadrangles, Pennsylvania	Gardner, Leonard Robert	Geology	Geology	M.S.	1966	Parizek, R.R.
Late-glacial and post-glacial vegetational changes in the Conneaut Marsh region, Northwestern Pennsylvania	Groth, Linda Williamson	Geology	Geology	M.S.	1966	Spackman Jr., William
Palynological delineation of environments in the Columbiana shale of Western Pennsylvania	Groth, Peter K. H.	Geology	Geology	M.S.	1966	Dutcher, R.R.
An electron optical study of the structure and morphology of sepiolite and palygorskite	Irving, Stephen Myles	Mineralogy and petrology	Mineralogy and petrology	M.S.	1966	Brindley, George
The investigation of photogeologic fracture traces by electrical prospecting methods	Johnson, Philip W.	Geophysics	Geophysics	M.S.	1966	Lattman, L.H.; Howell Jr., B.F.
An experimental study of redistribution of base-metals in hydrothermally altered rocks	Kilinc, I. Attila	Geology	Geology	M.S.	1966	Burnham, C.W.
A study of the Watson-Merdler method for focal-depth determination of seismic disturbances from underground nuclear explosions	Lin, Jin-Long	Geophysics	Geophysics	M.S.	1966	Howell Jr., B.F.
A chemical and petrographic study of the granitic rocks of New Brunswick, Canada	Martin, Robert F. C.	Geochemistry	Geochemistry	M.S.	1966	Keith, M.L.
Spectral estimation of signal and noise power and power ratios for reflection seismograms	Ostrander, William J.	Geophysics	Geophysics	M.S.	1966	Alexander, Shelton S.
The relationship between sulfur distribution and paleotopography in three selected coal seams of western Pennsylvania	Reidenouer, David Raymond	Geology	Geology	M.S.	1966	Williams, E.G.; Dutcher, R.R.
Seismic model study of refraction arrivals in a three-layered structure	Siskind, David Eugene	Geophysics	Geophysics	M.S.	1966	Howell Jr., B.F.
A study in fluvial sedimentation using settling velocity techniques	White, James R.	Geology	Geology	M.S.	1966	Williams, E.G.
Flux growth of single crystal R^2O^3 oxides with the corunduM.S.tructure	Barks, Ronald E.	Geochemistry	Geochemistry	Ph.D.	1966	Roy, Della M.
Flux growth of single crystal R^2O^3 oxides with the corundum structure	Barks, Ronald E.	Geochemistry	Geochemistry	Ph.D.	1966	Roy, Della M.
Phase equilibriuM.S.tudies of germanium and silicon at high pressures	Bates, Carl Hobart	Geochemistry	Geochemistry	Ph.D.	1966	Dachille, Frank
Phase equilibrium studies of germanium and silicon at high pressures	Bates, Carl Hobart	Geochemistry	Geochemistry	Ph.D.	1966	Dachille, Frank
The Rainy Creek igneous complex near Libby, Montana	Boettcher, Arthur Lee	Geology	Geology	Ph.D.	1966	Wright, L.A.
The geology of the Western limb of the Hazara-Kashmir syntaxis, West Pakistan and Kashmir	Calkins, James A.	Geology	Geology	Ph.D.	1966	Lattman, L.H.
Mineralogy and petrology of the Andersonville, Georgia, bauxite district	Flock, William M.	Mineralogy and petrology	Mineralogy and petrology	Ph.D.	1966	Bates, T.F.
Solubility of iron in solutions coexisting with pyrite from 25 0 to 250 0 C, with geologic implications	Haas, John Lewis	Geochemistry	Geochemistry	Ph.D.	1966	Barnes, H.L.
Structure of the Hawley Creek area, Idaho Montana	Koesters, Baerbel	Geology	Geology	Ph.D.	1966	Unknown
Spectral analysis of short-period first arrivals of the April 13, 1963 Peruvian earthquake	Leblanc, Gabriel	Geophysics	Geophysics	Ph.D.	1966	Howell Jr., B.F.

Structure of the Hawley Creek area, Idaho-Montana	Lucchitta, Baerbel Koesters	Geology	Geology	Ph.D.	1966	Scholten, Robert
Equilibrium phase compositions and thermodynamic properties of solid solutions in the system MgO-"FeO"-SiO^2	Nafziger, Ralph Hamilton	Geochemistry	Geochemistry	Ph.D.	1966	Maun, Arnulf
Sulfur in coal: its distribution in the seam and in mine products	Neavel, Richard Charles	Geology	Geology	Ph.D.	1966	Spackman, William
Ostracodes from the Middle Ordovician Nealmont limestone of central Pennsylvania	Nickey, David Allen	Geology	Geology	Ph.D.	1966	Swartz, Frank M.
Petrographic properties influencing porosity and permeability in the carbonate-quartz system as represented by the Gatesburg formation	Smith, Richard Elbridge	Geology	Geology	Ph.D.	1966	Wright, H.D.; Parizek, R.R.
Some factors affecting the geologic interpretation of aerial photographs	Ciciarelli, John Anthony	Geology	Geology	M.S.	1967	Lattman, L.H.
A petrologic study of a thermally altered coal from the Purgatoire river valley of Colorado	Crelling, John Crawford	Geology	Geology	M.S.	1967	Dutcher, R.R.
The petrology and geochemistry of the Clarion flint clay, western Pennsylvania	Falla, WilliaM.S..	Geology	Geology	M.S.	1967	Williams, E.G.
Geology of a portion of the Allensville 15' quadrangle, Pennsylvania	Flueckinger, Linda Ann	Geology	Geology	M.S.	1967	Dutcher, R.R.
A six degree of freedom model for a near earth satellite	Jasper, Peter E.	Engineering Science	Earth Science	M.S.	1967	Richard E. Llorens
Geology and origin of the Woods creek iron deposit, Ravalli County, Montana	Kelley, William N.	Geology	Geology	M.S.	1967	Ridge, John D.; Wright, L.A.
Time series analysis as applied to continental margin refraction data	Merkel, Richard H.	Geophysics	Geophysics	M.S.	1967	Alexander, Shelton S.
Petrography and mineralogy of a "Rapakivi," quartz monznite pluton, Eagle Mountain quadrangle, California	Novak, Gary A.	Mineralogy and petrology	Mineralogy and petrology	M.S.	1967	Thornton, C.P.
A study of the faunal succession found in the Cerro Gordo member of the lime creek formation at Rockford and Bird Hill, north-central Iowa	Williams, Robert Bruce	Geology	Geology	M.S.	1967	Guber, A.L.
An Evaluation of Factors Influencing Acid mine drainage production from various strata of the Allegheny group and the ground water interactions in selected areas of western Pennsylvania.	Caruccio, Frank Thomas	Geology	Geology	Ph.D.	1967	Parizek, R.R.; Williams, E.G.
Structural geomorphology of a portion of the Wills mountains anticlinorium, Mineral and Grant counties, West Virginia	Clark, George Michael	Geology	Geology	Ph.D.	1967	Unknown
A multivariate study of some aspects of trace metals in streaM.S.ediments as guides to locating mineral deposits	Dahlberg, Eric C.	Mineralogy and petrology	Mineralogy and petrology	Ph.D.	1967	Griffiths, J.C.; Keith, L.C.
A multivariate study of some aspects of trace metals in stream sediments as guides to locating mineral deposits	Dahlberg, Eric C.	Mineralogy and petrology	Mineralogy and petrology	Ph.D.	1967	Griffiths, J.C.; Keith, L.C.
The development of caverns of the Mammoth Cave region	Deike, George Herman	Geology	Geology	Ph.D.	1967	Lattman, L.H.
Stable carbon and oxygen isotopes of carbonatte carbonates and their interpeetation	Deines, Peter	Geochemistry and Mineralogy	Geochemistry	Ph.D.	1967	Herzog, L.F.
Geology of the Caledonia Park Area South mountain, Pennsylvania	Fauth, John L.	Geology	Geology	Ph.D.	1967	Scholten, Robert

Cenozoic geology of the Upper Lake Mead area adjacent to the Grand Wash Cliffs, Arizona	Lucchitta, Ivo	Geology	Geology	Ph.D.	1967	Jahns, R.H.
The crystal structure and polymorphism of cordierite	Meagher, Edward P.	Mineralogy and petrology	Mineralogy and petrology	Ph.D.	1967	Newnham, R.E.
Polymorphism of TiO^2 minerals	Simons, Philip Yale	Mineralogy and petrology	Mineralogy and petrology	Ph.D.	1967	Dachille, Frank
The petrology of the Lower Kittanning coal in western Pennsylvania	Ting, Francis Ta-Chuan	Geology	Geology	Ph.D.	1967	Spackman, William
Geologic factors influencing well yields in a folded sandstone-siltstone-shale terrane within the east Mahantango creek watershed, Pennsylvania	Cline, George Douglas	Geology	Geology	M.S.	1968	Parizek, R.R.
Anisotropy of granites: a reflection of microscopic fabric	Douglass, Peter Mack	Geology	Geology	M.S.	1968	Voight, Barry
Structural relationships, petrography, chemistry, and magnetic properties of some dike swarms in and around the Mutton Bay pluton, Quebec	Gerencher, Joseph J.	Geology	Geology	M.S.	1968	Gold, David P.
Microprobe investigation of Portland cement hydrates	Grutzeck, Michael William.	Geochemistry	Geochemistry	M.S.	1968	Roy, Della M.
The hydrothermal behavior of basalts in their melting range at 5 kilobars	Helz, Rosalind Tuthill.	Geochemistry	Geochemistry	M.S.	1968	Burnham, C.W.
An investigation of the solubility of indium in hydrothermally synthesized galena (PbS) and sphalerite ([beta]-ZnS).	Kissin, Stephen A.	Geochemistry	Geochemistry	M.S.	1968	Wright, H.D.
Significance of laminations in the upper Silurian evaporite depost of the Michigan basin	Kunasz, Ihor Andrew	Geology	Geology	M.S.	1968	Schmalz, R.F.
Geology and mineral resources of Path valley, Franklin county, Pennsylvania	Okuma, Angelo Frederick	Geology	Geology	M.S.	1968	Scholten, Robert
A petrographic and chemical study of coal dikes intruding lamprophyre sills in the Purgatoire river valley of Colorado	Podwysocki, Melvin Henri	Geology	Geology	M.S.	1968	Dutcher, R.R.
Geology of the Blue Diamond breccia, Clark county, Nevada	Roberts, Michael Taylor	Geology	Geology	M.S.	1968	Lattman, L.H.
Petrographic investigation of three cored wells of the salt wash member of the Morrison formation, Montrose county, Colorado	Singer, Donald Allen	Mineralogy and petrology	Mineralogy and petrology	M.S.	1968	Griffiths, J.C.
Paleontology of the Columbiana shale near Corsica, Pennsylvania	Smith, Ronald D.	Geology	Geology	M.S.	1968	Guber, A.L.
Phase relations in the system Li^2O-Na^2O-Al^2O^3-SiO^2 with special emphasis on the silica polymorphs	Badger, William Barton	Geochemistry	Geochemistry	Ph.D.	1968	Hummel, F.A.
Structure and tectonics of the southern Lemhi range, Idaho	Beutner, Eward Chandler	Geology	Geology	Ph.D.	1968	Scholten, Robert
The petrology of some peats of southern Florida (with special reference to the origin of coal)	Cohen, A. D. (Arthur David)	Geology	Geology	Ph.D.	1968	Spackman Jr., William
The geohydrologic variables which control seepage from a stream crossing an alluvial fan	Cooley, Richard Lewis	Geology	Geology	Ph.D.	1968	Parizek, R.R.
Late tertiary and quaternary geomorphic history of Kyle canyon, Spring mountains, Nevada	Dolliver, Claire Vincent	Geology	Geology	Ph.D.	1968	Lattman, L.H.

The quaternary geology of the Moapa valley, Clark county, Nevada	Gardner, Leonard Robert	Geology	Geology	Ph.D.	1968	Lattman, L.H.
Petrogenesis of graywacke in a mid-paleozoic, northern Appalachian epieugeosyncline	Hanson, Henry W. A.	Geology	Geology	Ph.D.	1968	Williams, E.G.
Mississippian stratigraphy and sedimentology, across the Wasatch line, east-central Idaho and extreme southwestern Montana	Huh, Oscar Karl	Geology	Geology	Ph.D.	1968	Scholten, Robert; Williams, E.G.
Dielectric relaxation in strontium titanate-rare earth titanate solid solutions	Johnson, David Wilfred	Ceramic Science	Earth Science	Ph.D.	1968	Unknown
Phase equilibria at liquidus temperatures in the system Ca-Fe-Ti-O	Kimura, Shigeyuki	Geochemistry	Geochemistry	Ph.D.	1968	Muan, Arnulf
Zinc dispersion in the Upper Mississippi Valley zinc-lead district	Lavery, Norman Garnsey	Geology	Geology	Ph.D.	1968	Barnes, H.L.
Comparative petrology of two igneous complexes in the South Carolina Piedmont	Medlin, Jack Harold	Geology	Geology	Ph.D.	1968	Thornton, C.P.; Gold, David P.
Relationships of sedimentary bed forms, petrology, and hydraulic equivalence properties of an ancient point-bar sandstone deposit	Modarresi, Hassan G.	Geology	Geology	Ph.D.	1968	Williams, E.G.
Petrography and geochemistry of the Rensselaer Graywacke, Troy, New York	Ondrick, Charles William	Mineralogy and petrology	Mineralogy and petrology	Ph.D.	1968	Griffiths, J.C.
The hydrolysis and polymerization processes of iron (III) in aqueous solution	Ragone, Stephen Edward	Geochemistry	Geochemistry	Ph.D.	1968	Bates, T.F.; Hsu, P.H.
Solubility of copper in aqueous sulfide solutions coexisting with covellite from 25 ̊to 200C̊, with geologic applications	Romberger, Samuel B.	Geochemistry	Geochemistry	Ph.D.	1968	Barnes, H.L.
The Beaverhead formation : a late cretaceous-paleocene syntectonic deposit in southwestern Montana and east-central Idaho	Ryder, Robert Thomas	Geology	Geology	Ph.D.	1968	Scholten, Robert
Stoichiometry and phase changes in zinc sulfide	Scott, S. D. (Steven Donald)	Geochemistry	Geochemistry	Ph.D.	1968	Barnes, H.L.
Hydrolysis equilibria in the system K_2O-Al_2O_3-SiO_2-H_2O	Shade, John William	Geochemistry	Geochemistry	Ph.D.	1968	Burnham, C.W.
Sedimentary environments and environmental change in the peat-forming area of South Florida	Smith, William Gill	Geology	Geology	Ph.D.	1968	Spackman Jr., William
Phase equilibria in a portion of the system Fe-C-O from 250 to 10,000 bars and 400°C to 1200°C and its petrologic significance	Weidner, Jerry Raymond	Geochemistry	Geochemistry	Ph.D.	1968	Roy, Della M.
A measure of the energy flux represented by a seismogram	Yiu, Shih-Kao	Geophysics	Geophysics	Ph.D.	1968	Howell Jr., B.F.
Base and total stream flow variability in carbonate basins	Bauer, John W.	Geology	Geology	M.S.	1969	Parizek, R.R.
Late Cenozoic geomorphic history of Lee canyon, Spring mountains, Nevada	Gucwa, John Henry	Geology	Geology	M.S.	1969	Lattman, L.H.
Emplacement and cooling history of a rhyolite lava flow and related tuff at Deadman Pass, near Death Valley, California	Haefner, Richard Charles	Geology	Geology	M.S.	1969	Wright, H.D.; Thornton, C.P.
The origin of shale chip deposits in southeastern Centre county, Pennsylvania	Jobling, John Lloyd	Geology	Geology	M.S.	1969	Lattman, L.H.
Mountain runoff and its relation to precipitation, ground water, and recharge to the carbonate aquifers of Nittany valley, Pennsylvania	Konikow, Leonard Franklin	Geology	Geology	M.S.	1969	Parizek, R.R.

Sanitary landfill leachate interactions with a carbonate-rock derived soil in central Pennsylvania	Lane, Burke E.	Geology	Geology	M.S.	1969	Parizek, R.R.
Frequency-band and integrated magnitude using long period seismograms	Lundquist, Gary M.	Geophysics	Geophysics	M.S.	1969	Howell Jr., B.F.
Reconnaissance gravity surveying for drift-filled valleys in the Mercer quadrangle, Pennsylvania	Rankin, William E.	Geophysics	Geophysics	M.S.	1969	Lavin, P.M.
The origin and development of case-hardening in the northeastern Spring mountains, Clark county, Nevada	Simonberg, Elliot Mark	Geology	Geology	M.S.	1969	Lattman, L.H.
The study of the system $NaAlSiO^4$-Mg^2SiO^4-SiO^2\H^2O from 200 to 5,000 bars and 800C̊ to 1100C̊ and its petrologic applications	Carman, John Homer	Mineralogy and petrology	Mineralogy and petrology	Ph.D.	1969	Roy, Della M.; Tuttle, O.F.
Dislocation structures and the mechanical properties of mica	Caslavsky, Jaroslav Ladislav	Geochemistry	Geochemistry	Ph.D.	1969	Vedam, Kuppuswami
The ion-product constant of water to 350C	Fisher, James R. (James Russell)	Geochemistry	Geochemistry	Ph.D.	1969	Barnes, H.L.
Tectonics of the Badwater uplift area, central Wyoming	Gard, Theodore Max	Geology	Geology	Ph.D.	1969	Scholten, Robert
The elastic coefficients of forsterite as a function of pressure and temperature	Graham, Earl K.	Geophysics	Geophysics	Ph.D.	1969	Barsch, G.R.; Alexander, S.S.
Trace element studies in synthetic sulfide systems : the solubility of thallium in sphalerite and the partition of selenium between sphalerite and galena	Halbig, Joseph B.	Geochemistry	Geochemistry	Ph.D.	1969	Wright, H.D.
Experimental metamorphism and anatexis of shales and graywackes	Kilinc, Ishtak Atilla	Geology	Geology	Ph.D.	1969	Burnham, C.W.
Studies of the divalent rare earth oxides	McCarthy, Gregory Joseph	Solid State Science	Earth Science	Ph.D.	1969	Unknown
Spectroscopic properties of the natural silicate garnets	Moore, Raymond Kenworthy	Geochemistry	Geochemistry	Ph.D.	1969	White, W.B.
Hydrogeologic factors influencing well yields and auquifer hydraulic properties of folded and faulted carbonate rocks in central Pennsylvania	Siddiqui, Shamsul Hasan	Geology	Geology	Ph.D.	1969	Parizek, R.R.
Characterization and application of cathodoluminescence from manganese activated carbonate minerals	Sommer, Sheldon E.	Geochemistry	Geochemistry	Ph.D.	1969	Keith, M.L.; White, E.W.
Carbon and oxygen isotope studies of the great Estuarine series (Jurassic) of Scotland	Tan, Francis C.	Geochemistry	Geochemistry	Ph.D.	1969	Keith, M.L.
Adsorption of purines, pyrimidines and nucleosides on montmorillonites and illites	Thompson, Thomas Dick	Geochemistry	Geochemistry	Ph.D.	1969	Brindley, G.W.
Effect of High Pressure on Crystalline Solubility in the System NaCl-KCl	Bhardwag, Mahesh C.	Unknown	Unknown	M.S.	1970	Unknown
Genesis and geologic relations of the high-alumina Mercer fireclay, western Pennsylvania	Bragonier, William Atwood	Geology	Geology	M.S.	1970	Williams, E.G.
Skeletal morphology, variability, and ecology of the bryozoan species "Crisia eburnea" in the modern reefs of Bermuda	Foerster, Bernhard	Geology	Geology	M.S.	1970	Cuffey, R.J.

The influence of geologic and geomorphic parameters on the flood response of small drainage basins in Pennsylvania	Garihan, Anne Burroughs Lutz	Geology	Geology	M.S.	1970	Lattman, L.H.
Acquiring and following earth objects optically from an earth-orbiting vehicle	Hilbert, Richard Madden	Engineering Science	Earth Science	M.S.	1970	James G. Jewell
Symmetry Improvement of the Magnetic Anomalies and Spreading-Rate Ratio Determination for Mid-Oceanic Ridges	Michlik, Rudolph R.	Unknown	Unknown	M.S.	1970	Unknown
Elastic and viscoelastic behavior of two sedimentary rocks	Mundi, Emmanuel Kengnjisu	Geology	Geology	M.S.	1970	Voight, Barry
Propulsion requirements imposed by the synchronous equatorial orbit on a spin-stabilized earth satellite system	Rich, C. C.	Engineering Science	Earth Science	M.S.	1970	Unknown
Seasonal variations in carbonate spring water chemistry related to ground water flow	Shuster, Evan Thomas	Geology	Geology	M.S.	1970	White, W.B.
The freeze-thaw resistance of some Pennsylvania gravel aggregates	Stewart, Nanna Beth Bolling	Geology	Geology	M.S.	1970	Wright, L.A.; Cady, P.D.
Hetero-epitaxial growth of large crystals of a metastable phase: germania [Quartz]	Theokritoff, Sergius	Geochemistry	Geochemistry	M.S.	1970	Roy, Rustum
An X-ray powder diffraction study of potassium feldspar froM.S.ix possible meteorite impact sites	Aitken, Francis Kenneth	Mineralogy and petrology	Mineralogy and petrology	Ph.D.	1970	Wickman, F.E.; Gold, D.P.
An X-ray powder diffraction study of potassium feldspar from six possible meteorite impact sites	Aitken, Francis Kenneth	Mineralogy and petrology	Mineralogy and petrology	Ph.D.	1970	Wickman, F.E.; Gold, D.P.
Stratigraphy, petrography, and origin of tertiary sediments off the front of the Beartooth Mountains, Montana-Wyoming	Flueckinger, Linda Ann	Geology	Geology	Ph.D.	1970	Dutcher, R.R.
Phase relations and compositions in the basalt-CO^2-H^2O system at hgh temperatures and pressures	Holloway, John Requa	Geochemistry	Geochemistry	Ph.D.	1970	Burnham, C.W.
Analysis of uranium and thorium and their daughter nuclides in uranium-thorium ores by high-resolution gamma-ray spectrometry	Khattab, Khattab Mansour M.	Geochemistry	Geochemistry	Ph.D.	1970	Griffiths, J.C.; Keith, L.C.
Geology and geochemistry of the lithium deposit in Clayton Valley, Esmeralda County, Nevada	Kunasz, Ihor Andrew	Geology	Geology	Ph.D.	1970	Schmalz, R.F.; Wright, L.A.
Potential field development froM.S.teady-state current flow with buried sources in an inhomogenous half-space	Merkel, Richard H.	Geophysics	Geophysics	Ph.D.	1970	Alexander, Shelton S.
Potential field development from steady-state current flow with buried sources in an inhomogenous half-space	Merkel, Richard H.	Geophysics	Geophysics	Ph.D.	1970	Alexander, Shelton S.
Melting and phase relations in nepheline syenites with H^2O and H^2O+CO^2	Millhollen, Gary Lloyd	Geochemistry	Geochemistry	Ph.D.	1970	Burnham, C.W.
The Rhabdomesidae of the Wreford megacyclothem (Wolfcampian, Permian) of Nebraska, Kansas, and Oklahoma	Newton, Geoffrey Bruce	Geology	Geology	Ph.D.	1970	Dutcher, R.R.; Cuffey, R.J.
Palynology in relation to depositional environments of lignite in the Wilcox group (early Tertiary) in Texas	Nicholas, Douglas James	Geology	Geology	Ph.D.	1970	Traverse, A.F.

Aquifer transmissivity distribution as reflected by overlying soil temperature patterns	O'Brien, Philip John	Geology	Geology	Ph.D.	1970	Parizek, R.R.
Ground Water Pollution Potential of a Sanitary Landfill Above the Water Table	Apgar, Michael A.	Unknown	Unknown	M.S.	1971	Unknown
A study of the faunal succession in the Brush Creek shale (Pennsylvanian) near Shelocta, Pennsylvania	Brant, Lynn Alvin	Geology	Geology	M.S.	1971	Guber, A.L.
Shallow ground-water flow systems beneath strip and deep coal mines at two sites, Clearfield County, Pennsylvania	Brown, Robert Lewis	Geology	Geology	M.S.	1971	Parizek, R.R.
The geology and water resources of the Bellefonte-Mingoville area, Pennsylvania	Meiser, Edgar William	Geology	Geology	M.S.	1971	Parizek, R.R.
Effect of grain size, "regolith" thickness, gas pressure, and duration of gas streaming on the morphology of fluidization craters	Siegal, Barry S.	Geology	Geology	M.S.	1971	Gold, David P.
Quartzite genesis in the Upper Johnnie Formation	Siegel, Donald I.	Geology	Geology	M.S.	1971	Unknown
An occurrence of large scale, inactive, sorted patterned ground south of the glacial border in central Pennsylvania	Troutt, William Richard	Geology	Geology	M.S.	1971	Lattman, L.H.
The mechanism of emplacement of the Marble mountain (White Horse Hills) laccolith	Verbeek, Karen Jane Wenrich	Geology	Geology	M.S.	1971	Thornton, C.P.; Gold, David P.
Geology of the Nazareth quadrangle, Northampton County, Pennsylvania	Aaron, John Marshall	Geology	Geology	Ph.D.	1971	Scholten, Robert
Geomorphic evolution of anticlinal vallies in central Pennsylvania	Ciciarelli, John Anthony	Geology	Geology	Ph.D.	1971	Lattman, L.H.
Hydrothermal solubility of magnetite	Helz, George Rudolph	Geochemistry	Geochemistry	Ph.D.	1971	Barnes, H.L.
An Analysis of factors controlling deviations in hydraulic equivalence in some modern sands.	Lowright, Richard Henry	Geology	Geology	Ph.D.	1971	Williams, E.G.
Structure of the southwestern Ruby Range near Dillon, Montana.	Okuma, Angelo Frederick	Geology	Geology	Ph.D.	1971	Scholten, Robert; Wright, L.A.
Multivariate statistical analysis of the unit regional value of mineral resources	Singer, Donald Allen	Mineralogy and petrology	Mineralogy and petrology	Ph.D.	1971	Griffiths, J.C.
The pressurization and failure of model underground openings	Siskind, David Eugene	Geophysics	Geophysics	Ph.D.	1971	Alexander, Shelton S.; Hardy, H.R.
An investigation of earthquake risk in the Puget Sound area by use of the type I distribution of largest extremes	Stepp, Jesse Carl	Geophysics	Geophysics	Ph.D.	1971	Howell Jr., B.F.
Carbonate bottoM.S.ediments of the Arabian Gulf in relation to environmental parameters	Al-Temeeni, Ali Yousuf	Geology	Geology	M.S.	1972	Weber, J.N.
Carbonate bottom sediments of the Arabian Gulf in relation to environmental parameters	Al-Temeeni, Ali Yousuf	Geology	Geology	M.S.	1972	Weber, J.N.
Photogeomorphic Analysis of Northern Basin Trinidad	Alvarado, Rodrigo B.	Unknown	Unknown	M.S.	1972	Unknown
Regional Metamorphism of Pelites in Southeastern Pennsylvania	Bender, John F.	Geochemistry.	Geochemistry.	M.S.	1972	Unknown

A rapid orbit generation algorithm for a near earth satellite including effects of oblateness and aerodynamic drag	Branyan, Elmer R.	Engineering Science	Earth Science	M.S.	1972	S.E. Moskowitz
A parametric analysis relating launch time, recovery time, mission duration, and arbitrary recovery sites for near earth orbiting vehicles	Bucsek, Gerald F.	Engineering Science	Earth Science	M.S.	1972	Richard E. Llorens
Fortran IV Program for Calculating X-Ray Powder Diffraction Patterns - Version 5	Clark, Connie M.	Geosciences	Geosciences	M.S.	1972	Unknown
Geochemical behavior of platinum, palladium, and associated elements in the weathering cycle in the Stillwater complex, Montana	Fuchs, William Arthur	Geochemistry	Geochemistry	M.S.	1972	Rose, A.W.
Study of seismic methods in the detection of subsurface fracture zones	Hawk, Joseph H.	Geophysics	Geophysics	M.S.	1972	Unknown
Neutron Activation Analysis of Alkali Metals in Pegmatitic Quartz and Its Fluid Inclusions	Horn, Richard A.	Unknown	Unknown	M.S.	1972	Unknown
The Relationship Between Bedforms Occurrence Composition Texture and Physical Properties of the Upper Devonian Flagstones in Northeastern Pennsylvania	Krajewski, Stephen A.	Unknown	Unknown	M.S.	1972	Unknown
An olivine tholeiite dike swarm in Lancaster County, Pennsylvania	Lanning, Robert Mayo	Geology	Geology	M.S.	1972	Rose, A.W.
An analysis of the factors controlling the occurrence of bloating shales in the Pennsylvanian system of western Pennsylvania	Lithgow, Enrique W.	Geology	Geology	M.S.	1972	Williams, Eugene G.
Palynology of the Dakota Sandstone (Middle Cretaceous) near Bryce Canyon National Park, southern Utah	May, Fred E.	Geology	Geology	M.S.	1972	Unknown
The Northeast Breccia Dike : a petrologic study of a diatreme fissure from the Oka area, Quebec	Moore, Joseph N.	Geology	Geology	M.S.	1972	Gold, David P.
Earth science field trip guidebook for Chester County	Platco, Nicholas L.	Earth Science	Earth Science	M.S.	1972	Unknown
Vibrational spectra of selected melilite minerals	Scheetz, Barry Earl	Geochemistry	Geochemistry	M.S.	1972	White, W.B.
Prediction of the frequency domain response of explosive sources with comparison to the BOXCAR event	Shore, Michael J.	Geophysics	Geophysics	M.S.	1972	Unknown
Phase equilibriuM.S.tudies in the system $NaAlSiO^4$-$CaMgSi^2O^6$-SiO^2-iron oxide at variable oxygen fugacities, and some petrologic implications	Voultsos, Mark	Geochemistry	Geochemistry	M.S.	1972	Osborn, E.F.
Phase equilibrium studies in the system $NaAlSiO^4$-$CaMgSi^2O^6$-SiO^2-iron oxide at variable oxygen fugacities, and some petrologic implications	Voultsos, Mark	Geochemistry	Geochemistry	M.S.	1972	Osborn, E.F.
A palynological study of shales and "coals" of a Devonian-Mississippian transition zone, central Pennsylvania	Warg, Jamison B.	Geology	Geology	M.S.	1972	Traverse, Alfred
Fistuliporoid bryozoans of the Wreford megacyclothem (Lower Permian) in Kansas	Warner, David J.	Geology	Geology	M.S.	1972	Cuffey, Roger J.
A multivariate chemical classification of rocks from the Monteregian Petrographic Province Quebec, Canada	Block, Fred	Geochemistry	Geochemistry	Ph.D.	1972	Griffiths, J.C.; Gold, D.P.
Experimental studies in the system $NaAlSi^3O^8H^2O$; part I: the apparent solubility of albite in supercritical water; part II: the partial specific volume of H^2O in $NaAlSi^3O^8$ melts with petrologic implications	Davis, Nicholas Falconer	Geochemistry	Geochemistry	Ph.D.	1972	Burnham, C.W.

The palynology of the triassic Dockum group of Texas, and its application to stratigraphic problems of the Dockum group	Dunay, Robert Edmund	Geology	Geology	Ph.D.	1972	Traverse, A.F.
The elastic coefficients of bronzite as a function of pressure and temperature	Frisillo, Albert Lawrence	Geophysics	Geophysics	Ph.D.	1972	Barsch, G.R.; Alexander, S.S.
Pressure-temperature studies of the alumina-water and the aluminum-water systems	Gigl, Paul Donald	Geochemistry	Geochemistry	Ph.D.	1972	Dachille, Frank
The origin, sedimentation, and stratigraphy of a calcitic mud located in the southern freshwater Everglades	Gleason, Patrick James	Geology	Geology	Ph.D.	1972	Spackman Jr., William
Igneous history of a rhyolite lava-flow series near Death Valley, California	Haefner, Richard Charles	Geology	Geology	Ph.D.	1972	Wright, L.A.; Thornton, C.P.,; Griffiths, J.C.
The hydrous magnesium nickel silicates -- the garnierites	Hang, Pham Thi	Geochemistry	Geochemistry	Ph.D.	1972	Brindley, G.W.
Zoned hydrothermal alteration and ore deposits in sedimentary rocks near mineralized intrusions, Ely area, Nevada	James, Laurence Pierson	Geology	Geology	Ph.D.	1972	Rose, A.W.
Structural setting of the Orhaneli ultramafic massif near Bursa, northwestern Turkey	Lisenbee, Alvis Lee	Geology	Geology	Ph.D.	1972	Scholten, Robert
Phase equilibria and crystal chemistry in the systeM.S.iO^2-NiO-NiA1^{2}O^4	Ma, Che-Bao	Geology	Geology	Ph.D.	1972	Unknown
Phase equilibria and crystal chemistry in the system SiO^2-NiO-NiA1^{2}O^4	Ma, Che-Bao	Geology	Geology	Ph.D.	1972	Unknown
The chemistry, mineralogy, and petrography of the Pine Valley Mountains, southwestern Utah	Mattison, George David	Mineralogy and petrology	Mineralogy and petrology	Ph.D.	1972	Thornton, C.P.
The phase relationships of phlogopite in the system K^{2}O-MgO-CaO-Al^{2}O^3-SiO^2-H^{2}O to 35 kilobars pressure : a model for the stability of mica in the upper mantle of the earth	Modreski, Peter John	Geochemistry	Geochemistry	Ph.D.	1972	Buettcher, A.L.
The Physical Characteristics of some fractured aquifers in central Pennsylvania and a digital simulation of their sustained yeilds.	Mundi, Emmanuel Kengnjisu	Geology	Geology	Ph.D.	1972	Parizek, R.R.
The form, structure, and evolution of the Allegheny Front in Centre County, Pennsylvania.	O'Leary, Dennis William	Geology	Geology	Ph.D.	1972	Lattman, L.H.; Gold, D.P.
The effects of lithology and other hydrogeologic factors on the development of solution porosity in the middle Ordovician carbonates of central Pennsylvania	Rauch, Henry William	Geochemistry	Geochemistry	Ph.D.	1972	White, W.B.
Finite element analyses of initial elastic deformation of vertically deformed crustal blocks	Samuelson, Alan Conrad	Geology	Geology	Ph.D.	1972	Voight, Barry
Remote determinations of earth structure from relative event analysis with applications to the mid-Atlantic ridge	Taylor, Robert Warren	Geophysics	Geophysics	Ph.D.	1972	Alexander, Shelton S.
A study of the Charlevoix structure, Quebec, Canada	Walawender, Michael John	Mineralogy and petrology	Mineralogy and petrology	Ph.D.	1972	Gold, David P.; Smith, D.K.
Revision of the genus Bollia (Ostracoda)	Aivano, John Peter	Geology	Geology	M.S.	1973	Guber, A.L.
Spectral analysis of the gravity effect due to finite mass distributions	Carroll, Richard	Geophysics	Geophysics	M.S.	1973	Unknown

Gold mineralization in the Sunnyside Mine, Eureka Mining District, San Juan County, Colorado	Casadevall, Tom	Geology	Geology	M.S.	1973	Unknown
Wavenumber Domain Analysis of Aeromagnetic Data	Chewning, John R.	Unknown	Unknown	M.S.	1973	Unknown
The history of mass movement processes in the Redwood Creek Basin, Humboldt County, California	Colman, Steven M.	Geology	Geology	M.S.	1973	Unknown
Temperature patterns in soil above caves and fractures in bedrock	Ebaugh, Walter F.	Geology	Geology	M.S.	1973	Unknown
Magnetic studies on soda-lime silicate glasses containing iron equilibrated at various oxygen partial pressures	Fisher, Wilson	Geochemistry	Geochemistry	M.S.	1973	Mulay, L.N.
Adsorption and oxidation of aromatic amines on clay minerals	Furukawa, Toshiharu	Geochemistry	Geochemistry	M.S.	1973	Brindley, G.W.
The petrology and coking behavior of certain western Canadian coals and their significance in predicting coke strength	Goscinski, John S.	Geosciences	Geosciences	M.S.	1973	Unknown
Chemical and Carbon Isotopic Evolution of Carbonate Waters in the Nittany Valley of Central Pennsylvania	Harmon, Russell S.	Unknown	Unknown	M.S.	1973	Unknown
A geologic survey of Allegheny County, Pennsylvania	Hart, Margaret Lynn	Earth Science	Earth Science	M.S.	1973	Unknown
Melting relations in the system alkali basalt-H^2O from 10 to 30 Kbars	Haygood, Christine Cricket	Geochemistry	Geochemistry	M.S.	1973	Boettcher, A.L.
Environmental geology in York and the surrounding region	Horne, Mary Elizabeth	Geology	Geology	M.S.	1973	Unknown
Geochemical exploration in the Nittany Valley area, Centre County, Pennsylvania	Hsu, Fu-Tzu	Geochemistry	Geochemistry	M.S.	1973	Rose, A.W.
Quality changes in water beneath a streambed in a carbonate terrane, central Pennsylvania	Krothe, Noel Calvin	Geology	Geology	M.S.	1973	Parizek, R.R.
The high temperature crystal structure of Ag^2S-II	Lowenhaupt, Douglas E.	Geochemistry and Mineralogy	Geochemistry and Mineralogy	M.S.	1973	Unknown
Chromium and nickel in soil as geochemical indicators for chromite deposits in the State Line district, Pennsylvania	Pennington, Dennis	Geochemistry	Geochemistry	M.S.	1973	Unknown
Determination of optimuM.S.ample size for paleoecological investigations of the basal part of the Choptank formation (Miocene), Maryland	Shapiro, Earl A.	Geology	Geology	M.S.	1973	Guber, A.L.
Determination of optimum sample size for paleoecological investigations of the basal part of the Choptank formation (Miocene), Maryland	Shapiro, Earl A.	Geology	Geology	M.S.	1973	Guber, A.L.
Transportation and hydraulic equivalence relationships of light and heavy minerals in sands	Slingerland, Rudy	Geology	Geology	M.S.	1973	Williams, Eugene G.
Electron petrography of bent augite crystals from the Triassic traps of the Mid-Atlantic states	Tamm, Lucille C.	Geochemistry and Mineralogy	Geochemistry and Mineralogy	M.S.	1973	Unknown
The geochemistry of some precambrian ultramafic rocks	Villaume, James Frank	Geosciences	Geochemistry	M.S.	1973	N. H. Suhr
Petrology of the Bear Creek lamprophyre dike in the Spanish Peaks igneous complex, Colorado	Crelling, John Crawford	Geology	Geology	Ph.D.	1973	Gold, David P.; Thornton, C.P.
Stratigraphy and brachiopod genus "Composita" of the Wreford megacyclothem (lower Permian) in Kansas and Oklahoma	Garihan, Anne Burroughs Lutz	Geology	Geology	Ph.D.	1973	Cuffey, R.J.

Geology and talc deposits of the central Ruby Range, Madison County, Montana	Garihan, John Michael	Geology	Geology	Ph.D.	1973	Scholten, Robert
The role of nickel in geochemically important oxide phases, as deduced from phase equilibria at liquidus temperatures in the system MgO-NiO-iron oxide-SiO^2	Grutzeck, Michael William	Geochemistry	Geochemistry	Ph.D.	1973	Maun, Arnulf
An isotopic study of the magnetite-chalcopyrite deposit at Cornwall, Pennsylvania	Herrick, David C.	Geochemistry	Geochemistry	Ph.D.	1973	Rose, A.W.; Deines, Peter
Geologic and mineralogic factors controlling the properties and occurrence of ladle brick clays	Holbrook, Philip W. (Philip William)	Geology	Geology	Ph.D.	1973	Williams, E.G.
Controls on the quality of some carbonate ground waters: dissociation constants of calcite and $CaHCO+^3$ from 0 to 50 Ċ	Jacobson, Roger Leif	Geochemistry	Geochemistry	Ph.D.	1973	Langmuir, Donald
Progressive failure in discontinuous rock masses subjected to shear deformation	Kasapoglu, Kadri Ercin	Geology	Geology	Ph.D.	1973	Voight, Barry
Simulation of hydrologic and chemical-quality variations in an irrigated stream-aquifer system, Arkansas River Valley, Colorado	Konikow, Leonard Franklin	Geology	Geology	Ph.D.	1973	Parizek, R.R.
Creep response of the lunar crust in mare regions from an analysis of crater deformation	Kunze, Adolf Wilhelm Gerhard	Geophysics	Geophysics	Ph.D.	1973	Alexander, Shelton S.; Lavin, P.M.
An investigation of Rayleigh wave ellipticity with applications to earth structure	Newton, Carl Adam	Geophysics	Geophysics	Ph.D.	1973	Alexander, Shelton S.
The systematics of polymorphism in binary sulfides. I. Phase equilibria in the system mercury-sulfur. II. Polymorphism in binary sulfides	Potter, Robert William	Geochemistry	Geochemistry	Ph.D.	1973	Barnes, H.L.
Phase relations among pyrite, marcasite, and pyrrhotite below 300 Ċ	Rising, Brandt Albert	Geochemistry	Geochemistry	Ph.D.	1973	Barnes, H.L.
Crater morphology: an indicator of origin?	Siegal, Barry S.	Geology	Geology	Ph.D.	1973	Gold, David P.
Geochemistry of Triassic diabase froM.S.outheastern Pennsylvania	Smith, Robert Charles	Geochemistry	Geochemistry	Ph.D.	1973	Rose, A.W.
Geochemistry of Triassic diabase from southeastern Pennsylvania	Smith, Robert Charles	Geochemistry	Geochemistry	Ph.D.	1973	Rose, A.W.
Crustal and upper mantle P-wave velocity heterogeneity and the problem of earthquake location	Spence, William John	Geophysics	Geophysics	Ph.D.	1973	Alexander, Shelton S.
Petrofabric analysis of the Glarner Freiberg, Kanton Glarus, Switzerland	Werner, Matthew Lambert	Geology	Geology	Ph.D.	1973	Harris, D.P.
The chemistry and mineralogy of ferric oxyhydroxides precipitated in sulfate solutions	Whittemore, Donald Osgood	Geochemistry	Geochemistry	Ph.D.	1973	Langmuir, Donald
The geology of Snyder County Pennsylvania	Bechtel, William L.	Earth Science	Earth Science	M.S.	1974	Unknown
Skeletal morphology, variability, and ecology of the Bryozoan species Idmonea atlantica in the modern reefs of Bermuda	Berger, Roger J.	Geology	Geology	M.S.	1974	Unknown
Ostracode paleoecology froM.S.hales of the Wreford Megacyclothem (Lower Permian), Kansas and Oklahoma	Bifano, Francis V.	Geology	Geology	M.S.	1974	Guber, Albert
Ostracode paleoecology from shales of the Wreford Megacyclothem (Lower Permian), Kansas and Oklahoma	Bifano, Francis V.	Geology	Geology	M.S.	1974	Unknown

Environmental geology for planning in the Branford Quadrangle, Connecticut	Brown, Charles E.	Geology	Geology	M.S.	1974	Parizek, Richard
An X-ray study of heat-treated chlorites	Chang, Tien-show	Mineralogy and petrology	Mineralogy and petrology	M.S.	1974	Brindley, G.W.
The use of the gravity surveying technique in studying soil thickness and bedrock topography	Galiette, Stephen J.	Geophysics	Geophysics	M.S.	1974	Unknown
Controls on Heavy Metals in Surface and Ground Waters Affected by Coal Mine Drainage: Clarion River-Redbank Creek Watershed Pennsylvania	Gang, Michael W.	Unknown	Unknown	M.S.	1974	Unknown
The geochemistry of cadmium	Gong, Henry	Geochemistry	Geochemistry	M.S.	1974	Suhr, M.H.; Rose, A.W.
Application of the finite element method to potential field problems	Houck, Richard Thomas	Geophysics	Geophysics	M.S.	1974	Unknown
A gravimetric and magnetic survey of perlite domes at No Agua, New Mexico	Kowatch, John S.	Geophysics	Geophysics	M.S.	1974	Unknown
Sedimentology of Upper Chemung and Catskill sediments along the Appalachian front in Central Pennsylvania	Menzie, W. D.	Geology	Geology	M.S.	1974	Unknown
Sources and natural removal processes for some gaseous atmospheric pollutants	Rasmussen, Karen Hansine	Geochemistry	Geochemistry	M.S.	1974	Wickman, F.E.
A gravity and magnetic survey of the martic region in the vicinity of Mine Ridge	Scanlin, Michael A.	Geophysics	Geophysics	M.S.	1974	Unknown
Linear regression analysis of modified mercalli intensity variations with distance for three seismic regions of the United States and Eastern Canada	Schultz, Thomas R.	Geophysics	Geophysics	M.S.	1974	Unknown
The solubility of quartz in supercritical $H^2$0-CO^2 fluids	Shettel, Don Landis	Geochemistry	Geochemistry	M.S.	1974	Burnham, C. W.
Preliminary paleomagnetic results for a Rossville-type diabase dike system in southeastern Pennsylvania	Volk, Karen W.	Geophysics	Geophysics	M.S.	1974	Unknown
CoO-A1$^2O^3$-TiO^2 as a model for equilibria involving phases of pseudobrookite, ilmenite and spinel structures	Welch, Jane M.	Geochemistry	Geochemistry	M.S.	1974	Unknown
Trace element and sulfur isotopic comparison of anhydrites from Balmat-Edwards, N.Y., with sedimentary and hydrothermal anhydrite	Whelan, Joseph F.	Geochemistry	Geochemistry	M.S.	1974	Unknown
Solvation and deposition of chalcopyrite and chalcocite assemblages in hydrothermal solutions	Crerar, David Alexander	Geochemistry	Geochemistry	Ph.D.	1974	Barnes, H.L.
Theory and practice of geophysical survey design	Davis, Thomas Mooney	Geophysics	Geophysics	Ph.D.	1974	Lavin, P.M.
Hydrologic budget of Spring Creek drainage basin, Pennsylvania	Giddings, Marston Todd	Geology	Geology	Ph.D.	1974	Parizek, R.R.
Hydrochemical investigations of the central Kentucky karst aquifer system	Hess, J. W. (John Warren)	Geology	Geology	Ph.D.	1974	White, W.B.
Studies on chemiluminescence in diffusion flames of alkali and alkaline earth metal vapors	Hsu, Chung-jen	Fuel Science	Earth Science	Ph.D.	1974	Palmer, Howard B.
Stratigraphy, petrography, and structure of the Laramide (Paleocene) sediments marginal to the Beartooth Mountains, Montana	Jobling, John Lloyd	Geology	Geology	Ph.D.	1974	Dutcher, R.R.
The glacial geology and hydrology of Day County, South Dakota	Leap, Darrell Ivan	Geology	Geology	Ph.D.	1974	Parizek, R.R.

Melting of a hydrous mantle: phase relations of natural peridotite to 30 kilobars and 1250 Ċ with controlled activities of water, carbon dioxide, and oxygen	Mysen, Bjørn Olav	Geochemistry	Geochemistry	Ph.D.	1974	Boettcher, A.L.
Geology, extrusion history, and analysis of characteristics of perlites from No Agua, New Mexico	Naert, Karl Achiel	Geology	Geology	Ph.D.	1974	Wright, L.A.; Griffiths, J.C.
The relationships of fracture traces to geologic parameters in flat-lying sedimentary rocks: a statistical analysis	Podwysocki, Melvin Henri	Geology	Geology	Ph.D.	1974	Gold, David P.; Griffiths, J.C.
Thermodynamic properties of some sulfate, carbonate, and bicarbonate ion pairs	Reardon, Eric John	Geochemistry	Geochemistry	Ph.D.	1974	Langmuir, Donald
The stratigraphy and depositional environments of the lower part of the Crystal Spring Formation, Death Valley, California	Roberts, Michael Taylor	Geology	Geology	Ph.D.	1974	Wright, L.A.; Williams, E.G.
The crystal chemistry of the uranyl silicate minerals	Stohl, Frances Virginia	Mineralogy and petrology	Mineralogy and petrology	Ph.D.	1974	Smith, D.K.
Numerical solutions of the response of a two-dimensional earth to an oscillating magnetic dipole source with application to a groundwater field study	Stoyer, Charles Hayes	Geophysics	Geophysics	Ph.D.	1974	Alexander, Shelton S.
Heavy metals in waters and soil associated with several Pennsylvania landfills	Suarez, Donald Louis	Geochemistry	Geochemistry	Ph.D.	1974	Langmuir, Donald
Coral growth rate: variation with depth	Baker, Paul A.	Geology	Geology	M.S.	1975	Unknown
An investigation of the structure in the South Atlantic ocean west of the mid-Atlantic ridge of Rayleigh wave dispersion	Bolt, Charles T.	Geophysics	Geophysics	M.S.	1975	Unknown
Determination of Trace Amounts of Lead in Geological Materials	Crock, James G.	Geochemistry.	Geochemistry.	M.S.	1975	Unknown
The geology and water resources, for land-use planning, of Potter Township, Centre County, Pennsylvania	Eby, James Robert	Geology	Geology	M.S.	1975	Unknown
Automatic computation of the minimuM.S.afety factor of an earth slope	Guthrie, James S.	Engineering Science	Earth Science	M.S.	1975	Francis P. Callahan
Automatic computation of the minimum safety factor of an earth slope	Guthrie, James S.	Engineering Science	Earth Science	M.S.	1975	Francis P. Callahan
The relationship between geology and man and how they have affected Wyoming Valley	Guzofsky, David Paul	Earth Science	Earth Science	M.S.	1975	Unknown
Gravity prediction by pseudo-density profiling	Hill, Donald W.	Geophysics	Geophysics	M.S.	1975	Unknown
The elastic properties of almandine-spessartite	Isaak, Donald G.	Geophysics	Geophysics	M.S.	1975	Unknown
In situ determination of physical properties of residual soils and underlying dolomitic bedrock using seismic techniques	Justice, Mahlon G., Jr.	Geophysics	Geophysics	M.S.	1975	Unknown
Horizontal refraction of normal modes in shallow water	Justice, Pamela R.	Geophysics	Geophysics	M.S.	1975	Unknown
The design of a high-speed low operating-energy electro-magnetic actuator using a rare-earth permanent magnet	Kotos, Peter	Engineering Science	Earth Science	M.S.	1975	Stein, Jack
Use of Landset-1 Imagery in the Analysis of Lineaments in Penna	Kowalik, WilliaM.S.tephen	Geology	Geology	M.S.	1975	Unknown

An Investigation of stream infiltration in the carbonate Nittany Valley of south central Pennsylvania	Moorshead, Frank	Geology	Geology	M.S.	1975	Unknown
A preliminary study of the importance of hydrothermal reactions on the temperature history of a hot, dry rock geothermal reservoir	Morris, James R.	Geophysics	Geophysics	M.S.	1975	Unknown
An error analysis of depth determination for finely and coarsely sampled aeromagnetic data using the technique of Werner deconvolution	Negri, Daniel R.	Geophysics	Geophysics	M.S.	1975	Unknown
Interpretation of a gravity profile across the Gettsburg Triassic basin	Shaub, F. Jeanne	Geophysics	Geophysics	M.S.	1975	Unknown
Equilibria in the system Fe-Cr-Ti-O, with special emphasis on spinel, ilmenite, and pseudobrookite phases at 1300 Ċ and 1200 Ċ and an oxygen pressure of 10 10 atmosphere	Shuart, Susan	Geochemistry and Mineralogy	Geochemistry and Mineralogy	M.S.	1975	Unknown
Hydrocarbon exploration in the North Sea and adjacent basins	Smith, Cameron	Geology	Geology	M.S.	1975	Unknown
Crystal clots in calc-alkaline andesites as breakdown products of high-A1 amphiboles	Stewart, Dion C.	Mineralogy and petrology	Mineralogy and petrology	M.S.	1975	Unknown
Short-term (twelve year) seismicity as a predictor of long-terM.S.eismic activity	Sundheimer, Glenn Robert	Geophysics	Geophysics	M.S.	1975	Unknown
Short-term (twelve year) seismicity as a predictor of long-term seismic activity	Sundheimer, Glenn Rober	Geophysics	Geophysics	M.S.	1975	Unknown
Application of a long baseline bistatic acoustic sounder to the study of temperature inversions near the earth's surface	Teufel, Michael R.	Geophysics	Geophysics	M.S.	1975	Unknown
The lizardite-nepouite and the kerolite-pimelite series of minerals	Wan, Hsien-Ming	Mineralogy and petrology	Mineralogy and petrology	M.S.	1975	Brindley, G.W.
Pleistocene geology and history of the West Branch of Susquehanna River Valley near Williamsport, Pennsylvania	Bucek, Milena F.	Geology	Geology	Ph.D.	1975	Parizek, R.R.
Filiramoporina kretaphilia : a new genus and species of Bifoliate tubulobryozoan (Ectoprocta) from the Lower Permian Wreford Megacyclothem of Kansas	Fry, Harold Chester	Earth Science	Earth Science	Ph.D.	1975	Cuffey, R.J.
Characteristics and mechanics of formation of glacial arcuate abrasion cracks	Johnson, C. Branning	Geology	Geology	Ph.D.	1975	Voight, Barry; Graham, E.K.
The origin of potassic ultramafic rocks in the Enoree "vermiculite" district, South Carolina	Libby, Stephen Charles	Geology	Geology	Ph.D.	1975	Wright, L.A.; Boettcher, A.L.
Equilibrium relations among iron-titanium oxides in silicate melts : the system $Ca\ Al^{2}\ Si^{2}\ O^{8}$ - $Ca\ Mg\ Si^{2}\ O^{6}$ - Fe O - $Ti\ O^{2}$ in contact with metallic iron	Lipin, Bruce Reed	Mineralogy and petrology	Mineralogy and petrology	Ph.D.	1975	Maun, Arnulf
Dynamic finite element analysis with applications to seismological problems	McCowan, Douglas William	Geophysics	Geophysics	Ph.D.	1975	Alexander, S.S.; Greenfield, R.J.
Abundance and occurance of mercury and other trace metals in rocks, soils, and streaM.S.ediments in Pennsylvania	McNeal, James Marr	Geochemistry	Geochemistry	Ph.D.	1975	Rose, A.W.
Abundance and occurance of mercury and other trace metals in rocks, soils, and stream sediments in Pennsylvania	McNeal, James Marr	Geochemistry	Geochemistry	Ph.D.	1975	Rose, A.W.

Ground-water geology and a digital simulation of sustained yield potential of the Altoona area, Pennsylvania	Meiser, Edgar William	Geology	Geology	Ph.D.	1975	Parizek, R.R.
Crack distribution under uniaxial load and associated changes in seismic velocities prior to failure	Rothman, Robert L.	Geophysics	Geophysics	Ph.D.	1975	Greenfield, R.J.
The Quaternary geomorphology of the lower Red River Valley, Louisiana	Russ, David Perry	Geology	Geology	Ph.D.	1975	Williams, E.G.
Crust-mantle structure in continental South America and its relation to sea floor spreading	Sherburne, Roger Wayne	Geophysics	Geophysics	Ph.D.	1975	Alexander, Shelton S.
Relationships between fracturing, hydrothermal zoning, and copper mineralization at the Big Bug pluton, Big Bug mining district, Yavapai County, Arizona	Sturdevant, James Anton	Geology	Geology	Ph.D.	1975	Rose, A.W.
Structural evolution of the Somport area, West-Central Pyrenees, France and Spain	Verbeek, Earl Raymond	Geology	Geology	Ph.D.	1975	Scholten, Robert
Trace and major element chemistry and the petrogenesis of lavas from the upper portion of San Francisco Mountain, Arizona	Verbeek, Karen Jane Wenrich	Geology	Geology	Ph.D.	1975	White, W.B.; Thornton, C.P.
An integrated profile interpretation of the gravity anomalies over the Benue trough and the younger granite province in Nigeria	Ananaba, Simon Enyinnah	Geophysics	Geophysics	M.S.	1976	Lavin, P.M.
Sulphur Isotopic Fractionation Between H2S So and SO42- in Aqueous Solutions and Possible Mechanisms Controlling Isotopic Equilibrium in Natural Systems	Bahr, John R.	Unknown	Unknown	M.S.	1976	Unknown
Permeability distribution in surficial glacial outwash revealed by a shallow geothermal prospecting technique	Bair, Edwin Scott	Geology	Geology	M.S.	1976	Cordes, S.M.
The geology and the geochemistry of lead and zinc in soils in the Thurman area, southeastern Adirondack Mountains, New York	Cole, David R.	Geology	Geology	M.S.	1976	Unknown
Comparison of patterns from earth resources technology satellite multispectral scanner and glacial drift, Northwestern Pennsylvania	Craig, Richard Gary	Geology	Geology	M.S.	1976	Griffiths, J.C.; Parizek, R.R.
Replacement of Marble by ZnS in Chloride Solutions	D'Andrea, Ralph F.	Geochemistry.	Geochemistry.	M.S.	1976	Unknown
Nonspecific ion exchange of Zn and Ca in a Ca-Montmorillonite	DiGiacomo, Harry Joseph	Geochemistry	Geochemistry	M.S.	1976	Rose, A.W.
A homogeneous, mixed-oxide compositional model for the lower mantle and inferred mantle temperatures	Dobrzykowski, David B.	Geophysics	Geophysics	M.S.	1976	Unknown
The interrelationships between friability and other measured variables in the Chickies formation	Engelder, P. Richard	Geology	Geology	M.S.	1976	Griffiths, J.C.
A sequence of field trips dealing with sedimentary deposition in Clinton County from the late Ordovician Period to the end of the Pennsylvanian Period	Flanigan, Kenneth R.	Earth Science	Earth Science	M.S.	1976	Unknown
The Stability of Sphere: Experimental Redetermination in Geologic Application	Hunt, John A.	Unknown	Unknown	M.S.	1976	Unknown

Petrology of the Eagle Rock volcanic complex, Routt County, northwestern Colorado	Iversen, Gary M.	Geochemistry	Geochemistry	M.S.	1976	Unknown
A field trip to analyze two geologic provinces of the Harrisburg, Pennsylvania area	Jones, Kathleen L.	Earth Science	Earth Science	M.S.	1976	Unknown
The geology and its relationship to the present landscape of Luzerne and surrounding counties	Kishbaugh, James	Earth Science	Earth Science	M.S.	1976	Unknown
Two dimensional finite element direct current electrical resistivity modeling of axially symmetric structures	Kraft, Gordon D.	Geophysics	Geophysics	M.S.	1976	Unknown
Reltation of lineaments to sulfide deposits and fractured zones along the Bald Eagle Mountain: Centre, Blair, and Huntingdon Counties, Pennsylvania.	Krohn, Melvyn Dennis	Geology	Geology	M.S.	1976	Gold, David P.; Rose, A.W.
Neutron Activation Analysis of Na/K Ratios in Fluid Inclusions in Quartz from Gold-Quartz Veins at the O'Brien Mine Quebec Canada	Krupka, Kenneth Michael	Geochemistry and Mineralogy	Geochemistry and Mineralogy	M.S.	1976	Unknown
Unit regional value of the state of California	Labovitz, Mark Larry	Geology	Geology	M.S.	1976	Griffiths, J.C.
Titanate-Silicate Equilibria: Parts of the System Al2O3-TiO2-SiO2-CaO	Langton, Christine A.	Geochemistry.	Geochemistry.	M.S.	1976	Unknown
Economic geology of the WarM.S.pring talc deposit, Inyo County, California	Mazurak, Robert E.	Geology	Geology	M.S.	1976	Unknown
Economic geology of the Warm Spring talc deposit, Inyo County, California	Mazurak, Robert E.	Geology	Geology	M.S.	1976	Unknown
Estimation of wind speed at heights above the surface layer from wind observations near the ground	Nashnosh, Abubaker Yosef	Earth Science	Earth Science	M.S.	1976	Panofsky, H.A.
Pyrite in coal -- its forms and distribution as related to the environments of coal deposition in three selected coals from western Pennsylvania	Reyes-Navarro, Jamie	Geology	Geology	M.S.	1976	Davis, Alan
Solubilization and mobilization of silica in relation to marine sediments	Sukhajintanakan, Warawan	Geology	Geology	M.S.	1976	Guber, A.L.
Geophysical Geochemical and Remote Sensing Studies of Pennsylvania's Thermal Springs	Weinman, Barry L.	Unknown	Unknown	M.S.	1976	Unknown
Abandoned oil and gas wells in Pennsylvania, their effect on the ground-water flow system, and plugging priority for ground-water protection	Westlund, Carlyle W.	Geology	Geology	M.S.	1976	Unknown
Dinoflagellate cyst zonation of some upper Jurassic and lower Cretaceous strata penetrated by the Sun KR Panarctic Skybattle Bay Well, Sverdrup Basin, Arctic Achipelago, Canada	Zeiss, Harvey S.	Geology	Geology	M.S.	1976	Unknown
Sunnyside Mine, Eureka Mining District, San Juan County, Colorado : geochemistry of gold and base metal ore formation in the volcanic environment	Casadevall, Tom	Geochemistry	Geochemistry	Ph.D.	1976	Ohmoto, Hiroshi
Studies of the fate of cell wall polymers of higher plants in peat : a contribution to the geochemistry of coal	Exarchos, Constantine Christos	Geochemistry	Geochemistry	Ph.D.	1976	Given, P.H.
Numerical simulation of fluid flow and energy transport in liquid- and vapor-dominated hydrothermal systems	Faust, Charles Russell	Geology	Geology	Ph.D.	1976	Parizek, R.R.
Cheilostome bryozoans in modern Bermuda reefs, systematics and ecology	Fonda, Shirley Smith	Geology	Geology	Ph.D.	1976	Cuffey, R.J.

Numerical simulation of the multi-layered aquifer system in the Coastal Plain area, Southeastern Pennsylvania	Guswa, John Henry	Geology	Geology	Ph.D.	1976	Parizek, R.R.
An isotopic petrologic study of the contact metamorphism and metasomatism related to copper deposits at Ely, Nevada	Huang, Chi-I	Geochemistry	Geochemistry	Ph.D.	1976	Rose, A.W.; Deines, Peter
Phase equilibria in the erbium-boron system and lattice parameters of the rare earth hexaborides	Imperato, Eugene Garrison	Solid State Science	Earth Science	Ph.D.	1976	Spear, K. E.
Geology and petrology of the two buttes intrusion	Kreiger, Edgar William	Earth Science	Earth Science	Ph.D.	1976	Thornton, C.P.
Factors controlling the water chemistry beneath a floodplain in a carbonate terrane, Central Pennsylvania	Krothe, Noel Calvin	Geology	Geology	Ph.D.	1976	Parizek, R.R.
The atmosphere of Jupiter : experimental formation of Jovian colors	Miller, Floyd	Earth Science	Earth Science	Ph.D.	1976	Dachille, Frank
Mixed-volatile equilibria in calcareous rocks of three contact metamorphic aureoles in the Western United States	Moore, Joseph Neal	Geology	Geology	Ph.D.	1976	Kerrick, Derrill
Crystal chemistry, vibrational spectra, and luminescence studies of rare earth sulfides with the $Th^3 P^4$ structure	Provenzano, Paul Louis	Solid State Science	Earth Science	Ph.D.	1976	White, W. B.
Mineralogic, fluid inclusion, and stable isotope studies of the stratabound copper deposits at the Raul Mine, Peru, South America	Ripley, Edward Michael	Geochemistry	Geochemistry	Ph.D.	1976	Ohmoto, Hiroshi
The effects of order/disorder on the vibrational spectra of minerals	Scheetz, Barry Earl	Geochemistry and Mineralogy	Geochemistry and Mineralogy	Ph.D.	1976	White, W.B.
Liquid-solid equilibria involving spinel, ilmenite and ferropseudobrookite in the system iron oxide - $Al^2 O^3$ - Ti O^2 with implications for lunar and terrestrial petrology	Schreifels, Walter Arthur	Geochemistry and Mineralogy	Geochemistry and Mineralogy	Ph.D.	1976	Muan, A.I.
Inorganic and isotopic geochemistry of the unsaturated zone in a carbonate terrane	Sears, Stephen O'Reilly	Geochemistry	Geochemistry	Ph.D.	1976	Langmuir, Donald
Experimental determination and thermodynamic calculation of equilibria in the system CaO MgO-SiO^2-H^2O-CO^2	Slaughter, John	Geochemistry and Mineralogy	Geochemistry and Mineralogy	Ph.D.	1976	Kerrick, D.M.
Determination of seismic source parameters using far-field surface wave spectra	Turnbull, Lawrence Sturtevant	Geophysics	Geophysics	Ph.D.	1976	Alexander, S.S.; Greenfield, R.J.
The effect of reduced activity of anorthite on the reaction grossular + Quartz = anorhite + wallastonite : a model for plagioclase in the earth's lower crust and upper mantle	Windom, Kenneth Earl	Mineralogy and petrology	Mineralogy and petrology	Ph.D.	1976	Boettcher, A.L.
The crystal chemistry of a Zn-Li silicate and defect substructure of augitic pyroxenes and their implications	Yu, Shu-cheng	Mineralogy and petrology	Mineralogy and petrology	Ph.D.	1976	Smith, D.K.
A Study of Fractures Along the Western Segment of the Tyrone-Mount Union Lineament	Canich, Michael	Geology	Geology	M.S.	1977	Gold, David P.
Stratigraphy and geochemistry of the Mount Belknap Series, Tushar Mountains, Utah	Carmony, John Rodman	Geology	Geology	M.S.	1977	Rose, A.W.
Chemical and mineralogical interaction of acid mine drainage with streaM.S.ediment, Babb Creek, Tioga County, Pennsylvania	Crouse, Harry Lynn	Geochemistry	Geochemistry	M.S.	1977	Rose, A.W.

Chemical and mineralogical interaction of acid mine drainage with stream sediment, Babb Creek, Tioga County, Pennsylvania	Crouse, Harry Lynn	Geochemistry	Geochemistry	M.S.	1977	Rose, A.W.
The relation of spring discharge behavior to the hydrologic properties of carbonate aquifers	Gaither, Bruce Edward	Geology	Geology	M.S.	1977	White, W.B.
Digital simulation of the yield potential of the Elliot Park-Burgoon aquifer in Eastern Clearfield and western Centre Counties, Pennsylvania	Gerhart, James M.	Geology	Geology	M.S.	1977	Unknown
The geology and water resources of the Milesburg-Sayers Dam area, Pennsylvania	Gough, William R.	Geology	Geology	M.S.	1977	Unknown
Transformational superplasticity of the CsCl-RbCl solid solution	Holmes, Thomas C.	Geophysics	Geophysics	M.S.	1977	Unknown
The environmental geology of the Pine Grove Mills-Stormstown Area, Central Pennsylvania : with emphasis on the Bedrock geology and ground water resources	Hunter, Philip Mark	Geology	Geology	M.S.	1977	Parizek, R.R.
South African and Lesothan kimberlites : with emphasis on the variation of the stable carbon and oxygen isotopic composition of kimberlite carbonates	Kobelski, Bruce J.	Geology	Geology	M.S.	1977	Unknown
Radon in stream and ground waters of Pennsylvania as a reconnaissance exploration technique for uranium deposits	Korner, Lisa Ann	Geochemistry	Geochemistry	M.S.	1977	Rose, A.W.
Oriented cut sections of multilaminar cheilostome bryozoans from the modern Bermuda reefs	Kosich, Deborah Frances	Geology	Geology	M.S.	1977	Cuffey, R.J.
Petrology of the Mt. Owen stock, Gunnison County, Colorado : the genesis of K-feldspar phenocrysts in porphyritic rocks	Kramer, John Howard	Geochemistry	Geochemistry	M.S.	1977	Unknown
A detailed gravity and magnetic interpretation of the structure and deformational history of the Jacksonwald syncline, Berks County, Pennsylvania	Kusiak, John Robert	Geophysics	Geophysics	M.S.	1977	Unknown
A determination of the isothermal bulk modulus of stishovite and its first pressure derivative froM.S.tatic compression data	Kuzio, Michael R.	Geophysics	Geophysics	M.S.	1977	Unknown
A determination of the isothermal bulk modulus of stishovite and its first pressure derivative from static compression data	Kuzio, Michael R.	Geophysics	Geophysics	M.S.	1977	Unknown
A Multivariate analysis of lithologic coloration within the Catskill Formation	Love, John Eric	Geology	Geology	M.S.	1977	Griffiths, J.C.
Lithologic variability of the Kings Mountain pegmatite, North Carolina	Luster, Gordon Ray	Geology	Geology	M.S.	1977	Unknown
An individualized approach to the development of a major river system: The Colorado River for example	McIntosh, William	Earth Science	Earth Science	M.S.	1977	Unknown
A petrographic classification of solid residues for the evaluation of coal performance during the hydrogenation of bituminous coals	Mitchell, Gareth D.	Geology	Geology	M.S.	1977	Davis, Alan
Analysis of the relationships between the fundamental properties and the derived qualities of 44 samples of lower kittaning underclay	Onasch, Christine Condon	Geology	Geology	M.S.	1977	Griffiths, J.C.

Hydrogeological implications of various wastewater management proposals for the Falmouth area of Cape Cod, Massachusetts	Palmer, Carl D.	Geology	Geology	M.S.	1977	Unknown
Gravity and magnetic studies of the Everett and Mason-Dixon lineaments in Southcentral Pennsylvania	Quaah, Amos Ofori	Geophysics	Geophysics	M.S.	1977	Lavin, P.M.
The Temporal-morphologic analysis of three Upper Devonian brachiopods from north-central Iowa	Riggins, Earl Michael	Geology	Geology	M.S.	1977	Guber, A.L.
The reference-correction method for improving accuracy in the seismic location of trapped coal miners	Ruths, Mark A.	Geophysics	Geophysics	M.S.	1977	Unknown
Geology and geochemistry of uranium deposits near Penn Haven Junction, Carbon County, Pennsylvania	Schmiermund, Ronald Lee	Geochemistry	Geochemistry	M.S.	1977	Rose, A.W.
Geomorphology and geology of Cape Cod : past, present and future	Terzakis, George N.	Earth Science	Earth Science	M.S.	1977	Unknown
The mixed phase reflection seismic wavelet : its determination and extraction on the complex Z plane	Tobias, Steven Martin	Geophysics	Geophysics	M.S.	1977	Alexander, Shelton S.
An appraisal of the mineral resources of New Zealand	Watson, Alicia Tyler	Geochemistry and Mineralogy	Geochemistry and Mineralogy	M.S.	1977	Griffiths, J.C.
Palynology of the paleocene-eocene Golden Valley formation of Western North Dakotas	Bebout, John Wardell	Geology	Geology	Ph.D.	1977	Traverse, Alfred
The Occurrence and crystal chemistry of nickel in silicate and hydroxide minerals	Bish, David Lee	Mineralogy and petrology	Mineralogy and petrology	Ph.D.	1977	Brindley, G.W.
Vibrational spectra in relationship to bonding and structure in selected crystalline sulfide spinels, rare earth oxysulfides, and A-type rare earth sesquioxides	Boldish, Steven I.	Solid State Science	Earth Science	Ph.D.	1977	Unknown
Multivariate analysis of petrographic and chemical properties influencing porosity and permeability in selected carbonate aquifers in Central Pennsylvania	Brown, Charles Edward	Geology	Geology	Ph.D.	1977	Parizek, R.R.
The palynostratigraphy and age of the Newark supergroup	Cornet, Walter Bruce	Geology	Geology	Ph.D.	1977	Traverse, A.F.
Experimental calibration of the quartz-magnetite oxygen isotope geothermometer	Downs, William Fredrick	Geochemistry	Geochemistry	Ph.D.	1977	Deines, Peter
Multivariate analysis of petrographic and chemical data from the Aldridge Formation, Southern Purcell Mountain Range, British Columbia, Canada	Edmunds, Frederick Robin	Mineralogy and petrology	Mineralogy and petrology	Ph.D.	1977	Griffiths, J.C.
An experimental determination of rare earth partition coefficients between a chloride-containing aqueous phase and silicate melts	Flynn, Ronald Thomas	Geochemistry and Mineralogy	Geochemistry and Mineralogy	Ph.D.	1977	Bernham, C.W.
The Source of compositional variation in late Pleistocene sands from Accomack County, Virginia	Krajewski, Stephen	Earth Science	Earth Science	Ph.D.	1977	Williams, E.G.
Geological, fluid inclusion, and stable isotope studies of the Upper Mississippi Valley zinc-lead district, southwest Wisconsin	McLimans, Roger Kenneth	Geochemistry	Geochemistry	Ph.D.	1977	Barnes, H.L.; Ohmoto, Hiroshi
The Unit regional value of the Republic of South Africa	Menzie, W. D.	Geology	Geology	Ph.D.	1977	Griffiths, J.C.
A geochemical study of the inorganic constituents in some low-rank coals	Miller, Robert Norman	Geochemistry	Geochemistry	Ph.D.	1977	Given, P.H.

Structural evolution of the western margin of the Idaho batholith in the Riggins, Idaho, area	Onasch, Charles Martin	Geology	Geology	Ph.D.	1977	Scholten, Robert
Geology of the central Black Mountains, Death Valley, California : the turtleback terrane	Otton, James Kieth	Geology	Geology	Ph.D.	1977	Wright, L.A.; Gold, David P.
Characterization of variation in grain size and heavy mineral content of trail ridge sediments	Pirkle, Frederic Lee	Geology	Geology	Ph.D.	1977	Griffiths, J.C.
Wreford fenestrates : important bryozoans in a low Permian Megacyclothem in Kansas, Oklahoma, and Nebraska	Simonsen, August Henry	Earth Science	Earth Science	Ph.D.	1977	Cuffey, R.J.
Processes, responses, and resulting stratigraphic sequences of barrier island tidal inlets as deduced from Assawoman Inlet, Virginia	Slingerland, Rudy	Geology	Geology	Ph.D.	1977	Williams, Eugene G.
Modern Bermuda lichenoporids : their skeletal morphology, variability, and reefal ecology	Soroka, Leonard Gregory	Earth Science	Earth Science	Ph.D.	1977	Cuffey, R.J.
Yorktown cerioporids from Colerain Beach--globular cyclostome bryozoans in Pliocene-? Miocence shelly sands along the Chowan River in northeastern North Carolina	Sorrentino, Anthony Vincent	Earth Science	Earth Science	Ph.D.	1977	Cuffey, R.J.
The Paleomagnetism of Mesozoic diabase and the deformational history of Southeastern Pennsylvania	Volk, Karen Wagner	Geophysics	Geophysics	Ph.D.	1977	Lavin P.M.; Rose, A.W.
The geology of Huntingdon County, Pennsylvania	Everly, Robert A.	Earth Science	Earth Science	M.Ed.	1978	Unknown
A ground-based study of the Everett-Bedford lineament in Pennsylvania	Abriel, William Lee	Geophysics	Geophysics	M.S.	1978	Alexander, Shelton
Development and utilization of a resource unit on weathering and erosion for eighth grade earth science	Adams, Bruce E.	Earth Science	Earth Science	M.S.	1978	Unknown
Solution mining of sedimentary uranium deposits : factors influencing the solution rate of uranium dioxide under conditions applicable to in situ leaching	Amell, Alexander Renton	Geochemistry	Geochemistry	M.S.	1978	Unknown
Ground Water Geochemistry as a Prospecting Tool for Uranium Deposits in Pennsylvania	Applin, Kenneth R.	Geochemistry.	Geochemistry.	M.S.	1978	Rose, Arthur
Some foraminifera from the Heron Island Reef	Arnstein-Breuer, Roberto John	Geology	Geology	M.S.	1978	Guber, A.L.
Schlerospongees -- comparative generalities, modern species, Enewetak reef-dwellers, and Turkish fossils	Basile, Laura Lorraine	Geology	Geology	M.S.	1978	Cuffey, R.J.
Application of two multivariate classification techniques to the problem of seismic discrimination	Bell, Alan G. R.	Geophysics	Geophysics	M.S.	1978	Unknown
The unit regional value of the mineral resources of Mexico	Chavez-Martinez, Luis	Geology	Geology	M.S.	1978	Griffiths, J.C.
Effects of mine openings on seismic waves : a two-dimensional model study	Christen, Randolph F.	Geophysics	Geophysics	M.S.	1978	Greenfield, Roy
The System CrO-SiO2 at Low Oxygen Partial Pressures	Collins, Henry B.	Unknown	Unknown	M.S.	1978	Unknown
Reduction of sulfate by methane, xylene, and iron at temperatures of 175 to 350 C	Drean, Thomas Allen	Geochemistry and Mineralogy	Geochemistry and Mineralogy	M.S.	1978	Ohmoto, Hiroshi

Structural analysis of the central Tobacco Root Mountains, southwest Montana	Duncan, Douglas Wells	Geology	Geology	M.S.	1978	Scholten, Robert
Environmental and depth variations in Enewetak Favia	Haggerty, Janet Ann	Geology	Geology	M.S.	1978	Cuffey, R.J.; Deines, Peter
Partition of oxygen isotopes and trace elements between carbonate and silicate melts at 1 kilobar, 800 0 C and its bearing on the origin of carbonatite	Hsi, Ching-Kuo D.	Geochemistry and Mineralogy	Geochemistry and Mineralogy	M.S.	1978	Unknown
The Distribution of Lead in Hypersolvus and Subsolvus Granites	Lewis, Alvin.	Geochemistry.	Geochemistry.	M.S.	1978	Unknown
Geology and geochemistry of uranium deposits near Beaver Lake, Sullivan County, Pennsylvania	Mahar, Dennis Lee	Geochemistry	Geology	M.S.	1978	Rose, A.W.
The relationship of geophysical and remote sensing lineaments to regional structure and kimberlite intrusions in the Appalachian Plateau of Pennsylvania	Parrish, Jay Bennett	Geophysics	Geophysics	M.S.	1978	Gold, David
The geology and mineral deposits of Jacks Mountain, in the Mount Union and Butler Knob 7 1/2-minute quadrangles, Central Pennsylvania	Schasse, Henry William	Geology	Geology	M.S.	1978	Rose, A.W.
A hydrogeologic and numerical simulation feasibility study of connector well dewatering of underground coal mines, Madera, Pennsylvania	Schubert, Jeffrey P.	Geology	Geology	M.S.	1978	Unknown
Hydrogeology, ground-water quality and waste-water management : Nassau and Suffolk Counties, New York	Sgambat, Jeffrey P.	Geology	Geology	M.S.	1978	Unknown
Kinetics of interaction between biotite adamellite, granitic gneiss and aqueous sodium chloride solutions	Solomon, George Cleve	Geochemistry and Mineralogy	Geochemistry and Mineralogy	M.S.	1978	Kerrick, Derrill M.
Sulfur isotope study of sulfate and sulfide minerals froM.S.ome hydrothermal ore deposits	Visut Pisutha-Arnond	Geochemistry	Geochemistry	M.S.	1978	Unknown
Sulfur isotope study of sulfate and sulfide minerals from some hydrothermal ore deposits	Visut Pisutha-Arnond	Geochemistry	Geochemistry	M.S.	1978	Ohmoto, Hiroshi
Study of the interrelationships among chemical and petrographic variables of United States coals	Waddell, Claudia True	Geology	Geology	M.S.	1978	Davis, Alan
Geochemistry of heavy metals in the C horizon of a sandy loaM.S.oil in Pennsylvania	Wright, John Clinton	Geochemistry	Geochemistry	M.S.	1978	Langmuir, Donald
Geochemistry of heavy metals in the C horizon of a sandy loam soil in Pennsylvania	Wright, John Clinton	Geochemistry	Geochemistry	M.S.	1978	Langmuir, Donald
The melting of plagioclase in the systeM.S.odium oxide-calcium oxide-aluminum oxide-silicon oxide-water at high pressure and temperature	Furst, George Arrowsmit	Mineralogy and petrology	Mineralogy and petrology	Ph.D.	1978	Burnham, C.W.
The melting of plagioclase in the system sodium oxide-calcium oxide-aluminum oxide-silicon oxide-water at high pressure and temperature	Furst, George Arrowsmit	Mineralogy and petrology	Mineralogy and petrology	Ph.D.	1978	Burnham, C.W.
Dissolution and precipitation of lead sulfide in hydrothermal solutions, and the point defect chemistry of galena	Giordano, Thomas Henry	Geochemistry	Geochemistry	Ph.D.	1978	Barnes, H.L.

The petrogenesis of the Ice Harbor Member, Columbia Plateau, Washington : a chemical and experimental study	Helz, Rosalind Tuthill	Geochemistry and Mineralogy	Geochemistry and Mineralogy	Ph.D.	1978	Burnham, C.W.
Petrology and stratigraphy of some Pottsville quartzites and graywackes of West Virginia	Houseknecht, David Wayne	Geology	Geology	Ph.D.	1978	Williams, E.G.
Anisotropy of vitrinite reflectance in relation to coal metamorphism for selected United States coals	Hower, James Clyde	Geology	Geology	Ph.D.	1978	Davis, Alan
Unit regional value of the dominion of Canada	Labovitz, Mark Larry	Geology	Geology	Ph.D.	1978	Griffiths, J.C.; Gold, David P.
Experimental determination of oxygen isotopic fractionation between water hydrous silicate melts	Shettel, Don Landis	Geochemistry and mineralogy	Geochemistry and mineralogy	Ph.D.	1978	Burnham, C.W.; Ohmoto, Hiroshi
Megaspores and the Devonian-Mississippian boundary along Route 322, Centre County, Pennsylvania	Stolar, John	Earth Science	Earth Science	Ph.D.	1978	Traverse, A.F.
Evaluation of a surficial application of limestone and flue dust in the abatement of acidic drainage: Jonathan Run Drainage Basin at Interstate 80, Centre County, Pennsylvania	Waddell, Richard Kent	Geology	Geology	Ph.D.	1978	Parizek, R.R.
The kinetics of the pseudobrookite decomposition reaction and its application to problems in lunar petrology	Weirauch, Douglas Allan	Geochemistry	Geochemistry	Ph.D.	1978	Muan, Arnulf
Phase relations in the iron oxide-chromium oxide-titanium oxide-aluminum oxide system at low oxygen pressures and their bearing on lunar petrogenesis	Welch, Jane Marie	Geochemistry and Mineralogy	Geochemistry and Mineralogy	Ph.D.	1978	Muan, Arnulf
Investigations bearing on the origins of potassic magmas: I. Melting relations in the system kalsilite-forsterite-silica-carbon dioxide to 30 kilobars, and II. Stability of phlogopite in natural spinel lherzolite and in the system K^2 O - Mg O- Al^2 O^3 - Si O^2 - H^2 O- C O^2 as a function of volatile composition at high pressures and high temperatures	Wendlandt, Richard Fredrick	Geochemistry and Mineralogy	Geochemistry and Mineralogy	Ph.D.	1978	Eggler, Luther H.
An analysis of five current hyoptheses related to field identification and mapping of lineaments in Centre County, Pennsylvania	Snook, William Ross	Earth Science	Earth Science	B.S.	1979	Parizek, Richard R.
Third derivative analysis of gravity anomalies from prismatic sources	Biadgelgne, Abraham	Geophysics	Geophysics	M.S.	1979	Unknown
Spectral excitation of Lg within the south-central Appalachian region	Cybriwsky, Zenon A.	Geophysics	Geophysics	M.S.	1979	Unknown
Palynostratigraphy and paleoecology of the La Ventana Formation, Cretaceous (Maestrichtian) San Juan Basin, New Mexico	Delfel, Deborah Lynn	Geology	Geology	M.S.	1979	Traverse, A.F.
An experimental and theoretical investigation of plagioclase melting relations	Erikson, Robert L.	Geochemistry and Mineralogy	Geochemistry and Mineralogy	M.S.	1979	Burnham, Wayne
Relationship between the cross-strike lineaments and the distribution of oil and gas fields in Northwestern Pennsylvania	Famy, Syed Mohamad	Geology	Geology	M.S.	1979	Gold, David P.
The low-temperature, aqueous solution chemistry of SnO^2 (cassiterite)	Fleer, Varda Nanette	Geochemistry and Mineralogy	Geochemistry and Mineralogy	M.S.	1979	Barnes, H.L.

Sources of stormflow from a forested watershed and a carbonate spring in Central Pennsylvania determined by natural deuterium variations	Gander, Craig Robert	Geochemistry and Mineralogy	Geochemistry and Mineralogy	M.S.	1979	Deines, Peter
Determination of depth extent of tabular dikes by wavenumber-domain magnetic interpretation	Griffiths, Sally A.	Geophysics	Geophysics	M.S.	1979	Unknown
Characterization of Scales Formed froM.S.alton Sea Geothermal Brines	Hayba, Daniel O.	Geochemistry.	Geochemistry.	M.S.	1979	Unknown
Characterization of Scales Formed from Salton Sea Geothermal Brines	Hayba, Daniel O.	Geochemistry.	Geochemistry.	M.S.	1979	Unknown
State College, Pennsylvania, crustal structure by modeling of long-period P-wave forms from teleseismic earthquakes	Isaacs, Charles Manning, Jr.	Geophysics	Geophysics	M.S.	1979	Unknown
An automated microscopical method for the characterization of pyrite in coal	Kuehn, Kenneth William	Geology	Geology	M.S.	1979	Davis, A.
Structural-compositional models of the lunar interior and interpretation of observed estimates of the moon's fundamental spheroidal free oscillations	Loudin, Michael George	Geophysics	Geophysics	M.S.	1979	Unknown
Comparison of water quality from three surface coal mine spoils with different type and age of restoration, Clarion County, Pennsylvania	Martin, Mary Margaret	Geology	Geology	M.S.	1979	Parizek, R.R.
Stratigraphy and depositional environments of the carbonate-terrigenous member of the Crystal Spring formation, Death Valley, California	Maud, Randall Lee	Geology	Geology	M.S.	1979	Wright, L.A.
Preliminary investigation of mineral precipitation from the Salton Sea geothermal brines	Murowchick, James Bernard	Geochemistry	Geochemistry	M.S.	1979	Unknown
Analysis of the relationships between composition and the occurrence of bloating shales and clays in the Pennsylvanian System of Western Pennsylvania	Oldham, David Wayne	Geology	Geology	M.S.	1979	Williams, Eugene G.
Modelling heavy metal sorption froM.S.ubsurface waters with the n-power exchange function	Ozsvath, David	Geochemistry and Mineralogy	Geochemistry and Mineralogy	M.S.	1979	Unknown
Modelling heavy metal sorption from subsurface waters with the n-power exchange function	Ozsvath, David	Geochemistry and Mineralogy	Geochemistry and Mineralogy	M.S.	1979	Unknown
Investigation of fracture traces and underground roof fall fatalities in the southern anthracite field, Pennsylvania	Petrus, Carolyn Ann	Geology	Geology	M.S.	1979	Gold, David P.; Parizek, R.R.
Ultrasonic determination of elastic properties of the olivine, $(Mg, Fe)^{2}SiO^{4}$, solid solution series	Resley, William E.	Geophysics	Geophysics	M.S.	1979	Unknown
Univariate and multivariate analysis of water well yields as related to fracture traces and lineaments in the Martinsburg shale in Eastern Pennsylvania	Spiller, Reginal Wayne	Geology	Geology	M.S.	1979	Parizek, R.R.
The role of bending in block-glide landslides and overthrust faults : an analytical model	Sweigard, Richard Joseph	Geology	Geology	M.S.	1979	Voight, Barry
The uranium content of zircons from the Catskill Formation, Eastern Pennsylvania	Tole, Peter Mwakio	Geochemistry and Mineralogy	Geochemistry and Mineralogy	M.S.	1979	Rose, A.W.
Geological and geochemical studies of the woodbury zinc and lead occurrences, Bedford County, Pennsylvania	Tregaskis, Scott Wyatt	Geochemistry and Mineralogy	Geochemistry and Mineralogy	M.S.	1979	Rose, A.W.

Geology of Horse Shoe Curve type Devonian to lower Pennsylvanian	Vonarx, Clifford E.	Earth Science	Earth Science	M.S.	1979	Unknown
An assessment of the mineral resources of the United Kingdom and Republic of Ireland	Walsh, Deborah Anne	Geology	Geology	M.S.	1979	Griffiths, J.C.
Phase-relationships, vibrational spectra and luminescence studies in rare earth (Y, Gd) - phosphate systems	Agrawal, Dinesh Kumar	Solid State Science	Earth Science	Ph.D.	1979	White, William B.
Depositional environment of the Kentucky No. 12 coal bed (middle Pennsylvanian) of western Kentucky, with special reference to the origin of coal lithotypes	Austin, Steven A.	Geology	Geology	Ph.D.	1979	Davis, Alan
A simulation model of landform erosion	Craig, Richard Gary	Geology	Geology	Ph.D.	1979	Griffiths, J.C.
Effect of transformation on superplastic properties within the olivine-spinel transition zone of the Earth's mantle	Dein, James Lindall	Geophysics	Geophysics	Ph.D.	1979	Greenfield, Roy J.
The stratigraphy, depositional environments and quantitative petrography of the Precambrian-Cambrian Wood Canyon Formation, Death Valley	Diehl, Paul Emmett	Geology	Geology	Ph.D.	1979	Wright, Lauren A.; Williams, Eugene G.
Application of the unit regional value concept to a study of the mineral resources of Australia	Engelder, P. Richard	Geology	Geology	Ph.D.	1979	Griffiths, J.C.
Petrology and depositional environments of Alabama tertiary lignites	Gutzler, Robert Quenton	Geology	Geology	Ph.D.	1979	Spackman Jr., William
A reconnaissance survey of bryozoan distribution within the keyser limestone (Silurian-Devonian) of Central Pennsylvania	Miller, Charles E.	Earth Science	Earth Science	Ph.D.	1979	Cuffey, R.J.
Uranium and other elements in the Catskill formation of East-Central Pennsylvania	Pirc, Simon	Geochemistry and Mineralogy	Geochemistry and Mineralogy	Ph.D.	1979	Rose, A.W.
Stratigraphy and sedimentology of the upper Devonian Catskill and uppermost trimmers rock formations in central Pennsylvania	Rahmanian, Victor David Kh.	Geology	Geology	Ph.D.	1979	Williams, E.G.
The origin and development of tree islands in the Okefenokee Swamp, as determined by peat petrography and pollen stratigraphy	Rich, Fredrick James	Geology	Geology	Ph.D.	1979	Spackman Jr., William
The kinetics of silica-water reactions	Rimstidt, James Donald	Geochemistry	Geochemistry	Ph.D.	1979	Barnes, H.L.
High-temperature mechanical properties of basalt	Ryan, Michael P.	Geochemistry and Mineralogy	Geochemistry and Mineralogy	Ph.D.	1979	Burnham, C.W.
A new surface-wave inversion method for determining lateral variations in crust-mantle structure with application to China	Yeh, Yeong Tein	Geophysics	Geophysics	Ph.D.	1979	Alexander, Shelton S.
Low-level radioactive wastes	Johnston, Trudy E.	Earth sciences	Earth sciences	B.S.	1980	Unknown
The crystal structure of weeksite	Anderson, Christine Alexis	Mineralogy	Mineralogy	M.S.	1980	Unknown
Geology for development planning in the Moshannon Valley Region, Centre and Clearfield Counties, Pennsylvania	Bachman, Leon Joseph	Geology	Geology	M.S.	1980	Parizek, R.R.
Regional uranium and thorium anomalies associated with sedimentary uranium deposits in Pennsylvania and Colorado	Bell, Christy Anne	Geochemistry and Mineralogy	Geochemistry and Mineralogy	M.S.	1980	Rose, A.W.

Structural analysis of the Thierry copper-nickel deposit in Northwest Ontario, Canada	Cameron, Peter John	Geology	Geology	M.S.	1980	Gold, David P.
Crystal growth and the formation of chemical zoning in natural garnets	Cygan, Randall Timothy	Geochemistry and Mineralogy	Geochemistry and Mineralogy	M.S.	1980	Lasaga, Antonio C.
Two methods of automatic depth determination applied to a study of the magnetic basement of western Pennsylvania	Davis, Willard Frew	Geophysics	Geophysics	M.S.	1980	Lavin, P.M.
Metamorphic equilibria in the siliceous dolomite system : 6 Kb experimental data and geologic implications	Eggert, Roderick Glenn	Geochemistry and Mineralogy	Geochemistry and Mineralogy	M.S.	1980	Kerrick, Darryl
The tectonics of the Caribbean plate	François, Darryl K.	Geophysics	Geophysics	M.S.	1980	Unknown
Factors influencing streambed infiltration for selected streams in the Western Middle anthracite field, Pennsylvania	Garabedian, Stephen Paul	Geology	Geology	M.S.	1980	Parizek, R.R.
Geochemical and mineralogical investigations of methods for detecting kimberlites in the area of the Stockdale Kimberlite, Riley County, Kansas	Hanson, Clifford Gail	Geochemistry and Mineralogy	Geochemistry and Mineralogy	M.S.	1980	Rose, A.W.; Gold, David P.
Crustal models for the Scranton and Kentucky gravity highs : regional bending of the crust in response to emplacement of failed rift structures	Hawman, Robert Barrett	Geophysics	Geophysics	M.S.	1980	Lavin, P.M.
Inversion for fault dislocation using teleseismic body waves	Henson, Ivan Hendrix	Geophysics	Geophysics	M.S.	1980	Unknown
Fracture analysis near the Mid-Atlantic ridge boundary, Reykjavik-Hvalfjordur area, Iceland	Jefferis, Robert Gilpin	Geology	Geology	M.S.	1980	Voight, Barry
Radium and uranium contents of limonites from Pennsylvania and Wyoming	Karasevich, Ellen Lee Richter	Geology	Geology	M.S.	1980	Rose, A.W.
Structure of the Pre-Beltian metamorphic rocks of the northern Ruby Range, southwestern Montana	Karasevich, Lawrence Paul	Geology	Geology	M.S.	1980	Scholten, Robert
Offshore Transgressive Peat Deposits of Southwest Florida: Evidence for a Late Holocene Rise of Sea Level	Kuehn, D. W. (Deborah Wilbur)	Geology	Geology	M.S.	1980	Spackman, William
Recent faulting in California examined from remotely sensed data and seismicity	Lee, Barbara Jeanette	Geophysics	Geophysics	M.S.	1980	Unknown
Partial melting of peridotite in the presence of small amounts of volatiles, with special reference to the low-velocity zone	Olafsson, Magnus	Geochemistry	Geochemistry	M.S.	1980	Unknown
Static lattice models for higher-order elastic properties in face-centered cubic crystals : implications for the lower mantle	Prosser, Rex Michael	Geophysics	Geophysics	M.S.	1980	Unknown
Utility of digitally merged Seasat-A SAR, Landsat MSS, and magnetic field data sets for mapping lithology and structure in a vegetated terrain	Ravenhurst, Casey Edward	Geophysics	Geophysics	M.S.	1980	Alexander, Shelton S.
The depth interpretation of gravity data for drift-filled valleys in Erie County, Pennsylvania	Rhodes, John A.	Geophysics	Geophysics	M.S.	1980	Unknown
Predicting groundwater flows to underground coal mines in western Pennsylvania	Roebuck, Sheila Joan	Geology	Geology	M.S.	1980	Parizek, R.R.

Distribution of Iron Chromium and Aluminum Among Coexisting Phases as Illustrated by the Phase Assemblage Spinel Mullite Silica Sesquioxide and Liquid in the System Iron Oxide-Aluminum Oxide-Silica-Chromium Oxide at Various Oxygen Pressures	Sentner, David A.	Unknown	Unknown	M.S.	1980	Unknown
Stratigraphic and sedimentologic controls for copper and uranium in red-beds of the upper Devonian Catskill formation in Pennsylvania	Smith, Arthur Tremaine	Geology	Geology	M.S.	1980	Rose, Arthur
The application of geostatistics to a portion of the Pittsburgh Coal Seam	Thompson, Douglas Everett	Mineral economics	Mineral economics	M.S.	1980	Unknown
A Relection Seismic Survey of the Vema Fracture Zone on the Mid-Atlantic Ridge	Varchol, Douglas J.	Geophysics	Geophysics	M.S.	1980	Unknown
The hydrogeology of the Danville Area,Pennsylvania	Williams, J. Herbert (John Herbert)	Geology	Geology	M.S.	1980	Parizek, R.R.
The crystal structure and twinning of meta-uranocircite	Zolensky, M. E. (Michael E.)	Geochemistry and Mineralogy	Geochemistry and Mineralogy	M.S.	1980	Smith, D.K.
Numerical simulation of the hydrogeologic effects of open-pit anthracite mining	Bair, Edwin Scott	Geology	Geology	Ph.D.	1980	Parizek, R.R.
A palynological investigation of postglacial sediments at two locations along the continental divide near Helena, Montana	Brant, Lynn Alvin	Earth Science	Earth Science	Ph.D.	1980	Spackman Jr., William; Traverse, Alfred
Geology and electrical and electromagnetic modeling of volcanogenic sulfide bodies near savant Lake Ontario	Campbell, Bruce Samuel	Geophysics	Geophysics	Ph.D.	1980	Greenfield, Roy J.; Gold, David P.
A model of the formation of acid in coal-fired power plant plumes	Chelius, Carl Robert	Earth Science	Earth Science	Ph.D.	1980	Rosa, G. de Pena
Mechanisms and rates of stable isotopic exchange in hydrothermal rock-water systems	Cole, David Robert	Geochemistry and Mineralogy	Geochemistry and Mineralogy	Ph.D.	1980	Ohmoto, Hiroshi
Bryozoans and bryozoan-like corals : affinities and variability of Diplotrypa, Monotrypa, Labryrinthities, and Cladopora (Trepostomata and Tabulata) froM.S.elected Ordovician-Silurian Reefs in Eastern North America (Newfoundland, Pennsylvania, Michigan)	Davidheiser, Carolyn Elizabeth	Earth Science	Earth Science	Ph.D.	1980	Cuffey, R.J.
Bryozoans and bryozoan-like corals : affinities and variability of Diplotrypa, Monotrypa, Labryrinthities, and Cladopora (Trepostomata and Tabulata) from selected Ordovician-Silurian Reefs in Eastern North America (Newfoundland, Pennsylvania, Michigan)	Davidheiser, Carolyn Eliza	Earth Science	Earth Science	Ph.D.	1980	Cuffey, R.J.
Geology and geochronology of the Halloran Hills, southeastern Calif ornia, and implications concerning Mesozoic Tectonics of the southwestern cordillera	DeWitt, Ed Howard	Geology	Geology	Ph.D.	1980	Wright, Lauren A.
The development and evaluation of an automated reflectance microscope system for the petrographic characterization of bituminous coals	Hoover, David Samuel	Geology	Geology	Ph.D.	1980	Davis, Alan

Mechanisms controlling the inorganic and isotopic geochemistry of springs in a carbonate terrane	Hull, Laurence Charles	Geophysics	Geophysics	Ph.D.	1980	Deines, Peter
Axisymmetric numerical simulation of hydrothermal systems including changes in porosity and permeability due to the quartz-water reaction	Li, Todd Ming Chun	Geophysics	Geophysics	Ph.D.	1980	Greenfield, Roy J.
Safe-yield estimates of a water supply reservoir on an ungaged stream	Ousey, John Russell	Earth Science	Earth Science	Ph.D.	1980	Parizek, R.R.
Hydrothermal sediments of the Red Sea, Atlantis II deep: a model for massive sulfide-type ore deposits	Pottorf, Robert John	Geochemistry	Geochemistry	Ph.D.	1980	Barnes, H.L.
A petrographic, chemical, and experimental study of kaersutite occurrences at Dish Hill, California, with implications for volatiles in the upper mantle	Stewart, Dion Carlyle	Mineralogy and petrology	Mineralogy and petrology	Ph.D.	1980	Eggler, David H.
Geomorphology of the falls stretch of the Potomac River	Tormey, Brian B.	Earth Science	Earth Science	Ph.D.	1980	Miller, E. Willard
Moment tensor inversion of complex earthquakes : the 1978 Thessaloniki, Greece earthquake	Barker, Jeffrey S.	Geophysics	Geophysics	M.S.	1981	Langston, Charles
Implications of regional gravity and magnetic data for structure beneath western Pennsylvania	Chaffin, David Leland	Geophysics	Geophysics	M.S.	1981	Lavin, P.M.
On the application of teleseismic body wave modeling to study the source characteristics and tectonic implications of the Kalapana, Hawaii foreshock-mainshock sequence of November 29, 1975	Dermengian, John Michael	Geophysics	Geophysics	M.S.	1981	Unknown
Geology and tectonic implications of the Deer Canyon area, Tendoy Range, Montana	DuBois, Dean Paul	Geology	Geology	M.S.	1981	Scholten, Robert
The kinetics of uranium dioxide dissolution in acidic hydrogen peroxide solutions	Eary, L. Edmond	Geochemistry and Mineralogy	Geochemistry and Mineralogy	M.S.	1981	Unknown
Mineral textures and parageneses of Kuroko ores from the Uwamuki no.4 and some other Kuroko deposits, Hokuroku District, Japan	Eldridge, Charles Stewart	Geochemistry and Mineralogy	Geochemistry and Mineralogy	M.S.	1981	Ohmoto, Hiroshi
The crystal structure and iron content of wurtzite polytypes-4H, 6H and 15R	Fausey, William Herbert	Geochemistry and Mineralogy	Geochemistry and Mineralogy	M.S.	1981	Smith, D.K.
Geology and tectonic evolution of the southern Beaverhead Range, east-central Idaho	Garmezy, Lawrence	Geology	Geology	M.S.	1981	Scholten, Robert
Geology and geochemistry of tin occurrences in southwestern New Mexico	Goerold, William Thomas	Geology	Geology	M.S.	1981	Rose, A.W.
The effect of water diffusion on the magnetic field in a low-porosity crystalline rock	Haupt, Robert William	Geophysics	Geophysics	M.S.	1981	Martin, Randolph J.
Structural geology of the Resting Spring Range, Inyo County, Death Valley region, eastern California	Heydari, Laibidi E. (Ezatoliah)	Geology	Geology	M.S.	1981	Wright, L.A.
Mineralogy, fluid inclusions, and stable isotopes of lead-zinc occurrences in central Pennsylvania	Howe, Stephen Sherwood	Geochemistry and Mineralogy	Geochemistry and Mineralogy	M.S.	1981	Ohmoto, Hiroshi; Rose, A.W.
Implications of regional gravity and magnetic data for structure beneath western Pennsylvania	Lester, Barry Henry	Geology	Geology	M.S.	1981	Unknown

Optical anisotropy of coals as an indicator of tectonic deformation, Broad Top coal field, Pennsylvania	Levine, J. R. (Jeffrey R.)	Geology	Geology	M.S.	1981	Davis, Alan
Tectonics in Northeastern Iceland: A Remote Sensing and Analysis	Mamulas, Ned	Geology	Geology	M.S.	1981	Unknown
An empirical tensor representation for the stress-dependence of magnetic susceptibility	Ramsey, Robert M.	Geophysics	Geophysics	M.S.	1981	Unknown
Geology at the intersection of the Death Valley and Garlock fault zones, southern Death Valley, California	Stamm, John Francis	Geology	Geology	M.S.	1981	Wright, L.A.
Hydraulic fracturing theory for conditions of thermal stress	Stephens, George	Geology	Geology	M.S.	1981	Unknown
The Effects of Thermally-induced Stresses on the Hydraulic Facturing	Stephens, George	Geology	Geology	M.S.	1981	Unknown
Structure and stratigraphy of the Hayden Creek Area, Lemhi Range, east-central Idaho	Tietbohl, Douglass Ralph	Geology	Geology	M.S.	1981	Scholten, Robert
Oxygen istope fractionation between quartz and magnetite : an experimental determination at 600c° and 5 kb	Touysinhthiphonexay, Yen	Geochemistry and Mineralogy	Geochemistry and Mineralogy	M.S.	1981	Deines, Peter
Thermal expansion of the monoclinic R^2WO^6 rare-earth tungstates (R = Nd, Sm, Gd, Dy)	Tsui Pang B.	Ceramic Science	Earth Science	M.S.	1981	Unknown
Factors controlling the generation of acid mine drainage in bituminous surface coal mines	Waters, Susan Alice	Geology	Geology	M.S.	1981	Williams, E.G.
Seismic body-wave study of verticle and lateral heterogeneity in the earth's interior	Baumgardt, Douglas Reid	Geophysics	Geophysics	Ph.D.	1981	Alexander, Shelton S.
Boiling and mixing of hydrothermal fluids : chemical effects on mineral precipitation	Drummond, Segal Edward	Geochemistry and Mineralogy	Geochemistry and Mineralogy	Ph.D.	1981	Ohmoto, Hiroshi
Mid-Jurassic bryozoans from Wyoming and Utah	Ehleiter, John Edward	Earth Science	Earth Science	Ph.D.	1981	Cuffey, R.J.
Geology and geochronology of the eastern Salmon River Mountains, Idaho, and implications for regional precambrian tectonics	Evans, Karl Vierlng	Geology	Geology	Ph.D.	1981	Scholten, Robert
Experimental and thermodynamic analysis of metamorphic devolatilization equilibria in H^2O-CO^2-CH^4-NaCl fluids at eleveted pressures and temperatures	Jacobs, Gary Kermit	Geochemistry and Mineralogy	Geochemistry and Mineralogy	Ph.D.	1981	Kerrick, Derrill
Transition elements in alkali-aluminosilicate melts : spectroscopy and thermodynamics of glass analogues	Nelson, Carolynn	Geochemistry and Mineralogy	Geochemistry and Mineralogy	Ph.D.	1981	White, W.B.
Source parameter inversion of a reservoir-induced seismic sequence, Lake Kariba, Africa; September 1963-August 1974: a reassessment of triggering mechanisms	Pavlin, Gregory Byron	Geophysics	Geophysics	Ph.D.	1981	Langton, Charles A.
A model for the origin of calc-alkaline andesites at Crater Lake, Oregon	Pinta, James	Geochemistry and Mineralogy	Geochemistry and Mineralogy	Ph.D.	1981	Thornton, C.P.
Relationships between coal constitution, thermoplastic properties and liquefaction behavior of coals and vitrinite concentrates from the Lower Kittaning seam	Senftle, Joseph Thomas	Geology	Geology	Ph.D.	1981	Davis, Alan

The geochemistry and petrography of peats from the Okefenokee Swamp, Georgia, and the Everglades and coastal regions of southern Florida : a study of variable inter-relationships and peat-type differences	Yeakel, Jesse David	Geology	Geology	Ph.D.	1981	Spackman, William
Methane from the northern Gulf Coast geopressured region : a survey of the resource and its potential	Sadlik, Joseph M.	Earth sciences	Earth sciences	B.S.	1982	Unknown
A method of trend surface analysis of a geological structure using elevation and local strike and dip	Salyards, Stephen L.	Geosciences	Geosciences	B.S.	1982	Unknown
Evaporite basins and salt domes : their relationship to plate tectonics and continental drift	Swain, Michael J.	Earth sciences	Earth sciences	B.S.	1982	Unknown
Dipping slab effects on seismic source mechanisms at subduction zones	Arnold, Walter Allen	Geophysics	Geophysics	M.S.	1982	Unknown
Control of Eh and pH to evaluate the rate of pyrite oxidation	Breen, Kevin John	Geochemistry and Mineralogy	Geochemistry and Mineralogy	M.S.	1982	Unknown
A comparative study of the 'Miner' and least squares location techniques as used for the seismic location of trapped coal miners	Christy, Joseph J.	Geophysics	Geophysics	M.S.	1982	Greenfield, Roy
Pollution abatement of landfill leachate by spray irrigation in a northeastern forested Karst terrane	Cohen, Robert Mark	Geology	Geology	M.S.	1982	Parizek, R.R.
Recognition of tin-bearing granites by multivariate statistical analysis, Pikes Peak Batholith, Colorado	Erwin, Leslie Eugene	Geology	Geology	M.S.	1982	Gold, David P.; Griffths, John C.
Modeling of the Koyna, India aftershock of December 12, 1967	Franco, Maria Clara	Geophysics	Geophysics	M.S.	1982	Unknown
Bryozoan reefs in the Middle Silurian of New York and Ontario : fistuliporoid bioherms on the Irondequoit-Rochester boundary in Niagara Gorge	Hewitt, Marshall C.	Geology	Geology	M.S.	1982	Cuffey, R.J.
Petrographic evidence on the paleoclimate and provenance of the Catskill, Pocono, and Pottsville Formations, southeastern Pennsylvania	Hong, Eason	Geology	Geology	M.S.	1982	Williams, E.G.
The formation of sulfides in coastal marine sediments	Mathews, Melissa Jean	Geochemistry and Mineralogy	Geochemistry and Mineralogy	M.S.	1982	Unknown
Evidence for an offset crustal block in the southern Appalachians	Matthews, Leo Gerard	Geophysics	Geophysics	M.S.	1982	Unknown
Factors controlling the frequency of seismic waveforms used in the "Petite Sismique" method of rock mass assessment	Mazza, Thomas A.	Geophysics	Geophysics	M.S.	1982	Unknown
Structure beneath Trinidad using teleseismic P-wave conversions	McBrinn, Geraldine E.	Geophysics	Geophysics	M.S.	1982	Unknown
A reevaluation of Cambrian through Middle Ordovician stratigraphy of the southern Lemhi Range	McCandless, David Oliver	Geology	Geology	M.S.	1982	Scholten, Robert
A remote sensing characterization and comparison of the Semipalatinsk area of the Soviet Union and the geologically analogous Mount Katahdin region of north-central Maine	Sartell, Jonathan Floyd	Geophysics	Geophysics	M.S.	1982	Unknown
Spectroscopic properties of binary and ternary rare earth sulfides and electronic spectra of transition elements in ternary sulfide structures	Schevciw, Oleg	Ceramic Science	Earth Science	M.S.	1982	Unknown

A study of the X-ray diffraction and thermodynamic properties of synthetic, binary nepheline-kalsilite crystalline solutions	Schmidt, Bennetta Lee	Geochemistry and Mineralogy	Geochemistry and Mineralogy	M.S.	1982	Glencoe, James G.
Major element compositions of silicates dissolved in supercritical fluids at mantle conditions : implications for mantle metasomatism	Schneider, Mark E.	Geochemistry and Mineralogy	Geochemistry and Mineralogy	M.S.	1982	Unknown
Crustal structure of south-central Pennsylvania determined from wide-angle reflections and refractions	Sienko, Dennis Alan	Geophysics	Geophysics	M.S.	1982	Unknown
Ultrasonic determination of the elastic properties of single-crystal fayalite, Fe^2SiO^4	Sopkin, Sandra Meryl	Geophysics	Geophysics	M.S.	1982	Unknown
The effect of strip mining on stream morphology and behavior : with emphasis on twenty-nine small watersheds in central Pennsylvania	Touysinhthiphonexay, Kimball C. N.	Geology	Geology	M.S.	1982	Gardner, Thomas W.
Self-potential surveys of a reclaimed coal stripmine, Clearfield County, Pennsylvania	Turner, Kenneth H.	Geophysics	Geophysics	M.S.	1982	Cathles, Lawrence M.
Star sensor assembly sun/earth obscurations	Verdon, Kenneth S.	Engineering Science	Earth Science	M.S.	1982	Unknown
Theoretical, experimental, and field studies concerning the diffusion of aqueous oxidized sulfur species and the diagenesis of anoxic coastal sediments	Applin, Kenneth R.	Geochemistry and Mineralogy	Geochemistry and Mineralogy	Ph.D.	1982	Lasaga, Antonio C.
The dissolution kinetics of anorthite ($CaAl^2Si^2O^8$) and synthetic strontium feldspar ($SrAl^2Si^2O^8$) in aqueous solutions at temperatures below 100 (degrees) C : with applications to the geological disposal of radioactive nuclear wastes	Fleer, Varda Nanette	Geochemistry and Mineralogy	Geochemistry and Mineralogy	Ph.D.	1982	White, W.B.
Multivariate study of the interrelationships among selected variables of the organic fraction of samples of United States' coals	Gerencher, Joseph J.	Earth Science	Earth Science	Ph.D.	1982	Davis, Alan; Griffiths, John C.
The dissolution kinetics of calcite, dolomite, and dolomitic rocks in the CO^2-water system	Herman, Janet Suzanne	Geochemistry and Mineralogy	Geochemistry and Mineralogy	Ph.D.	1982	White, W.B.
The effect of water on high-temperature plastic deformation in olivine	Justice, Mahlon G., Jr.	Geophysics	Geophysics	Ph.D.	1982	Graham, Earl K.; Tressler, Richard E.
The petrographic characterization of coals by automated reflectance microscopy and its application to the prediction of yields in coal liquefaction	Kuehn, Kenneth William	Geology	Geology	Ph.D.	1982	Unknown
"Fossil Lake Danville" : the paleoecology of a Late Triassic ecosystem on the North Carolina-Virginia border	Robbins, Eleanor Iberall	Geology	Geology	Ph.D.	1982	Traverse, A.F.
Factors controlling the kinetics of silicate-water interactions	Tole, Mwakio Peter	Geochemistry and Mineralogy	Geochemistry and Mineralogy	Ph.D.	1982	Lasaga, Antonio C.
Thermal history, chemical and isotopic compositions of the ore-forming fluids responsible for the Kuroko massive sulfide deposits in the Hokuroko district of Japan	Visut, Pisutha-Arnond	Geochemistry and Mineralogy	Geochemistry and Mineralogy	Ph.D.	1982	Ohmoto, Hiroshi
Investigation of seismic precursors before major earthquakes and of the state of stress on fault planes	Von Seggern, David Henry	Geophysics	Geophysics	Ph.D.	1982	Alexander, Shelton S.

Gully development in Northwestern New Mexico	Ritter, John B.	Geosciences	Geosciences	B.S.	1983	Unknown
An investigation into geopressured-geothermal energy production in the Gulf Coast region	Zwinak, Elizabeth A.	Geology	Geology	B.S.	1983	Unknown
The quaternary geology of the West Branch of the Susquehanna River Valley near Lock Haven, Pennsylvania	Baxter, James Edwards	Geology	Geology	M.S.	1983	Gardner, Thomas W.
Controls of base-metal deposits, the Little Eightmile and northern Gilmore Mining Districts, Lemhi County, Idaho	Brachman, Steven H.	Geology	Geology	M.S.	1983	Unknown
The Nature of Acadian plutonism in northern New England	Chacko, Thomas	Geochemistry and Mineralogy	Geochemistry and Mineralogy	M.S.	1983	Unknown
Distributions and ecology of encrusting-cheilostome bryozoans of Enewetak Atoll	Cox, Robert Sayre	Geology	Geology	M.S.	1983	Cuffey, R.J.
Bryozoans of the modern Wallops-Chincoteague coast, Virginia	Dade, William Brian	Geology	Geology	M.S.	1983	Cuffey, R.J.
Soil characterization, headcut erosion and landsat classification in the San Juan Basin	Duffy, William Joseph	Geology	Geology	M.S.	1983	Unknown
Primary consolidation and subsidence in transgressive barrier island systems	Gayes, Paul Thomas	Geology	Geology	M.S.	1983	Slingerland, Rudy
Fluoride saturation levels in groundwater : applications for tin exploration	Giammarco, Joseph H.	Geochemistry and Mineralogy	Geochemistry and Mineralogy	M.S.	1983	Unknown
An analysis of fluid-rock interactions at the Ely porphyry copper deposit by utilization of fluid inclusions	Goss, Brian Glen	Geochemistry and Mineralogy	Geochemistry and Mineralogy	M.S.	1983	Unknown
Structure and stratigraphy of the Lemhi Pass area, Beaverhead Range, southwest Montana and east-central Idaho	Hansen, Peter Michael	Geology	Geology	M.S.	1983	Scholten, Robert
Crustal thickness estimate at AAE (Addis-Ababa, Ethiopa) and NAI (Nairobi, Kenya) using teleseismic P-wave conversions	Hebert, Louis	Geophysics	Geophysics	M.S.	1983	Unknown
Two electrical problems with cylindrical symmetry : (I) The interpretation of the IP data taken near a steel casing (II) The interpretation of resistivity data taken in an underground tunnel	Henry, Hollis E.	Geophysics	Geophysics	M.S.	1983	Unknown
Petrology and stratigraphy of a part of the Central Death Valley Volcanic Field, eastern California	Hu, Nien-Tsu Alfred	Geology	Geology	M.S.	1983	Wright, Lauren A.
The effect of assumed source structure on inversion for earthquake source parameters : the eastern Hispaniola earthquake of 14 September 1981	Johnston, David Earle	Geophysics	Geophysics	M.S.	1983	Unknown
A preliminary gravity study of the Guanacaste and Nicoya peninsula regions of Costa Rica	Kimler, Scott Thomas	Geophysics	Geophysics	M.S.	1983	Unknown
Sulfur isotopic evidence for country rock contamination of granitoids in southwestern Nova Scotia	Kubilius, Walter Paris	Geochemistry and Mineralogy	Geochemistry and Mineralogy	M.S.	1983	Unknown
The geology of the Osa Peninsla, Costa Rica : observations and speculations about the evolution of part of the outer arc of the southern Central American Orogen	Lew, Laurence R.	Geology	Geology	M.S.	1983	Scholten, Robert

Fertile organs and in situ spores of ferns from the late Triassic Chinle Formation of the Colorado Plateau (Arizona and New Mexico) : with discussion of the associated dispersed spores	Litwin, Ronald J.	Geology	Geology	M.S.	1983	Traverse, Alfred
An investigation of two thermal models of oceanic lithosphere based on topography, heat flow, and shear wave travel time residuals	MacLeod, Anne Jacquelyn	Geophysics	Geophysics	M.S.	1983	Unknown
Drift aquifer geometry and interconnection defined by numerical simulation	Matters, Seth	Geology	Geology	M.S.	1983	Parizek, R.R.
The Proterozoic Gunsight Formation, Idaho-Montana : stratigraphy, sedimentology and paleotectonic setting	McBean, Alan Johnston	Geology	Geology	M.S.	1983	Scholten, Robert
Water-saturated and -undersaturated phase relations of the Mount St. Helens dacite magma erupted on May 18, 1980 : and an estimate of the pre-eruptive water content	Merzbacher, Celia I.	Geochemistry and Mineralogy	Geochemistry and Mineralogy	M.S.	1983	Unknown
Dissolution kinetics of Spinel: $NiFe_2O_4$ and $NiAl_2O_4$	Nachlas, Jesse Alan	Geochemistry	Geochemistry	M.S.	1983	Unknown
Combined use of wavenumber analysis of landsat digital imagery and seismic data to infer the orientation of tectonic stress in the Hoggar region in Africa	Ng, Carolyn Yee-han	Geophysics	Geophysics	M.S.	1983	Alexander, Shelton S.
Implementation of a frequency-domain phase-difference polarization filter and its application to a determination of crustal structure in parts of eastern North America	O'Neill, Dennis Charles	Geophysics	Geophysics	M.S.	1983	Unknown
Major crustal lineaments and the Rome trough in West Virginia	Rice, Benjamin J.	Geophysics	Geophysics	M.S.	1983	Unknown
Crustal block tectonics : application to the Lake Erie-Maryland "block" in eastern United States	Rosencrans, Richard D.	Geophysics	Geophysics	M.S.	1983	Unknown
Effect of fracture permeability on radon-222 concentration in ground water of the Reading Prong, Pennsylvania	Rumbaugh, James O.	Geology	Geology	M.S.	1983	Parizek, R.R.
Ultrasonic determination of the elastic properties of fayalite as a function of pressure and temperature	Schwab, Jean Ann	Geophysics	Geophysics	M.S.	1983	Unknown
The suppression of multiple reflection energy on vertical seismic profiles	Shoemaker, James Scovell	Geophysics	Geophysics	M.S.	1983	Unknown
Gas reserves in the Medina Group of northwestern Pennsylvania as related to fracture porosity and stratigraphic control	Star, Ira	Geology	Geology	M.S.	1983	Gold, David P.
The use of the scanning electron microscope to observe conductivity phenomena in selected rocks	Streb, Lawrence Lambert	Geophysics	Geophysics	M.S.	1983	Unknown
A glacial geology workbook for ninth grade students	Tanner, Candace Beck	Earth Science	Earth Science	M.S.	1983	Unknown
Ages of uranium mineralization and lead in the Key Lake Deposit, northern Saskatchewan, Canada	Trocki, Linda Katherine	Geochemistry and Mineralogy	Geochemistry and Mineralogy	M.S.	1983	Unknown
Ages of uranium mineralization and lead toss in the Key Lake deposit, Northern Saskatchewan, Canada	Trocki, Linda Katherine	Geochemistry	Geochemistry	M.S.	1983	Unknown

The solubility of Al^2SiO^5 in the system $KAlSi^3O^8$-SiO^2-H^2O at 2 Kbar, and its implications for melt speciation	Voigt, Donald Edward	Geochemistry and Mineralogy	Geochemistry and Mineralogy	M.S.	1983	Unknown
Turbulent boundary layer interpretation of sand streaks and parting lineation	Weedman, Suzanne Dallas	Geology	Geology	M.S.	1983	Slingerland, Rudy
Fracture zone deformation of a tertiary lava pile, north-central Iceland	Young, Kirby David	Geology	Geology	M.S.	1983	Voight, Barry
The petrology of a quartz monzonite pluton in the southern Greenwater Range, Inyo County, California	Almashoor, Syed S.	Geochemistry and Mineralogy	Geochemistry and Mineralogy	Ph.D.	1983	Thornton, C.P.
The fluid- and chemical-dynamics of base-metal sulfide recovery from geothermal systems	Arthur, Randolph Clyde	Geochemistry and Mineralogy	Geochemistry and Mineralogy	Ph.D.	1983	Barnes, H.L.
Computation of the shear-coupled PL wave	Baag, Chang-Eob	Geophysics	Geophysics	Ph.D.	1983	Langston, Charles A.
The petrology, palynology and stratigraphy of the coastal wetland peat deposits at Black River, St. Elizabeth, Jamaica	Bertrand, Rollin Clifton	Petrology	Petrology	Ph.D.	1983	Unknown
Stabilities of chloride and bisulfide complexes of zinc in hydrothermal solutions	Bourcier, William L.	Geochemistry and Mineralogy	Geochemistry and Mineralogy	Ph.D.	1983	Barnes, H.L.
Pyrrhotite solubility in hydrous albite melts	Bradbury, John W.	Geochemistry and Mineralogy	Geochemistry and Mineralogy	Ph.D.	1983	Burnham, C.W.
Stratigraphy, geochronology and structure of the selected areas of the northern Death Valley region, eastern California - western Nevada : and implications concerning Cenozoic tectonics of the region	Cemen, Ibrahim	Geology	Geology	Ph.D.	1983	Wright, L.A.
Paleopalynology of the Upper Cretaceous-Paleogene Eureka Sound Formation of Ellesmere and Axel Heiberg Islands, Canadian Arctic Archipelago	Choi, Duck Keun	Geology	Geology	Ph.D.	1983	Traverse, Alfred
Chemical diffusion and dielectric polarization processes in silicate minerals	Cygan, Randall Timothy	Geochemistry and Mineralogy	Geochemistry and Mineralogy	Ph.D.	1983	Lasaga, Antonio C.
Experimental and theoretical study of mass flow and reaction for the leaching of sandstone uranium ores	Eary, L. Edmond	Geochemistry and Mineralogy	Geochemistry and Mineralogy	Ph.D.	1983	Barnes, H.L.
Geology and geochronology of the southeast border of the Bitterroot dome : implications for the structural evolution of the mylonitic carapace	Garmezy, Lawrence	Geology	Geology	Ph.D.	1983	Scholten, Robert
Characterization of the organic structure of the Lower Kittanning coal seam using Fourier transform infrared spectroscopy and optical properties	Kuehn, D. W. (Deborah Wilbur)	Geology	Geology	Ph.D.	1983	Davis, Alan
A three-dimensional ray method and its application to the study of wave propagation in crystal structure with curved layers	Lee, Jia Ju	Geophysics	Geophysics	Ph.D.	1983	Langton, Charles A.
Tectonic history of coal-bearing sediments in eastern Pennsylvania using coal reflectance anisotropy	Levine, J. R. (Jeffrey R.)	Geology	Geology	Ph.D.	1983	Davis, Alan
Stratigraphy, petrography and depositional environments of the carbonate-terrigenous member of the Crystal Spring Formation, Death Valley, California	Maud, Randall L.	Geology	Geology	Ph.D.	1983	Wright, L.A.; Williams, E.G.

Determination of fault-related stress changes using the piezomagnetic effect	Narbut, Susan Margaret	Geophysics	Geophysics	Ph.D.	1983	Martin, Randolph J.
Relationships between Pennsylvanian-age sandstone and mudrock diagenesis and coal rank in the central Appalachians	Paxton, Stanley Turner	Geology	Geology	Ph.D.	1983	Williams, Eugene G.
Petrography and depositional environment of the Herrin (No. 6) seam in central, eastern and northwestern Illinois	Russell, Suzanne Jeannette	Geology	Geology	Ph.D.	1983	Davis, Alan
Geology of redbed Cu-U occurrences in the Upper Devonian Catskill Fm., Pennsylvania	Smith, Arthur Tremaine	Geology	Geology	Ph.D.	1983	Rose, A.W.
Mathematical modelling of longitudinal profile adjustment in alluvial streams	Snow, Robin Scott	Geology	Geology	Ph.D.	1983	Slingerland, Rudy
The depositional environments and petrography of the Stirling Quartzite, Death Valley region, California and Nevada	Wertz, William Earl	Geology	Geology	Ph.D.	1983	Wright, L.A.; Williams, E.G.
The structures and crystal chemistry of the autunite and meta-autunite mineral groups	Zolensky, M. E. (Michael E.)	Geochemistry and Mineralogy	Geochemistry and Mineralogy	Ph.D.	1983	Smith, D.K.
A field study of alluvial terraces along a portion of Bald Eagle and Spring Creeks in Centre County, Pa	Kashatus, Gerard P.	Earth Science	Earth Science	B.S.	1984	Unknown
Literature review and synesis for the depositional environments of the Lower Kittanning Seam, Western Pennsylvania.	Sacolic, Brian	Geology	Geology	B.S.	1984	Unknown
Petrographic variation due to depositional setting of the Lower Kittanning seam, western Pennsylvania	Allshouse, Sharon Dale	Geology	Geology	M.S.	1984	Davis, Alan
Detection of subsurface cavities by electrical resistivity : with a field study at Miller Cave, PA	Blackey, Mark E.	Geophysics	Geophysics	M.S.	1984	Unknown
Source mechanism of the May 18, 1980 St. Helens eruption from regional surface waves	Burger, Roy W.	Geophysics	Geophysics	M.S.	1984	Unknown
Trace metal solubility in South Texas oil field brine with implications for Mississippi Valley-type ore deposits	Glazier, Robert M.	Geochemistry and Mineralogy	Geochemistry and Mineralogy	M.S.	1984	Unknown
Variability in the inorganic content of United States' coals : a multivariate statistical study	Glick, David C.	Geology	Geology	M.S.	1984	Davis, Alan
Geomorphic surfaces and vertical neotectonism of the Nicoya Peninsula, northwestern Costa Rica	Hare, Paul W.	Geology	Geology	M.S.	1984	Gardner, Thomas
Hydrothermal experiments on the andalusite-sillimanite equillibrium	Heninger, Steven G.	Geochemistry and Mineralogy	Geochemistry and Mineralogy	M.S.	1984	Unknown
Ultrasonic measurements of the elastic properties of single-crystal magnesium aluminate spinel, $Mg\,Al^{2}\,O^{4}$	Hilbert, Eric George	Geophysics	Geophysics	M.S.	1984	Unknown
A study of the convection pattern in a laterally homogeneous, compressible mantle with heat sources and the corresponding temperature profiles in the mantle	Ho, Phyllis Hang-Yin	Geophysics	Geophysics	M.S.	1984	Unknown

Geology and exploration geochemistry of the Big Creek and Kingston Canyon areas, Toiyabe Range, Lander County, Nevada	Kuehn, Carl A.	Geology	Geology	M.S.	1984	Davis, Alan
Areal distribution and strontium contents of anhydrites peripheral to Kuroko massive sulfide deposits in Japan and their implications for hydrothermal fluid circulation	Lenagh, Thomas Coultar	Geochemistry and Mineralogy	Geochemistry and Mineralogy	M.S.	1984	Ohmoto, Hiroshi
A modified cepstral method and its application to DWWSSN broadband data	Liaw, Zen-Sen	Geophysics	Geophysics	M.S.	1984	Unknown
Geologic and rheologic characteristics of the May 18, 1980 southwest flank lahars at Mount St. Helens, Washington	Major, Jon J.	Geology	Geology	M.S.	1984	Voight, Barry
Stratigraphy, structure, and metamorphism of Permo-Triassic rocks along the western margin of the Idaho batholith, John Day Creek, Idaho	McCollough, William F.	Geology	Geology	M.S.	1984	Scholten, Robert
Application of groundwater geochemistry as an exploration tool for carbonate-hosted zinc-lead deposits in Pennsylvania	McNally, Joseph Thomas	Geochemistry and Mineralogy	Geochemistry and Mineralogy	M.S.	1984	Unknown
Ultrasonic determination of the elastic properties of aluminum oxynitride spinel (ALON) as a function of pressure and temperature	Munly, Walter C.	Geophysics	Geophysics	M.S.	1984	Unknown
Analysis of the New Brunswick, 1982, earthquake sequence with inferences on source parameters from multi-mode surface wave dispersion and spectral excitation	Nichols, Christine C.	Geophysics	Geophysics	M.S.	1984	Unknown
Seismotectonics of southeastern New York State	Ossman, Robert Mark	Geophysics	Geophysics	M.S.	1984	Unknown
Trends in metal ratios as a function ore type and stratigraphic position in the Kuroko deposits, Japan	Pavelka, Anne	Geochemistry and Mineralogy	Geochemistry and Mineralogy	M.S.	1984	Ohmoto, Hiroshi
Stratigraphy, sedimentology, and petrography of the Lower Cambrian Zabriskie Quartzite in the Death Valley region, southeastern California and southwestern Nevada	Prave, Anthony Robert	Geology	Geology	M.S.	1984	Wright, L.A.
Spinel-silicate equilibria in the system MgO-FeO-Fe^2O^3-$A1^2O^3$-Cr^2O^3- SiO^2 and comparisons with mafic igneous rocks	Schwessinger, William T.	Geochemistry and Mineralogy	Geochemistry and Mineralogy	M.S.	1984	Unknown
Experimental kinetic study of the reaction : calcite + quartz [yield] wollastonite + carbon dioxide, from 1 to 3 kilobars and 500 Ċ to 850 Ċ	Tanner, Stephen Bruce Snowden	Geochemistry and Mineralogy	Geochemistry and Mineralogy	M.S.	1984	Unknown
Earthquake doublets and mixed magnitude populations in earthquake prediction	Waters, Roger Kenneth	Geophysics	Geophysics	M.S.	1984	Howell Jr., Benjamin
The Role of Tellurium in Hydrothermal Gold Transport	Werner, Sarah Ross	Geochemistry and Mineralogy	Geochemistry and Mineralogy	M.S.	1984	Unknown
A seismological analysis of the May 1980 Mammoth Lakes, California earthquakes	Barker, Jeffrey Scott	Geophysics	Geophysics	Ph.D.	1984	Langston, Charles
A numerical model of groundwater flow associated with an underground coal mine in the Appalachian Plateau, Pennsylvania	Booth, Colin John	Geology	Geology	Ph.D.	1984	Parizek, Richard
A sulfur isotopic, ore textural, chemical, and experimental study on the formation of the Kuroko deposits, Hokuroku district, Japan	Eldridge, Charles Stewart	Geochemistry and Mineralogy	Geochemistry and Mineralogy	Ph.D.	1984	Lundegren, Herberta M.

A wind-tunnel study of the saltation of heterogeneous (size, density) sands	Gerety, Kathleen Mary	Geology	Geology	Ph.D.	1984	Slingerland, Rudy
The organic geochemistry of three Mississippi Valley-Type ore deposits	Gize, Andrew Paul	Geochemistry and Mineralogy	Geochemistry and Mineralogy	Ph.D.	1984	Barnes, H.L.
Subsurface imaging with ground-penetrating radar	Houck, Richard Thomas	Geophysics	Geophysics	Ph.D.	1984	Alexander, Shelton
Thermodynamic analysis of some equilibria in the system MgO-SiO^2-H^2O	Krupka, Kenneth Michael	Geochemistry and Mineralogy	Geochemistry and Mineralogy	Ph.D.	1984	Kerrick, Derrill
Tectonic history of a continent - island arc boundary : west-central Idaho	Lund, Karen	Geology	Geology	Ph.D.	1984	Scholten, Robert
Kinetics of aqueous oxidation of pyrite by ferric iron, oxygen, and hydrogen peroxide from pH 1-4 and 20-40°C	McKibben, Michael Andersen	Geochemistry and Mineralogy	Geochemistry and Mineralogy	Ph.D.	1984	Barnes, Hubert L.
Thermodynamic mixing properties of binary analbite-sanidine feldspars	Merkel, Gregory Albert	Geochemistry and Mineralogy	Geochemistry and Mineralogy	Ph.D.	1984	Blenceo, James G.
The formation and growth of pyrite, marcasite, and cubic FeS	Murowchick, James Bernard	Geochemistry and Mineralogy	Geochemistry and Mineralogy	Ph.D.	1984	Barnes, H.L.
The kinetics of metamorphic hydration-dehydration reactions	Schramke, Janet A.	Geochemistry and Mineralogy	Geochemistry and Mineralogy	Ph.D.	1984	Kerrick, Derrill M.
Geochemistry of tungsten in scheelite deposits : the skarn ores at King Island, Tasmania	Wesolowski, David	Geochemistry and Mineralogy	Geochemistry and Mineralogy	Ph.D.	1984	Ohmoto, Hiroshi
Determination of lattice constants and magnetic properties for rare earth-iron-borides	Griffith, William E.	Ceramic Science and Engineering	Earth Science	B.S.	1985	Unknown
Hydrogeology and radionuclide adsorption as factors in low level radioactive waste disposal site selection in Pennsylvania	Kohl, Dagmar	Geosciences	Geosciences	B.S.	1985	Unknown
Occurrences and origin of heavy mineral placers in braided stream facies of the Agujas River, Osa Peninsula, Costa Rica	Azuola Valls, Hannia	Geology	Geology	M.S.	1985	Slingerland, Rudy
Testing and implementation of a phase-difference polarization filter and application of cepstral analysis to enhance regional seismic phases	Borkowski, Annette Hottman	Geophysics	Geophysics	M.S.	1985	Unknown
Enhancement and detection of linear features with application to the Appalachian region	Burch, Charles Ivan	Geophysics	Geophysics	M.S.	1985	Unknown
Simulated SPOT imagery for the investigation of geomorphic features and hydrologic processes	Connors, Kathryn Frances	Geology	Geology	M.S.	1985	Gardner, Thomas
A comparison of theoretical rock models with laboratory data, and applications to geophysical hydrocarbon exploration	Dhaliwal, Hardave	Geophysics	Geophysics	M.S.	1985	Graham, Earl
The geochemistry of oilfield brines from western Pennsylvania	Dresel, P. Evan	Geochemistry and Mineralogy	Geochemistry and Mineralogy	M.S.	1985	Rose, Arthur
Intervention Analysis Applied to the quantity and quality of Drainage from Abandoned Underground Coal Mine in North Central Pennsylvania.	Duffield, Glenn M.	Geology	Geology	M.S.	1985	Parizek, Richard
Elastic models of Krafla volcano, north Iceland: 1976-1982	Ewart, James Alfred	Geology	Geology	M.S.	1985	Unknown
The hydrogeological response to continental glaciation	Filley, Thomas Howard	Geology	Geology	M.S.	1985	Parizek, Richard

Trace element partitioning between a silicate melt and a super-critical hydrous fluid : implications for mantle metasomatiasm	Fregeau, Elizabeth Jean	Geochemistry and Mineralogy	Geochemistry and Mineralogy	M.S.	1985	Unknown
Application of resistivity inversion method to map shallow earth structures	Galadanchi, Habeeb I.	Geophysics	Geophysics	M.S.	1985	Unknown
Hydrogeologic characterization of a surface mining-impacted watershed with implications for acid mine drainage abatement, Clarion County, Pennsylvania	Henke, Jeffrey R.	Geology	Geology	M.S.	1985	Parizek, Richard
The Yenice-Gonen earthquake of 1953 and some examples of recent tectonic events in the Biga Peninsula of northwest Turkey	Herece, Erdal Ibrahim	Geology	Geology	M.S.	1985	Gold, David P.
Delineation of acid mine drainage potential of coal-bearing strata of the Pottsville and Allegheny Groups in western Pennsylvania	Hornberger, Roger J.	Geology	Geology	M.S.	1985	Parizek, Richard
Hydrology of surface-mined land : a determination of minesoil control on infiltration capacity, and runoff modeling of disturbed watersheds	Jorgensen, David Wayne	Geology	Geology	M.S.	1985	Gardner, Thomas
The effects of aquifer dewatering on two ephemeral streams in southwestern San Juan Basin, New Mexico	Mills, Alison M.	Geology	Geology	M.S.	1985	Gardner, Thomas
Three-dimensional ray tracing in the determination of local source structure effects on teleseismic p-waves from buried explosions : application to Yucca Flat, Nevada	Mirkin, Adam N.	Geophysics	Geophysics	M.S.	1985	Unknown
Regional Joint evolution and paleothermometry-barometry from fluid inclusions in the Valley and Ridge Province of Pennsylvania in rlation to the Alleghany Orogeny.	Orkan, Nebil I.	Geology	Geology	M.S.	1985	Unknown
Stratigraphy and depositional environments of a Neogene playa-lake system, China Ranch beds, near Death Valley, California	Scott, Robert Karl	Geology	Geology	M.S.	1985	Wright, Lauren
A theoretical study of the method of amplitude variation with offset for offshore Cameroon seismic exploration	Seme-Abomo, Richard	Geophysics	Geophysics	M.S.	1985	Unknown
Gold solubility in aqueous sulfide solutions	Shenberger, David M.	Geochemistry and Mineralogy	Geochemistry and Mineralogy	M.S.	1985	Unknown
Calcite precipitation and thermal evolution of the Cerro Prieto geothermal system : a fluid inclusion and stable isotope study	Sterner, Steven Michael	Geochemistry and Mineralogy	Geochemistry and Mineralogy	M.S.	1985	Unknown
A microscopic investigation of the fate of secondary xylem during peatification and the early stages of coal formation	Stout, Scott Alan	Geology	Geology	M.S.	1985	Spackman, William
Source mechanisM.S.tudy of the 1982 New Brunswick earthquake sequence using a phase-matched-filtering method and a surface wave spectral-amplitude-ratio method	Yan, Ben	Geophysics	Geophysics	M.S.	1985	Unknown
Source mechanism study of the 1982 New Brunswick earthquake sequence using a phase-matched-filtering method and a surface wave spectral-amplitude-ratio method	Yan, Ben	Geophysics	Geophysics	M.S.	1985	Unknown
Paleoecology of Permian bryozoan bioherms in the Glass Mountains, west Texas	Zimmerman, Laurie S.	Geology	Geology	M.S.	1985	Cuffey, Roger J.

The compositions of melts coexisting with plagioclase, olivine, augite, orthopyroxene, and pigeonite at pressures from one atmosphere to 20 kbar and application to petrogenesis in intraoceanic island arcs	Baker, Don R.	Geochemistry and Mineralogy	Geochemistry and Mineralogy	Ph.D.	1985	Eggler, David H.
Pressure-volume-temperature-composition (PVTX) properties of the system H^20-NaC1 at elevated temperatures and pressures	Bodnar, Robert John	Geochemistry and Mineralogy	Geochemistry and Mineralogy	Ph.D.	1985	Unknown
Solute transport and models for sulfate reduction and radionuclide migration in marsh sediment	Casey, William Howard	Geochemistry and Mineralogy	Geochemistry and Mineralogy	Ph.D.	1985	Barnes, Hubert L. ; Lasaga, Antonio C.
The geology of the Santa Elena Peninsula, Costa Rica, and its implications for the tectonic evolution of the Central-America-Caribbean region	Lew, Laurence R.	Geology	Geology	Ph.D.	1985	Scholten, Robert
Kinetics of aqueous oxidation of pyrite by ferric iron, oxygen, and hydrogen peroxide from pH 1-4 and 20-40C°	McKibbin, Michael A.	Geochemistry and mineralogy.	Geochemistry and mineralogy.	Ph.D.	1985	Barnes, Hubert L.
The origin and evolution of a continental volcano -- Independence, Montana	Meen, James K.	Geochemistry and Mineralogy	Geochemistry and Mineralogy	Ph.D.	1985	Eggler, David H.
Igneous plagioclase feldspar : kinetics of crystal growth and the origin of complex compositional Zoning	Muncill, Gregory Ernest	Geochemistry and Mineralogy	Geochemistry and Mineralogy	Ph.D.	1985	Unknown
The Use of Geophysical Geobotonical and Remotely Sensed Data in a Low-Cost Hydrocarbon Exploration Strategy for the Appalachians	Parrish, Jay B.	Geophysics	Geophysics	Ph.D.	1985	Alexander, Shelton
Lateral and Vertical Variability in Petrography and Mineralogy of the Lower Kittanning Seam. Western Pennsylvania and Eastern Ohio	Rimmer, Susan Margaret	Geology	Geology	Ph.D.	1985	Davis Alan
An introduction to remote sensing with a land use and land cover classification model	Diehl, Mark W.	Earth sciences	Earth sciences	B.S.	1986	Gold, David P.
Helium-4 and radon-222 concentrations in groundwater and soil gas as indicators of the extent and depth of fracture concentration in rock	Banwell, Gail Marie	Geology	Geology	M.S.	1986	Parizek, Richard
Adsorption of Ag, Co, Cu, Ni, Pb, and Zn on geothite	Bianchi-Mosquera, Gino Cesar	Geochemistry and Mineralogy	Geochemistry and Mineralogy	M.S.	1986	Unknown
Origin and paleoenvironmental significance of soft-sediment deformation structures in the Upper Cretaceous Parkman Sandstone, northwest Wyoming, and neogene sediments, Mal Pais, Costa Rica	Blakeney, Beverly A.	Geology	Geology	M.S.	1986	Slingerland, Rudy
Spatial and temporal variations of ground-water chemistry in the vicinity of carbonate-hosted zinc-lead occurrences, sinking valley, Blair County, Pennsylvania	Cravotta, Charles Angelo	Geochemistry and Mineralogy	Geochemistry and Mineralogy	M.S.	1986	Unknown
The petrography and petrology of granitic and related rocks near Griffin, Georgia	Curatolo, Joel Charles	Geology	Geology	M.S.	1986	Thornton, Charles
Geochemical and mineralogical exploration for Galkin-type talc deposits, Vermont	Dodd, Kurt A.	Geochemistry and Mineralogy	Geochemistry and Mineralogy	M.S.	1986	Unknown
An ultrasonic determination of the elastic properties of single-crystal manganosite, MnO	Gerald, Rosemary Elaine	Geophysics	Geophysics	M.S.	1986	Unknown

Thermal controls on lithospheric strength and the evolution of the northern San Andreas fault system	Hugo, William D.	Geophysics	Geophysics	M.S.	1986	Unknown
Fluvial terraces of the Juniata River Valley in Central Pennsylvania	Kaktins, Teresa L.	Geology	Geology	M.S.	1986	Gardner, Thomas
Calculating constrained crustal geotherms	Kovarik, Mary Beth	Geophysics	Geophysics	M.S.	1986	Unknown
Marine depositional environments in the Lower Silurian of east Tennessee and adjacent areas	McAuliffe, James Michael	Geology	Geology	M.S.	1986	Guber, Albert
Petrographic, fluid inclusion, and stable isotope studies of the Red Hill Cu-Mo-Au Prospects, Ord Mountain, California	Mikucki, Edward	Geochemistry and Mineralogy	Geochemistry and Mineralogy	M.S.	1986	Unknown
Upper mantle P-velocity structure between eastern North America and Hispaniola	Niemann, Nancy L.	Geophysics	Geophysics	M.S.	1986	Unknown
Equilibrium measurements with a bearing on the distribution of nickel between crystalline and liquid phases in silicate systems	Pretorius, Eugene B.	Geochemistry and Mineralogy	Geochemistry and Mineralogy	M.S.	1986	Unknown
Evaluating ground-water recharge potential in the valley and ridge region of the central Appalachians using a digital-overlay technique	Smith, Michael William	Geology	Geology	M.S.	1986	Parizek, Richard
Fold-fault complexes in the Appalachian bend between Spruce Creek and Williamsburg, Pennsylvania	Steele, Sarah Ellen	Geology	Geology	M.S.	1986	Scholten, Robert
Contemporary tectonics of the Lancaster, Pennsylvania seismic zones	Stockar, David V.	Geophysics	Geophysics	M.S.	1986	Alexander, Shelton
Interpretation of large-scale cross-strata in a borehole : a computer simulation model	Taylor, Terry Dean	Geology	Geology	M.S.	1986	Slingerland, Rudy
The Meckering earthquake of October 14, 1968 : a possible downward propagating rupture	Vogfjörd, Kristín S.	Geophysics	Geophysics	M.S.	1986	Langston, Charles
Waveform inversion for five African earthquakes and tectonic implications for continental deformation	Wagner, Gregory S.	Geophysics	Geophysics	M.S.	1986	Langston, Charles
Thermal regimes of small basins : an investigation of the effects of intrabasinal conductive and advective heat transport	Weir, L. Alison	Geophysics	Geophysics	M.S.	1986	Furlong, Kevin
Mineralogic, fluid inclusion, and stable isotope studies of several gold mines in the Mother Lode, Tuolumne and Mariposa Counties, California	Weir, Robert H.	Geochemistry and Mineralogy	Geochemistry and Mineralogy	M.S.	1986	Kerrick, Derrill M.
Wave propagation effects observed in aftershock waveforms of the January 9, 1982 Miramichi, New Brunswick earthquake	Williams, David E.	Geophysics	Geophysics	M.S.	1986	Unknown
Dissolution kinetics of crystalline and amorphous albite	Zellmer, Lauren Ann	Geochemistry and Mineralogy	Geochemistry and Mineralogy	M.S.	1986	Unknown
Evaluation of the Connector Well Roof Dewatering Method in the Abatement of Acidic Mine Drainage from the Arnot No.2 Mine, Tioga County, PA.	Buss, David Roger	Geology	Geology	Ph.D.	1986	Parizek, Richard
Paleopalynological biostratigraphy, organic matter deposition, and basin analysis of the Triassic-(?) Jurassic Richmond rift basin, Virginia, U.S.A	Ediger, Volkan S.	Geology	Geology	Ph.D.	1986	Traverse, Albert

A method for modeling the Earth's mantle using compositional and seismological constraints	Justice, Pamela R.	Geophysics	Geophysics	Ph.D.	1986	Graham, Earl K.
The palynostratigraphy and age of the Chinle and Moenave Formations, Southwestern U.S.A	Litwin, Ronald J.	Geology	Geology	Ph.D.	1986	Traverse, Alfred
A theoretical thermodynamic investigation of the system Ab-Or-An-Qz(-H^2O) and implications for melt speciation	Nekvasil, Hanna	Geochemistry and Mineralogy	Geochemistry and Mineralogy	Ph.D.	1986	Unknown
Solubility of cassiterite (SnO:2) in NaC1 solutions from 200 Ċ - 350 Ċ, with geologic applications	Pabalan, Roberto Tuason	Geochemistry, Mineralogy	Geochemistry	Ph.D.	1986	Unknown
An interpretation of late Cretaceous sedimentation and tectonics and the nature of Pyrenean deformation in the northwestern Basque Pyrenees	Prave, Anthony Robert	Geology	Geology	Ph.D.	1986	Scholten, Robert
Interpretation and modeling of regional crustal structure of the southeastern United States using raw and filtered conventional and satellite gravity and magnetic data	Ruder, Michal Ellen	Geophysics	Geophysics	Ph.D.	1986	Alexander, Shelton
Aspects of regional short-period wave propagation : a study of the December 1967 Koyna earthquakes, Maharashtra, India	Alves, David J.	Geophysics	Geophysics	M.S.	1987	Langston, Charles
Fracture analysis of the northern end of the Leinster granite	Barry, John P.	Geology	Geology	M.S.	1987	Voight, Barry
Engineering geologic parameters and their relationship to roof falls in a coal mine on the Appalachian Plateau, Pennsylvania	Blackmer, Gale Corless	Geology	Geology	M.S.	1987	Gold, David P.
Sulfur isotope study of sulfide-sulfate chimneys on the East Pacific Rise, 11 and 13 Ñ latitudes	Bluth, Gregg J.	Geochemistry and Mineralogy	Geochemistry and Mineralogy	M.S.	1987	Kump, Lee
A geochemical and structural study of the South Mountain Batholith of Southern Nova Scotia for tin and uranium mineralization	Brickey, David Wayne	Geology	Geology	M.S.	1987	Gold, David P.
The mechanics of subduction zone topography : a study of age effect in the Pacific Northwest	Crum, Steven V.	Geophysics	Geophysics	M.S.	1987	Unknown
Economic geology of the Middle Ordovician dolomites and limestones at the Narehood Quarry, Blair and Huntington Counties, Central Pennsylvania	Grenot, Charles H.	Geology	Geology	M.S.	1987	Wright, Lauren
Radon variability in soil gas over fracture traces	Hutter, Adam Richard	Geochemistry and Mineralogy	Geochemistry and Mineralogy	M.S.	1987	Rose, Author
The Adsorption of Water Vapor onto Quartz Surfaces at Elevated Temperatures and Pressures	Jarrin, Keith M.	Geochemistry.	Geochemistry.	M.S.	1987	Unknown
A phase equilibriuM.S.tudy in the system $NaAlSi^3O^8$-SiO^2-Al^2SiO^5-H^2O at 2 kilobars and petrogenetic implications	Joyce, David Brian	Geochemistry and Mineralogy	Geochemistry and Mineralogy	M.S.	1987	Unknown
A phase equilibrium study in the system $NaAlSi^3O^8$-SiO^2-Al^2SiO^5-H^2O at 2 kilobars and petrogenetic implications	Joyce, David Brian	Geochemistry and Mineralogy	Geochemistry and Mineralogy	M.S.	1987	Unknown
Aspects of petrography, palynology and inorganic constituents of subbituminous coals from Canyon Creek, Alaska : a high latitude tertiary coal field	Lamberson, Michelle Noreen	Geology	Geology	M.S.	1987	Spackman, Jr., William

Infiltration characteristics and hydrologic modeling of disturbed land, Moshannon, Pennsylvania	Lemieux, Corinne Renée	Geology	Geology	M.S.	1987	Gardner, Thomas
Shallow marine sedimentary processes along the Late Devonian Catskill shoreline in Pennsylvania : storm versus tidal influence	Loulé, Jean-Pierre	Geology	Geology	M.S.	1987	Slingerland, Rudy
Periodicities in color banding in sphalerite of the Upper Mississippi Valley District	Mason, Scott Edward	Geochemistry and Mineralogy	Geochemistry and Mineralogy	M.S.	1987	Barnes, Hubert
Ultrasonic velocity and porosity in the Kent Cliffs, N.Y. test well cores and the application to in situ stress determination	Meglis, Irene Llewellyn	Geophysics	Geophysics	M.S.	1987	Engelder, Terry ; Graham, Earl
Numerical modelling of chloride migration in a fractured bedrock aquifer, Bear Creek, Pennsylvania	Mosconi, Deborah Anne	Geology	Geology	M.S.	1987	Parizek, Richard
Sedimentology and paleoecology of miospores from the Middle to Upper Devonian Oneonta Formation: part of the Catskill Magnafacies, New York State	Schuyler, Andrew	Geology	Geology	M.S.	1987	Traverse, Alfred
The effects of acid precipitation on two soils of Pennsylvania	Schuyler, Sharon Stowe	Geochemistry and Mineralogy	Geochemistry and Mineralogy	M.S.	1987	Unknown
Fracture studies and in situ permeability testing with borehole packers	Shuman, Christopher A.	Geology	Geology	M.S.	1987	Parizek, Richard
Sedimentologic and paleoecologic importance of palynomorphs in Paleogene nonmarine depositional environments, central Bighorn Basin (Wyoming)	Farley, Martin Birtell	Geology	Geology	Ph.D.	1987	Traverse, Alfred
A study of the seismic crustal structure in the Valles Caldera region of Northern New Mexico	Felch, Roger N.	Geophysics	Geophysics	Ph.D.	1987	Alexander, Shelton
Sediment budgets on reclaimed coal surface mines in central Pennsylvania	Gryta, Jeffrey J.	Geology	Geology	Ph.D.	1987	Gardner, Thomas
The structure of alkaline earth aluminosilicate glasses and melts : a spectroscopic study	Merzbacher, Celia I.	Geochemistry and Mineralogy	Geochemistry and Mineralogy	Ph.D.	1987	White, William B.
A comparison of deterministic and geostatistical modeling methods as applied to numerical simulation of ground-water flow at the Savannah River Plant, South Carolina	Root, Robert William	Geology	Geology	Ph.D.	1987	Parizek, Richard
Assessing the potential for calcite dissolution in coastal saltwater mixing zones	Sanford, Ward Earl	Geology	Geology	Ph.D.	1987	Parizek, Richard
A statistical analysis of discontinuous arroyos in northwest New Mexico, U.S.A. : topographic, lithologic, and vegetational controls	Touysinhthiphonexay, Kimball C. N.	Geology	Geology	Ph.D.	1987	Gardner, Thomas W.
The Chemistry of Coal Maceral Fluorescence: With Special Reference to the Huminite/Vitrinite Group	Lin, Rui	GEOL	Geology	Ph.D.	1987	Davis, Alan
Salona-Coburn bryozoans : systematics, paleoecology and sedimentologic interpretation of a middle ordovician fauna from central Pennsylvania	Arens, Nan Crystal	Geology	Geology	M.S.	1988	Cuffey, Roger J.
Partitioning of elements between silicate melt and salt water at mantle conditions	Ayers, John C.	Geochemistry and Mineralogy	Geochemistry and Mineralogy	M.S.	1988	Eggler, David

Upper mantle P-wave velocity structure beneath southern Africa from P^{n} waves	Clouser, Robert H.	Geophysics	Geophysics	M.S.	1988	Langston, Charles
Paleoenvironmental interpretation of the Lower Silurian Tuscarora Formation palynomorph suite in central Pennsylvania	Desimone, Leslie A.	Geology	Geology	M.S.	1988	Traverse, Albert
Relationship of remotely sensed spot data to [sic] infiltratioan capacity of surface mined land in central Pennsylvania	Guebert, Michael Dean	Geology	Geology	M.S.	1988	Gardner, Thomas
An investigation into the gravitational perturbations which are exerted upon an earth orbiting satellite	Johnson, Laurie	Engineering Science	Earth Science	M.S.	1988	Richard Llorens
The response of a cylindrical target : implications for ground-penetrating radar	Low, Steven P.	Geophysics	Geophysics	M.S.	1988	Greenfield, Roy
Thermal-mechanical controls on seismicity in the San Andreas fault zone of Northern and Central California	Miller, Cynthia Kay	Geophysics	Geophysics	M.S.	1988	Furlong, Kevin
Epicenter determination of California earthquakes using single-station data	Nathman, Neal J.	Geophysics	Geophysics	M.S.	1988	Unknown
Geomorphic significance of longitudinal stream profiles in fluviokarsts	Sasowsky, Ira D.	Geology	Geology	M.S.	1988	White, William
Paleozoic lichenoporid-like bryozoans	Tang, Su	Geology	Geology	M.S.	1988	Cuffey, Roger J.
Trough cross-stratification geometry and methods for determination of paleoflow direction	Tchinda, Fidèle	Geology	Geology	M.S.	1988	Duke, William
Source of anomalous barium in groundwater supplies of Indiana County, Pa	Wardrop, Richard T.	Geology	Geology	M.S.	1988	Parizek, Richard
Three-dimensional modeling of seismic structure in the Puget Sound region	White, Daniel J.	Geophysics	Geophysics	M.S.	1988	Unknown
Electromagnetic wave propagations in disrupted coal seam	Wu, Shengdong	Geophysics	Geophysics	M.S.	1988	Greenfield, Roy
Calculation of multivariable phase diagrams : a computer strategy based on generalized thermodynamics	Connolly, James Alexander Denis	Geochemistry and Mineralogy	Geochemistry and Mineralogy	Ph.D.	1988	Kerrick, Derrill M.
Studies in hydrothermal phenomena : (1) the solubility of silver sulfide in aqueous sulfide solutions to 300 ℃; (2) a paragenesis and fluid inclusion study of polymetallic vein mineralization in the Big Creek mining district, central Idaho	Gammons, Christopher H.	Geochemistry and Mineralogy	Geochemistry and Mineralogy	Ph.D.	1988	Rose, Arthur
Geochemistry of the Stratiform Zinc-Lead-Barite Mineralization at the Meggen Mine Federal Republic of Germany	Geer, Kristen Anders	Geochemistry and mineralogy.	Geochemistry and mineralogy.	Ph.D.	1988	Ohmoto, Hiroshi
Geochemistry of the stratiform zinc-lead-barite mineralization at the Meggen mine, Federal Republic of Germany	Geer, Kristen Anders	Geochemistry and Mineralogy	Geochemistry and Mineralogy	Ph.D.	1988	Ohmoto, Hiroshi
Chemical and isotopic kinetics of sulfate reduction by organic matter under hydrothermal conditions	Kaiser, Charles John	Geochemistry and Mineralogy	Geochemistry and Mineralogy	Ph.D.	1988	Ohmoto, Hiroshi
The chemistry of coal maceral fluorescence : with special reference to the huminite/vitrinite group	Lin, Rui	Geology	Geology	Ph.D.	1988	Davis, Alan

A land cover change study utilizing landsat multispectral scanner data in Lancaster County, Pennsylvania	Ness, Mark William	Earth Science	Earth Science	Ph.D.	1988	Crane, Robert (Geography)
Geochemistry of nutrient elements in water and sediment of the Tuy River basin, Venezuela	Ramirez-Rojas, Armando José	Geochemistry and Mineralogy	Geochemistry and Mineralogy	Ph.D.	1988	Rose, Arthur W.
Economies of Scale in the Baltimore Metropolitan Area: Measurment and Change	Schroeder, Kurt A.	Geology	Geology	Ph.D.	1988	Rodgers, Allan L.
Tracing the microscopical and chemical origin of huminitic macerals in coal	Stout, Scott Alan	Geology	Geology	Ph.D.	1988	Spackman, William
The effect of dissolved catechol on the dissolution of amorphous silica in seawater	Swanson, Karen Anne	Geochemistry and Mineralogy	Geochemistry and Mineralogy	Ph.D.	1988	Deines, Peter ; Lasaga, Antonio
Depositional environment and petrography of the Upper Freeport limestone in Indiana and Armstrong Counties, Pennsylvania	Weedman, Suzanne Dallas	Geology	Geology	Ph.D.	1988	Guber, Albert
Fractal theory applied to the San Andreas fault system : the relationship between fault geometry inferred from geologic data and from geophysical data	Fenoglio, Mark A.	Geosciences	Geosciences	B.S.	1989	Unknown
Early diagenesis of iron in coastal marine sediments : Chincoteague Bay and Wallops Island, Virginia	Bluth, Virginia Seymour	Geochemistry and Mineralogy	Geochemistry and Mineralogy	M.S.	1989	Kump, Lee
Quantitative characterization of unsaturated fluid flow behavior in disturbed mine spoil : two nuclear methodologies	Diodato, David M.	Geology	Geology	M.S.	1989	Parizek, Richard
Cepstral Analysis and Spectral Extension Techniques for Source Depth Determination	Dunn, William H.	Unknown	Unknown	M.S.	1989	Unknown
Numerical simulations of tidal and wind-driven circulation in the Cretaceous Interior Seaway of North America	Ericksen, Marc C.	Geosciences	Geosciences	M.S.	1989	Unknown
Numerical Simulations of Tidal and Wind Driven Circulation in the Cretaceous Interior Seaway of North America	Ericksen, Marc C.	Geosciences	Geosciences	M.S.	1989	Slingerland, Rudy
The sedimentology and revised internal stratigraphy of the lower silurian medina group in outcrop, Ontario and New York	Fawcett, Peter J.	Geology	Geology	M.S.	1989	Duke, William
Identification of Acid Producing Zones Within a Reclaimed Surface Mine Utilizing Thermal Surveying	Fielder, James D.	Unknown	Unknown	M.S.	1989	Unknown
Fractures in the Lockport Dolomite of western New York and southern Ontario 1. Veins: Constraints on late Paleozoic fluid circulation 2. Asymmetric re-entrants in the Niagara Escarpment: a case for neotectonic joints in North America	Gross, Michael R.	Geosciences	Geosciences	M.S.	1989	Engelder, Terry
Upper crustal velocities and structural imaging of the Garlock Fault zone, Mojave Desert, California	Jizeng, Qin	Geophysics	Geophysics	M.S.	1989	Unknown
Predicting the locations of mid-cretaceous wind-driven upwelling and productivity : a critical evaluation	Kruijs, Eddy	Geology	Geology	M.S.	1989	Barron, Eric
Effects of water table fluctuation and meteorological parameters on radon-222 concentration and mobility in soil	Marvin, Richard K.	Geology	Geology	M.S.	1989	Parizek, Richard

Time domain analysis of electromagnetic scattering for a three dimensional tunnel in the presence of a vertically oriented electric dipole	Moran, Mark L.	Geophysics	Geophysics	M.S.	1989	Greenfield, Roy
Isostasy and eustasy on the OSA Peninsula, Costa Rica : unraveling the late quaternary geologic history through uplift and sea level change	Pinter, Nicholas M.	Geology	Geology	M.S.	1989	Gardner, Thomas
Correlatable fracture toughness anisotropy and surface morphology of siltstones of the Ithaca formation, Watkins Glen, New York, Appalachian Plateau	Scott, Paul A.	Geosciences	Geosciences	M.S.	1989	Engelder, Terry
A two-dimensional model study of the Somerset isostatic residual gravity anomaly in western Pennsylvania	Sydow, Norman J.	Geophysics	Geophysics	M.S.	1989	Unknown
Development of type curves for the characterization of physical and hydrological parameters for zones of fracture concentration	Weiss, Richard Alfred	Geosciences	Geosciences	M.S.	1989	Parizek, Richard
A study of the distribution of pyrite in the upper and lower Clarion coal seams and its preparation plant products	White, Timothy S.	Geology	Geology	M.S.	1989	Davis, Alan
The dissolution kinetics of siderite and its effect on acid mine drainage	Dresel, P. Evan	Geochemistry and Mineralogy	Geochemistry and Mineralogy	Ph.D.	1989	Rose, Arthur
The origin, emplacement, and deformation of the Crete de la Taillante oceanic complex, Queyras, Western French Alps	Garland, Kathleen A.	Geology	Geology	Ph.D.	1989	Gold, David P.
Hydrothermal replacement of calcite by sphalerite in a temperature gradient	Gould, William Wallace	Geochemistry and Mineralogy	Geochemistry and Mineralogy	Ph.D.	1989	Barnes, Hubert L.
Geochemical investigations of the redbed-associated stratiform copper mineralization at Kamoto Principal (Central Affican Copperbelt), Zaire	Hoy, Lawrence Dana	Geochemistry and Mineralogy	Geochemistry and Mineralogy	Ph.D.	1989	Ohmoto, Hiroshi
Studies of disseminated gold deposits near Carlin, Nevada : evidence for a deep geologic setting of ore formation	Kuehn, Carl A.	Geology	Geology	Ph.D.	1989	Rose, Arthur
Regularization and Backus-Gilbert estimation in nonlinear inverse problems: application to magnetotellurics and surface waves	Rodi, William L.	Geophysics	Geophysics	Ph.D.	1989	Greenfield, Roy
Mechanisms of pyrite and marcasite formation froM.S.olutions between 25 and 300 čelsius	Schoonen, Martin A. A.	Geochemistry and Mineralogy	Geochemistry and Mineralogy	Ph.D.	1989	Barnes, Hubert L.
Mechanisms of pyrite and marcasite formation from solutions between 25 and 300 čelsius	Schoonen, Martin A. A.	Geochemistry and Mineralogy	Geochemistry and Mineralogy	Ph.D.	1989	Barnes, H. L.
In Situ Seismic Anisotropy and Its Relationship to Crack and Rock Fabrics	Lee, Jung	GPHYS	Geophysics	Ph.D.	1989	Alexander, Shelton
Water sample bias caused by monitoring well construction and sampling procedures	Giles, David	Earth Science	Earth Science	B.S.	1990	Unknown
Investigation of the potential of a petroleum geochemical exploration technique to delineate petroleum-contaminated ground water	Abdo, Ginette A.	Geology	Geology	M.S.	1990	Parizek, Richard
The effect of fluid chemistry on equilibrium fluid distribution within a Novaculite	Lee, Vivian W.	Geosciences	Geosciences	M.S.	1990	Mackwell, Stephen
A semianalytical method for low earth orbit satellite predictions	McCormick, Joseph	Engineering Science	Earth Science	M.S.	1990	John J. Gavigan
Grain growth of porous olivine aggregates at ambient pressure	Nichols, Steven J.	Geophysics	Geophysics	M.S.	1990	Mackwell, Stephen

A geologic database of the USSR : geological similarity analysis and description of USSR rock type and mineral resource distributions	Pilant, Andrew Ness	Geosciences	Geosciences	M.S.	1990	Gold, David P. ; Griffiths, John C.
A geologic Database of the USSR: Geological Similarity Analysis and Description of USSR Rock Type and Mineral Resource Distributions.	Pilant, Andrew Ness	Geosciences	Geosciences	M.S.	1990	Unknown
The Effects of Depositional Environment on Vitrinite Secondary Fluorescence	Rathbone, Robert F.	Geology	Geology	M.S.	1990	Davis, Alan
Lithofacies distribution of the silurian keefer sandstone member of the Mifflintown formation of central Pennsylvania	Shuster, Edward L.	Geology	Geology	M.S.	1990	Guber, Albert
Dynamic modeling of catastrophic landslides	Sousa, James	Geology	Geology	M.S.	1990	Barry Voight
A quantitative assessment of the natural abatement of acid mine drainage-contaminated groundwater by interaction with aquifer media	Stahl, Andrew D.	Geology	Geology	M.S.	1990	Parizek, Richard
Mineralogic, fluid inclusion, and stable isotope studies of the Rich Gulch gold deposit, Plumas County, California : an extension of the Mother Lode hydrothermal system	Troup, Thomas L.	Geochemistry and Mineralogy	Geochemistry and Mineralogy	M.S.	1990	Kerrick, Derrill
Subduction of the Cocos Ridge and vertical movement of western Costa Rica	Verdonck, David	Geophysics	Geophysics	M.S.	1990	Furlong, Kevin
Effects of paleogeology, chemical weathering, and climate on the global geochemical cycle of carbon dioxide	Bluth, Gregg Jon Seymour	Geochemistry and Mineralogy	Geochemistry and Mineralogy	Ph.D.	1990	Kump, Lee
Effects of Paleogeology, chemical Weathering, and Climate on the Global Geochemical Cycle of Carbon Dioxide.	Bluth, Gregg Jon Seymour	Geochemistry and mineralogy	Geology	Ph.D.	1990	Kump, Lee
Petrogenesis and mantle source of igneous rocks in the Crazy Mountains, Montana	Dudas, Francis Ors	Geochemistry and Mineralogy	Geochemistry and Mineralogy	Ph.D.	1990	Eggler, David
Identification of Density Induced Interfaces in Regional Groundwater Flow Systems.	Filley, Thomas Howard	Geosciences	Geology	Ph.D.	1990	Parizek, Richard
An integrated model of tectonics and sedimentation for the Newark basin	Huntoon, Jacqueline E.	Geology	Geology	Ph.D.	1990	Kevin P. Furlong, Rudy L. Slingerland
Higher order behavior of earth materials: elasticity of sodium chloride and wustite, and thermal expansion at high pressure	Kim, Hye Sun	Geophysics	Geophysics	Ph.D.	1990	Graham, Earl
In situ seismic anisotrophy and its relationship to crack and rock fabrics	Lee, Jung Mo	Geophysics	Geophysics	Ph.D.	1990	Alexander, Shelton
Geology and geochemistry of the Redstone stratiform copper deposit, Northwest Territories, Canada	Lustwerk, Rigel Lisa	Geochemistry and Mineralogy	Geochemistry and Mineralogy	Ph.D.	1990	Rose, Arthur
The geochemical behavior of sulfur in silicate magmas during intrusion, with respect to magma-country rock interaction	Poulson, Simon Roger	Geochemistry and Mineralogy	Geochemistry and Mineralogy	Ph.D.	1990	Ohmoto, Hiroshi
Surface hydrology of drainage basins disturbed by surface mining and reclamation, central Pennsylvania	Ritter, John B.	Geosciences	Geosciences	Ph.D.	1990	Gardner, Thomas
Surface Hydrology and Drainage Basins Distributed by Surface Mining and Reclamation, Central Pennsylvania	Ritter, John B.	Geosciences	Geosciences	Ph.D.	1990	Garnder, Thomas W.

Determination of critical factors in the simulation of Eocene global climate, with special reference to North America	Sloan, Lisa Cirbus	Geosciences	Geosciences	Ph.D.	1990	Barron, Eric
Determination of Critical Factors in the Simulation of the Eocence Global Climate with	Sloan, Lisa Cirbus	Geosciences	Geosciences	Ph.D.	1990	Barron, Eric
Crystal chemistry and ceramic processing of rare earth chalogenide optical and electronic materials	Vaughan, Cheryl M.	Solid State Science	Earth Science	Ph.D.	1990	White, William S.
The ilmenite-spinel equilibrium in the system iron-titanium-vanadium-oxygen, and its bearing on the distribution of iron, titanium and vanadium in igneous rocks	Verburg, Laurentius Bernardus Martinus	Geochemistry and Mineralogy	Geochemistry and Mineralogy	Ph.D.	1990	Muan, Arnulf
Systematics and biostratigraphy of the Middle Ordovician to Lower Silurian Chitinozoans of the Tabuk and Qasim areas of the Arabian Peninsula	Al-Hajri, Said	Geosciences	Geosciences	M.S.	1991	Traverse, Alfred
Rotation of elongate porphyroblasts in a shear zone	Beam, Eric C.	Geosciences	Geosciences	M.S.	1991	Fisher, Donald
Distribution and chemical associations of gold in a laterite, Igarapé Bahia gold deposit, Pará Province, Brazil	Bliss, Linda N.	Geosciences	Geosciences	M.S.	1991	Machesky, Michael
A Raman spectroscopic study of aqueous lead precipitates	Ebbert, Charlotte M.	Geosciences	Geosciences	M.S.	1991	White, William
Determination of the heat of proton binding on alumina using microcalorimetry	Jacobs, Peter F.	Geochemistry and Mineralogy	Geochemistry and Mineralogy	M.S.	1991	Machesky, Michael
The origin and longitudinal distribution of placers in gravel-bed streanm deposits : a mathematical model and field study of the Black Hills terrace gravels	Sauermann, Roland P.	Geology	Geology	M.S.	1991	Slingerland, Rudy
Trace element analysis of mantle xenoliths from the Colorado-Wyoming border : implications for mantle evolution	Welt, Frederick Gordon Patton	Geochemistry and Mineralogy	Geochemistry and Mineralogy	M.S.	1991	Eggler, David
Coalification patterns of the Pennsylvanian coal measures in the Appalachian foreland basin, western and southcentral Pennsylvania	Zhang, Etuan	Geology	Geology	M.S.	1991	Davis, Alan
Array observations of shear-coupled PL and shear-coupled P waves in western Europe	Zhang, Jie	Geophysics	Geophysics	M.S.	1991	Langston, Charles
A contribution to the inversion of seismic body waves for earth structure and seismic source parameters	Ammon, Charles J.	Geology	Geophysics	Ph.D.	1991	Langston, Charles
Acetate decomposition in hydrothermal solutions	Bell, Julie Lynn Schleusener	Geochemistry and Mineralogy	Geochemistry and Mineralogy	Ph.D.	1991	Barnes, Hubert
Relationships between formational mechanisms and variations in properties of pyrite crystals synthesized between temperatures of 150 and 350 degree celsius	Graham, Ursula Maria	Geochemistry and Mineralogy	Geochemistry and Mineralogy	Ph.D.	1991	Ohmoto, Hiroshi
Macropore flow on a reclaimed surface-mined watershed in central Pennsylvania : control on hillslope and surface hydrology	Guebert, Michael Dean	Geology	Geology	Ph.D.	1991	Gardner, Thomas
Natural hydraulic fracturing in the Bald Eagle Sandstone in central Pennsylvania and the Ithaca Siltstone at Watkins Glen, New York	Lacazette, Alfred Julian	Geosciences	Geosciences	Ph.D.	1991	Engelder, Terry

Aquifer-estuary interaction and vulnerability of ground-water supplies to sea-level-rise-driven saltwater intrusion : a thesis in geology	Navoy, A. S.	Geology	Geology	Ph.D.	1991	Parizek, Richard
Full wave tomography for imaging coal seam obstructions	Polzer, Robert S.	Geology	Geophysics	Ph.D.	1991	Greenfield, Roy
The acid crater lake system of Poás Volcano, Costa Rica : geochemistry, hydrology, and physical characteristics	Rowe, Gary L.	Geochemistry and Mineralogy	Geochemistry and Mineralogy	Ph.D.	1991	Brantley, Susan
A field and mathematical modeling study of the 2.8-billion-year-old Ventersdorp Contact Reef, Witwatersrand Basin, South Africa	Vogel, Koen R.	Geology	Geology	Ph.D.	1991	Slingerland, Rudy
A study of NORESS-array seismograms from local and regional events	Vogfjörd, Kristín S.	Geology	Geophysics	Ph.D.	1991	Langston, Charles
Scattering effects for teleseismic plane wave propagation in a heterogeneous layer over a homogeneous half-space	Wagner, Gregory Scott	Geology	Geophysics	Ph.D.	1991	Langston, Charles
Radon generation and transport in soils	Washington, John William	Geochemistry and Mineralogy	Geochemistry and Mineralogy	Ph.D.	1991	Rose, Arthur
Determination of lateral heterogeneity in surface wave velocity, using a 2-D fourier analysis method with applications to the basin and range	Yan, Ben	Geology	Geophysics	Ph.D.	1991	Alexander, Shelton
The Influence of Stress Relief on the Distribution of Microcracks in Anisotropic Rocks: A Laboratory Study of Compressibility, Ultrasonic Velocity, and Attenuation in Two Suites of Core	Meglis, Irene	GPHYS	Geosciences	Ph.D.	1991	Engelder, Terry
Solubility of gibbsite at 90 degrees in the presence of oxalic, malonic and succinic acids	Calpin, Sharon A.	Geosciences	Geosciences	B.S.	1992	Unknown
Calibration of isotopic paleothermometers in central Greenland using borehole temperatures	Cuffey, Kurt M.	Earth Science	Earth Science	B.S.	1992	Unknown
A simulated weathering experiment investigating the factors controlling the generation and neutralization of acid mine drainage	Daub, Gary A.	Geosciences	Geosciences	B.S.	1992	Rose, Arthur
Data Enhancement of Gulf Coast Seismic Data	Asad, Abu	Unknown	Unknown	M.S.	1992	Langston, Charles
Characterization of the transition from inland-ice to ice-stream flow	Jablunovsky, Gregory M.	Geosciences	Geosciences	M.S.	1992	Alley, Richard
Linking a general circulation model and a mesoscale model to examine the effects of model resolution on a simulated last glacial maximuM.S.torm in the western North Atlantic Ocean	Leon Guerrero, Timothy A.	Geosciences	Geosciences	M.S.	1992	Barron, Eric
Linking a general circulation model and a mesoscale model to examine the effects of model resolution on a simulated last glacial maximum storm in the western North Atlantic Ocean	Leon Guerrero, Timothy A	Geosciences	Geosciences	M.S.	1992	Barron, Eric
Design of stable channels on reclaimed mine lands, using the Stable Slope, and Sediment Transport Model	McKenney, Rose A.	Geosciences	Geosciences	M.S.	1992	Gardner, Thomas
Modeling study of the uptake of fossil-fuel carbon dioxide	Mellinger, Rebecca K.	Geosciences	Geosciences	M.S.	1992	Kasting, James
Assessment of NCAR general circulation model precipitation in comparison with observations	Schultz, Peter A.	Geosciences	Geosciences	M.S.	1992	Barron, Eric

An investigation of possible variations in the structural parameters of pyrite, using x-ray powder diffraction and the Rietveld method of structure refinement	Wayne, Amy	Geosciences	Geosciences	M.S.	1992	Smith, Deane
Heat and Volatile Fluxes Integrated over Four Decades at Grimsvotn Volcano, Iceland	Agustsdottir, Anna	GEOSC	Geosciences	M.S.	1992	Brantley, Susan
Geochemistry of diagenetic pressure seal information	Albrecht, Wolfgang	Geochemistry and Mineralogy	Geochemistry and Mineralogy	Ph.D.	1992	Ohmoto, Hiroshi
High resolution palynostratigraphy across a marine Cretaceous-Tertiary boundary interval, Falls County, Texas	Beeson, Dale C.	Geosciences	Geosciences	Ph.D.	1992	Traverse, Alfred
Post-Alleghanian thermal and unroofing history of the Appalachian Basin, Pennsylvania	Blackmer, Gale C.	Geology	Geology	Ph.D.	1992	Gold, David
The macromolecular geochemistry of bituminous vitrain	Cody, George D.	Geosciences	Geosciences	Ph.D.	1992	Davis, Alan
Feasibility study for the materials science approach to volcano eruption prediction	Cornelius, Reinold Rudolf	Geosciences	Geosciences	Ph.D.	1992	Voight, Barry
Geochemical and hydrologic dynamics in evaporative groundwater-dominated lakes of glaciated Montana and North Dakota	Donovan, Joseph J.	Geosciences	Geosciences	Ph.D.	1992	Parizek, Richard
Dynamics of Krafla Volcano, Iceland for the decade 19765 through 1985	Ewart, James A.	Geology	Geology	Ph.D.	1992	Voight, Barry
The geochemistry of uranium, thorium, and radium in soils of the eastern United States	Greeman, Daniel Jacob	Geosciences	Geosciences	Ph.D.	1992	Rose, Arthur
Variation in the petrological, mineralogical, and palynological characteristics of some Upper Pennsylvania coals from the northern Appalachian Basin	Karytsas, Constantine S.	Geology	Geology	Ph.D.	1992	Davis, Alan
A three-dimensional numerical investigation of storm event bed genesis of the Texas-Louisiana continental shelf	Keen, Timothy R.	Geosciences	Geosciences	Ph.D.	1992	Slingerland, Rudy
Dissolution kinetics of calcite and quartz under surface reaction control	MacInnis, Ian Neil	Geochemistry and Mineralogy	Geochemistry and Mineralogy	Ph.D.	1992	Brantley, Susan
Tectonic evolution of the Kingston Range, Death Valley, California	McMackin, Matthew R.	Geology	Geology	Ph.D.	1992	Voight, Barry
The influence of stress relief on the distribution of microcracks in anisotropic rocks : a laboratory study of compressibility, ultrasonic velocity, and attenuation in two suites of core	Meglis, Irene Llewellyn	Geology	Geophysics	Ph.D.	1992	Engelder, Terry
Evolution of the Appalachian Highlands : geochemistry, hydrogeology, cave-sediment magnetostratigraphy, and historical geomorphology of the East Fork Obey River, Fentress County, Tennessee	Sasowsky, Ira D.	Geology	Geology	Ph.D.	1992	White, William
Analysis of fracture indicators across the Appalachian Orogen in Pennsylvania, using multiple-scale remote sensing imagery and geomorphic parameters	Shuman, Christopher A.	Geosciences	Geosciences	Ph.D.	1992	Parizek, Richard
Geology and inorganic geochemistry of groundwater around the Reutgers Nease Superfund Site, Centre County, Pennsylvania	Bologa, Jeffrey L.	Geosciences	Geosciences	B.S.	1993	Unknown

The effect of local fold anomalies on the geologic nature of the Tusseyville Fault, Centre Hall, Pennsylvania	Cox, David A.	Geosciences	Geosciences	B.S.	1993	Unknown
The use of borehole dilution tests to study groundwater flow in the lower Kittanning coal	Gordon, Shana Z.	Geosciences	Geosciences	B.S.	1993	Unknown
Accumulation and preservation of organic carbon in Peru margin sediments	Laarkamp, Kirsten L.	Geosciences	Geosciences	B.S.	1993	Unknown
The hydrogeologic and geologic factors associated with acid mine drainage at the Torquato No. 2 strip mine, Adams Township, Cambria County, PA	Maher, Thomas P.	Geosciences	Geosciences	B.S.	1993	Unknown
Hydraulic conductivity distribution within an unconfined aquifer near Port Matilda, Pennsylvania	Miller, Theresa Ann	Geosciences	Geosciences	B.S.	1993	Unknown
Strain analysis of axemann limestone using the Fry method	Mullen, Jennifer A.	Geosciences	Geosciences	B.S.	1993	Unknown
The use of remote sensing to track the progression of the underground coal mine fire at Centralia, PA	Shallenberger, James P.	Geosciences	Geosciences	B.S.	1993	Unknown
Possible role of pole reorientations and high obliquities in the formation of the outflow channels and runoff channels found on Mars	Snyder, Matthew D.	Geosciences	Geosciences	B.S.	1993	Unknown
Fracture apertures at depths of 10 to 12 kilometers within an ancient subduction zone: evidence from crack-seal microstructures	Wambold, Brett D.	Geosciences	Geosciences	B.S.	1993	Unknown
Semi-analytical modeling technique for wellhead protection area delineation in fractured carbonate geology eastern Lancaster County, Pennsylvania	Evans, R. Paul	Environmental Pollution Control	Geology	M.E.P.C.	1993	Unknown
Heat and volatile fluxes integrated over four decades at Grímsvötn volcano, Iceland	Agustsdóttir, Anna María	Geosciences	Geosciences	M.S.	1993	Brantley, Susan
Investigation of a dissolved oxygen monitoring system for pyrite oxidation studies	Bryant, Karen	Geosciences	Geosciences	M.S.	1993	Rose, Arthur
Kinematics of Faulting in Costa Rica	Carson, Beth	Unknown	Unknown	M.S.	1993	Engelder, Terry
Evaluation of the long term impact of domestic and farm groundwater supplies under Pennsylvania longwall mining conditions	Donohue, Timothy D. A.	Geosciences	Geosciences	M.S.	1993	Parizek, Richard
Source parameters from near regional earthquake data recorded at Garm, Tadjikistan	Ecker, Christine	Geosciences	Geosciences	M.S.	1993	Langston, Charles
Characterization of hydraulic conductivity heterogeneity in tertiary sediments within the General Separations Area Savannah River Site, South Carolina	Evans, Eric K.	Geology	Geology	M.S.	1993	Parizek, Richard
Modeling the effect of San Andreas fault structure on receiver functions using elastic 3-D finite-difference	Hammer, John K.	Geosciences	Geosciences	M.S.	1993	Langston, Charles
Minesoil texture, macropore development and the evolution of minesoil hydrology on reclaimed surface mines in Pennsylvania	Hayes, Kevin R.	Geosciences	Geosciences	M.S.	1993	Gardner, Thomas
Sulfur isotope analyses of micro-sized pyrite crystals by the laser ablation method	Kakegawa, Takeshi	Geosciences	Geosciences	M.S.	1993	Ohmoto, Hiroshi
The role of transverse drainage in the development of foreland folds	Mussuridis, Adonios A.	Geosciences	Geosciences	M.S.	1993	Slingerland, Rudy

Flexural modeling in a complex transform plate boundary : geodynamical implications for the evolution of the San Andreas fault system	Prims, Jordi	Geosciences	Geosciences	M.S.	1993	Furlong, Kevin
Biological and Physical Controls on the d13C and Biomarker Distribution in Suspended Organic Matter from the Peru Upwelling Zone	Yuhas, Katherine	Unknown	Unknown	M.S.	1993	Freeman, Katherine
A numerical modeling approach to estimation of parameters describing groundwater flow in coal-bearing rocks of the Allegheny Plateau	Abate, Christopher	Geosciences	Geosciences	Ph.D.	1993	Parizek, Richard
Scattering of seismic waves by irregular interfaces	Clouser, Robert H.	Geosciences	Geosciences	Ph.D.	1993	Langston, Charles
Diffusion in Mantle Minerals	Fisler, Diana Kim	Unknown	Unknown	Ph.D.	1993	Mackwell, Stephen
The effects of mechanical stratigraphy of failure mode and fracture spacing in the Monterey Formation of coastal California	Gross, Michael R.	Geosciences	Geosciences	Ph.D.	1993	Engelder, Terry
Numerical simulation of coupled heat transfer and gas flow in porous media with applications to acid mine drainage	Guo, Weixing	Geosciences	Geosciences	Ph.D.	1993	Parizek, Richard
The thermal maturity and petroleum potential of the Mississippian Chainman formation : implications for burial and thermal histories of east-central Nevada	Inan, Sedat	Geosciences	Geosciences	Ph.D.	1993	Davis, Alan
The development of zones of "undercompacted" shale relative to abnormal subsurface pressures in sedimentary basins	Leftwich, John T.	Geology	Geology	Ph.D.	1993	Engelder, Terry
Tectonic geomorphology and the late Cenozoic geology of the middle U.S. Atlantic passive margin	Pazzaglia, Frank James	Geosciences	Geosciences	Ph.D.	1993	Gardner, Thomas
Petrology and geochemistry of potassic and carbonatite magmas in the Rocky Boy stock, Bearpaw Mountains, Montana	Shank, Stephen Gaberdiel	Geosciences	Geosciences	Ph.D.	1993	Eggler, David
Hydrothermal kinetics of kaolinite-water interaction at pH 4.2 and 7.3, 130°C to 230°C	Soong, Chie.	Geosciences	Geosciences	Ph.D.	1993	Barnes, Hubert
Structure and dynamics of the San Andreas fault system in central and northern coastal California	Verdonck, David	Geosciences	Geosciences	Ph.D.	1993	Furlong, Structure
Hydraulic modeling in recent alluvial sediments of the fetterolf farm in Schuylkill County, Pa.	Appleby, Michael K.	Geosciences	Geosciences	B.S.	1994	Alexander, Shelton S.
A study of the surficial geology of the Paint Creek watershed Adams Township, Cambria County, Pennsylvania	Barras, Craig J.	Earth Science	Earth Science	B.S.	1994	Unknown
A determination of groundwater flow through chemical analysis of springs near Roaring Spring, Pennsylvania	Blevins, Rebecca Faye.	Earth sciences	Earth sciences	B.S.	1994	Unknown
Defining a pollution plume boundary in the Clarion 2 coal seam at the Kaufmann Mine in Clearfield, Pennsylvania	Chilek, Michael	Geosciences	Geosciences	B.S.	1994	Unknown
An energy policy for the 21st century : a solar-hydrogen energy system	Conway, Brendan	Earth Science	Earth Science	B.S.	1994	Unknown
Metamorphic reaction progress and CO_2 evolution in siliceous dolamites from north-central Pakistan	De Lurio, Jennifer Lynn	Geosciences	Geosciences	B.S.	1994	Unknown
Source of silica found in veins within an ancient subduction zone, Afognak Island, Alaska	Dzvonik, Joseph P.	Geosciences	Geosciences	B.S.	1994	Unknown

Radon concentrations as determined by thorium and uranium levels along Science Park Road, State College	Forester, Jeffrey A.	Earth sciences	Earth sciences	B.S.	1994	Rose, Arthur
An assessment on the reliability of SWIP water testing as a water quality indicator in community water systems	Leo, John.	Earth sciences	Earth sciences	B.S.	1994	Gold, David P.
The mechanics and kinematics of kink folding in the Martinsburg shale, PA route 873	Newdeck, Patricia Coleen	Geosciences	Geosciences	B.S.	1994	Unknown
Flow energy as determined from D_{90} and D_{50} in heterogenous cave sediments	Ombalski, Daniel W.	Geosciences	Geosciences	B.S.	1994	Unknown
Decomposition of carbon monoxide in an aqueous, anoxic environment and implications for the composition and oxidation state of the Earth's early atmosphere	Petsch, Steven T.	Geosciences	Geosciences	B.S.	1994	Unknown
Analysis of the Bryozoan fauna surrounding the Maysville bryozoan reef mounds	Pursell, Benjamin	Geosciences	Geosciences	B.S.	1994	Unknown
Rotation and deformation of chlorite-mica aggregates in the Martinsburg Slate	Rawling, Geoffrey Callis	Geosciences	Geosciences	B.S.	1994	Unknown
An analysis of the relationship between age and bathymetry in the Argentine, Angola and Brazil basins of the south Atlantic Ocean	Robinson, Scott William	Geosciences	Geosciences	B.S.	1994	Unknown
Influence of solution chemistry on the natural and artificial weathering of feldspars in the soil environment	Rufe, Eric Scott	Geosciences	Geosciences	B.S.	1994	Unknown
Study of Water Quality Improvements on Shamokin Creek	Slonaker, Dean J.	Geosciences	Geosciences	B.S.	1994	Unknown
Examination of element and volume flux during metamorphic segregation	Snyder, Wm. Scott	Geosciences	Geosciences	B.S.	1994	Unknown
Analysis of the rate and possible causes of iron depletion in acid mine drainage, alder run, Clearfield County, Pennsylvania	Sundie, Anthony	Geosciences	Geosciences	B.S.	1994	Unknown
Statistical analysis of asymmetries in the GISP2 ice-core record as an indicator of folding	Winckler, Shepard Stanho	Geosciences	Geosciences	B.S.	1994	Unknown
Grain growth behavior of the GISP2 ice core from central Greenland	Woods, Gregory A.	Geosciences	Geosciences	B.S.	1994	Unknown
A comparison of ground water vs. spring water geochemistry to evaluate acid forming potential of overburden at the Kaufmann surface mine, Clearfield County, Pennsylvania	Zahradnik, John	Geosciences	Geosciences	B.S.	1994	Unknown
The effect of disorder on the elastic constants of magnesium aluminate spinel	Dann, Deborah M.	Geosciences	Geosciences	M.S.	1994	Graham, Earl
Quaternary soil chronosequences on the lower terraces of the Susquehanna River, Pennsylvania	Engel, Scott Allen	Geosciences	Geosciences	M.S.	1994	Gardner, Thomas
Geochemical field evaluation of a lime addition method for inhibiting acid drainage from coal mine spoil, Clearfield County, Pennsylvania	Evans, Derek R.	Geosciences	Geosciences	M.S.	1994	Rose, Arthur
Response of snow accumulation to temperature variations in central Greenland	Kapsner, Wanda R.	Geosciences	Geosciences	M.S.	1994	Alley, Richard

Environmental controls on groundwater chemistry in an offshore island aquifer : Fiesta Key, Florida	Machusak, Donald D.	Geosciences	Geosciences	M.S.	1994	Kump, Lee
Evaluation of pesticide and nitrate mobility in a conduit-flow dominated karst basin	Underwood, Kristen L.	Geosciences	Geosciences	M.S.	1994	Parizek, Richard
Fold kinematics in the lower Paleozoic platform, Lost River Range, Idaho	Van Gundy, Susan Elizabeth	Geosciences	Geosciences	M.S.	1994	Fisher, Donald
Use of teleseismic broadband SV waves in source parameter studies	Wang, Mingguang	Geosciences	Geosciences	M.S.	1994	Langston, Charles
Evaluation of Digital Elevation Models, Remotely Sensed Data and Soil Data Bases as Sources of Input Parameters to SCS Runoff Models Using a Geographic Information System	Louis, Egide	GEOSC	Geosciences	M.S.	1994	Gardner, Thomas
Behavior of nutrients in groundwater of an agricultural valley and its riparian zone	Altman, Susan J.	Geosciences	Geosciences	Ph.D.	1994	Parizek, Richard
Kinematics and structural evolution of the slate belt and metamorphic core of an active arc-continent collision, Taiwan	Clark, Matthew Brooks	Geosciences	Geosciences	Ph.D.	1994	Fisher, Donald
Simulation of climate-sedimentary evolution : a comparison of climate model results to the geologic record for India and Australia	Fawcett, Peter J.	Geosciences	Geosciences	Ph.D.	1994	Barron, Eric
Application of linear elastic fracture mechanics to some problems of fracture propagation in rock and ice	Fischer, Mark Preston	Geosciences	Geosciences	Ph.D.	1994	Engelder, Terry
Reactions forming smythite, $Fe^{9}S^{11}$	Furukawa, Yoko	Geosciences	Geosciences	Ph.D.	1994	Barnes, Hubert
Hydrothermal precipitation and dissolution of silica : Part I. Conditions in geothermal fields and sedimentary basins : Part II. Experimental evaluation of kinetics	Polster, Wolfgang	Geochemistry and Mineralogy	Geochemistry and Mineralogy	Ph.D.	1994	Barnes, Hubert
The surface chemistry and dissolution kinetics of feldspar	Stillings, Lisa Lynn	Geosciences	Geosciences	Ph.D.	1994	Brantley, Susan
Geochemistry, petrology, and tectonic setting of archean basaltic and dioritic rocks from the N4 iron deposit, Serra dos Carajás, Pará, Brazil	Teixeira, João Batista G.	Geosciences	Geosciences	Ph.D.	1994	Eggler, David
The geochemistry, hydrogeology, and geomorphology of the Río Camuy drainage basin, Puerto Rico : a humid tropical karst	Troester, Joseph W.	Geology	Geology	Ph.D.	1994	White, William ; Parizek, Richard
Geomorphology, hydrogeology, geochemistry, and evolution of the karstic Lower Glen Rose Aquifer, south-central Texas	Veni, George	Geology	Geology	Ph.D.	1994	White, William
A reconnaissance study of the local earthquakes in Northern Tanzania	Anderson, Scott Richard	Geosciences	Geosciences	B.S.	1995	Unknown
Effect of limestone mineralogy and petrography on dissolution rate in wet flue gas desulfurization (WFGD) systems	DiGnazio, Frank J.	Earth sciences	Earth sciences	B.S.	1995	Unknown
A systematic study of the composition of the terrestrial planets and the moon based on a devolitalized chondrite/pyrolite model	Harp, David L.	Geosciences	Geosciences	B.S.	1995	Unknown
Biological involvement in the formation of moonmilk	Heil, Tiffani L.	Geosciences	Geosciences	B.S.	1995	Unknown
Middle ordovican extinction of North American trilobites	Hills, Elizabeth A.	Geosciences	Geosciences	B.S.	1995	Unknown
Stratigraphic architecture of deep-ramp carbonates: implications for accumulation of K-bentonites, middle ordovican, central Pennsylvania	Hoover, Andrew R.	Geosciences	Geosciences	B.S.	1995	Unknown

Magnitude and source depth estimates of earthquakes in Iran from regional observations	Karl, Sheri Lynn	Geosciences	Geosciences	B.S.	1995	Unknown
Using the cone penetrometer to determine hydraulic conductivity based on the dislocation method	Kondas, Andrew J.	Geosciences	Geosciences	B.S.	1995	Unknown
An analysis of the atmospheric loading and the geographic extent of the 8,000 calendar year BP holocene climate event	Mark, Linda Elizabeth	Geosciences	Geosciences	B.S.	1995	Unknown
An electrical resistivity investigation of the soil mantle overlying a fracture zone in Centre County, Pennsylvania	McGeehan, Brian M.	Geosciences	Geosciences	B.S.	1995	Unknown
Geology of the Lehigh Valley : a study in sinkholes	Miller, Brandon	Earth sciences	Earth sciences	B.S.	1995	Unknown
Environmental ethics as applied to the struggle between oil development and preservation in the Arctic National Wildlife Refuge, Alaska	Mowery, Rachel Ann	Earth sciences	Earth sciences	B.S.	1995	Unknown
The characteristics and genesis of subaerial fluvial levees from the lower Saskatchewan River near Cumberland House, Saskatchewan, Canada	Nelson, Steven E.	Geosciences	Geosciences	B.S.	1995	Unknown
Landscape evolution of the ridge and valley province in central Pennsylvania: a computer modeling study	Ober, Eric G.	Geosciences	Geosciences	B.S.	1995	Unknown
Passive treatment of acid mine drainage	Roos, Erik S. de.	Geosciences	Geosciences	B.S.	1995	Gold, David P.
Effects of municipal sewage sludge application in the neutralization of acid mine drainage, in the Kauffman demonstration project, Clearfield County, Pennsylvania	Schultz, Lori A.	Earth Science	Earth Science	B.S.	1995	Unknown
Wetlands as a Biological Sink for Toxic Metals	Shaffer, David J.	Earth Science	Earth Science	B.S.	1995	Gold, David P.
Geology and mineral resources of luzerne county, pennsylvania	Sklaney, Christopher L.	Earth Science	Earth Science	B.S.	1995	Gold, David P.
A computer study of the detection of the water table with ground-penetrating radar	Trudnak, Michael E.	Geosciences	Geosciences	B.S.	1995	Slingerland, Rudy
The distribution of foraminifera in the Indian Ocean during the late paleocene/early eocene	Walter, Krista A.	Geosciences	Geosciences	B.S.	1995	Unknown
Geochemical evaluation of alkaline addition and sewage sludge addition methods for preventing acid mine drainage using controlled field experiments, Clearfield County, Pennsylvania	Whitmire, Douglas L.	Geosciences	Geosciences	B.S.	1995	Unknown
Development of a remediation plan for a petroleum-contaminated aquifer in Altoona, PA	Williams, Edward R.	Earth Science	Earth Science	B.S.	1995	Unknown
Planetary accretion and the geophysical properties of Venus and Mars	Wyatt, Michael B.	Geosciences	Geosciences	B.S.	1995	Unknown
Determining the fractal dimesion of dendritic drainage patterns using geographic information systems software	Wyland, Thomas R.	Geosciences hydrogeology option	Geosciences	B.S.	1995	Unknown
Depositional environments and stratigraphic framework of the late Devonian Elk Reservoir sands in Central Pennsylvania	Al-Mugheiry, Mohammed N.	Geosciences	Geosciences	M.S.	1995	Slingerland, Rudy
Carbon-isotope abundances of alkenones froM.S.ediments of the Peru margin : a potential oceanic carbon dioxide concentration proxy and El Niño indicator	Cooper, Frances G.	Geosciences	Geosciences	M.S.	1995	Freeman, Katherine

Carbon-isotope abundances of alkenones from sediments of the Peru margin : a potential oceanic carbon dioxide concentration proxy and El Niño indicator	Cooper, Frances G.	Geosciences	Geosciences	M.S.	1995	Freeman, Katherine
Use of biogeochemical gold exploration in a tropical terrain : Igarape Bahia gold deposit, Para province, Brazil	Kato, Tetsuya.	Geosciences	Geosciences	M.S.	1995	Rose, Arthur
Nature and occurrence of polyphase crystalline inclusions in garnet and pyroxene megacrysts from the Tanoma kimberlite, southwestern Pennsylvania	Keswa, Chuma Mbalu.	Geosciences	Geosciences	M.S.	1995	Gold, David
Volatile emissions from Oldoinyo Lengai volcano, Tanzania	Koepenick, Kevin Wells.	Geosciences	Geosciences	M.S.	1995	Brantley, Susan
The post-Alleghanian tectonic history of the Appalachian Basin based on joint patterns in Devonian black shales	Loewy, Staci Lynn	Geosciences	Geosciences	M.S.	1995	Engelder, Terry
Weathering of biotite in a tropical forest soil, Luquillo Mountains, Puerto Rico	Murphy, Sheila F.	Geosciences	Geosciences	M.S.	1995	Brantley, Susan
Evaluation of digital elevation models, remotely sensed data and soil data bases as sources of input parameters to SCS runoff model using a Geographic Information System	Nizeyimana, Egide.	Geosciences	Geosciences	M.S.	1995	Gardner, Thomas
Early Pleistocene Glacial Lake Lesley, West Branch Susquehanna River valley, central Pennsylvania	Ramage, Joan Miriam.	Geosciences	Geosciences	M.S.	1995	Gardner, Thomas
Oceanic transform boundaries : rheology, dynamics, and the age offset limit	Sheaffer, Steven D.	Geosciences	Geosciences	M.S.	1995	Furlong, Kevin
Breccia-pipe Hosted U-Cu Deposits in the Grand Canyon Area	Gardner, Ken	Geosciences	Geosciences	Ph.D.	1995	Gold, David.
Size distribution in sediments, synthesis, and formation mechanism of framboidal pyrite	Wilkin, Richard T.	Geosciences	Geosciences	Ph.D.	1995	Barnes, Hubert
Fold kinematics from a strain analysis of the Reedsville shale	Adams, Peter Nelson	Geosciences	Geosciences	B.S.	1996	Unknown
A comparison of seismic hazards in San Francisco and Wellington, New Zealand : mitigation strategies for Wellington using San Francisco model	Bilek, Susan L.	Geosciences	Geosciences	B.S.	1996	Unknown
The geology and structure of the ascom area, between bedford and everett pa.	Bordatto, Omar	Earth Science	Earth Science	B.S.	1996	Gold, David P.
A study of vein distribution, texture, and composition within the basal unit of the Martinsburg formation, Great Valley, west of Harrisburg Pa	Borella, Josh Walter	Geosciences	Geosciences	B.S.	1996	Unknown
A comprehensive eruptive history of Merapi volcano, central Java, Indonesia, from 1768 to 1984	Constantine, Emily K.	Geosciences	Geosciences	B.S.	1996	Unknown
The nature and form of fulgurites with special emphasis on rock and soil fulgurites from Alta, Utah	Duerr, Christopher D.	Geosciences	Geosciences	B.S.	1996	Unknown
Geochemical and geophysical constraints on iron ore genesis in the Gatesburg Formation, State College, PA	Gaffney, Sean P.	Geosciences	Geosciences	B.S.	1996	Unknown
Seismicity patterns in northern Tanzania : evidence for southward propagation of the Kenya rift	Geyer, Stacey L.	Geosciences	Geosciences	B.S.	1996	Unknown

Grain-scale deformation and associated c-axis fabrics from the GISP2 ice core in central Greenland	Green, Robert Patrick	Geosciences	Geosciences	B.S.	1996	Unknown
The economic worth of wetlands: a comparative study	Jones, Stephen	Earth sciences	Earth sciences	B.S.	1996	Unknown
A shallow seismic refraction investigation of glacial deposits found in the Hudson River Valley, New York	Kaleta, Nathan	Geosciences	Geosciences	B.S.	1996	Alexander, Shelton S.
A regional hydrogeologic characterization of the lower devonian rigeley member of the Old Port Formation throughout the Appalachian Mountain section of the valley and ridge physiographic province of central Pennsylvania	Locke, Adam L.	Geosciences	Geosciences	B.S.	1996	Unknown
Soil contamination in petroleum hydrocarbons, metals, and calcium chloride related to a junkyard near State College, Pennsylvania	Miller, Victoria M.	Earth Science	Earth Science	B.S.	1996	Unknown
Modern reef-flat bryozoans at Komaka, Okinawa: comparisons and implications for the paleoecology of reefs and bryozoans	Null, Stacy	Geosciences	Geosciences	B.S.	1996	Unknown
The use of sulfate-reducing bacteria for in-situ bioremediation in treatment of acid mine drainage	Patula, James C.	Earth Sciences	Earth Sciences	B.S.	1996	Rose, Arthur
Petrographic characteristics of the Elk Basin sandstones and their correlation with joint spacing	Pinkerton, Paul D.	Geosciences	Geosciences	B.S.	1996	Unknown
Identification and analysis of the bryozoans of the sub-rodman middle ordovician limestones of central Pennsylvania	Price, Gretchen M.	Geosciences	Geosciences	B.S.	1996	Unknown
Stratigraphic analysis and paleoenvironmental interpretation of the Central Pennsylvania Axemann Limestone Formation	Schrauder, Mimi	Earth sciences	Earth sciences	B.S.	1996	Patzkowsky, Mark E.
A paleoecologic analysis of domal trepostomes of the Dolly Ridge Formation (ordovician) in Pendleton County, West Virginia	Smith, Andrea Lynn	Geosciences	Geosciences	B.S.	1996	Unknown
The effects of weathering on the measured surface area of glacial soils	Smith, Michelle L.	Geosciences	Geosciences	B.S.	1996	Unknown
Subdivision and correlation of middle ordovician carbonates: Union Furnace and Roaring Spring quarries, Huntingdon and Blair Counties, Pennsylvania	Tormey, Blair R.	Geosciences	Geosciences	B.S.	1996	Unknown
A biostratigraphic analysis of the branching trepostomes of the middle ordovician Dolly Ridge formation in West Virginia	Walaitis, Heather E.	Geosciences	Geosciences	B.S.	1996	Unknown
The influence of Florida bay tides on the piezometric surfaces of the Florida Keys: Long Key, Florida	Weltmer, Micah A.	Geosciences	Geosciences	B.S.	1996	Unknown
The effect of surface factors on light hydrocarbon concentrations in the environment	Vice, Daniel Hoy	Earth sciences	Earth sciences	D.Ed.	1996	Hallack, Philip
The kinetics of hydrogen diffusion in single crystal clinopyroxene	Carpenter, Susan J.	Geosciences	Geosciences	M.S.	1996	Mackwell, Stephen J.
The study of lignin and its degradation in a peat and two lacustrine deposits using tetramethylammonium hydroxide (TMAH) thermochemolysis	Carson, Daniel Michael	Geosciences	Geosciences	M.S.	1996	Hutcher, Patrick
Diversion well treatment of acid water, Lick Creek, Tioga County, PA	Cram, J. Corey	Geosciences	Geosciences	M.S.	1996	Parizek, Richard

A systematic vein network within an accretionary prism : Kodiak Formation, Alaska	Everett, Mark Capen	Geosciences	Geosciences	M.S.	1996	Brantley, Susan
One-and two-dimensional modeling of groundwater flow in rapidly subsiding sedimentary basins	Gordon, David Scott	Geosciences	Geosciences	M.S.	1996	Flemings, Peter
Uranium-series disequilibrium in soils developed on Pleistocene till	Hogue, John B.	Geosciences	Geosciences	M.S.	1996	Rose, Arthur
Crustal structure of the East African Plateau from receiver functions and Rayleigh wave phase velocity dispersion	Last, Robert J.	Geosciences	Geosciences	M.S.	1996	Nyblade, Andrew
Global vegetation patterns, past and present, as predicted by the Genesis climate model	Mangan, Jennifer M.	Geosciences	Geosciences	M.S.	1996	Barron, Eric
The geology and mineralogy of a cretaceous bentonite deposit in Saskatchewan Canada	Miller, Susan H.	Geosciences	Geosciences	M.S.	1996	Smith, Deane
The hydrogeochemical behavior of wastewater-derived nutrient elements in the groundwaters of Long Key, Florida	Monaghan, Lea B.	Geosciences	Geosciences	M.S.	1996	Kump, Lee
The late holocene volcanic stratigraphy of the Tetimpa area, northeast flank of Popocatepetl Volcano, Central Mexico	Panfil, Maria Stiritz	Geosciences	Geosciences	M.S.	1996	Gardner, Thomas
The utilization of bacterial sulfate reduction for the in-situ abatement of acid mine drainage using waste organic matter	Stalker, Jeralee	Geosciences	Geosciences	M.S.	1996	Rose, Arthur
Analysis of heat, oxygen, carbon dioxide, and water budget in the interpretation of acid mine drainage production in a lime inhibited demonstration coal mine, Clearfield County, Pennsylvania	Wilson, Kevin Randall	Geosciences	Geosciences	M.S.	1996	Parizek, Richard
Teleseismic waveform analysis of a deep crustal earthquake associated with the Rukwa Graben, Tanzania	Zhao, Ming	Geosciences	Geosciences	M.S.	1996	Langston, Charles
The Geology and Mineralogy of a Cretaceous Bentonite Deposit in Saskatchewan, Canada	Miller, Susan	GPHYS	Geosciences	M.S.	1996	Smith, Deane
Application and comparison of EPA wellhead protection delineation methods for karst aquifers, Centre County, Pennsylvania	Chin, Chi-Van	Geosciences	Geosciences	Ph.D.	1996	Parizek, Richard
Municipal sludge use in coal mine reclamation and potential effects on the formation of acidic mine drainage	Cravotta, Charles Angelo	Geochemistry and Mineralogy	Geochemistry and Mineralogy	Ph.D.	1996	Deines, Peter
Glaciation, chemical weathering, and the carbon cycle	Gibbs, Mark T.	Geosciences	Geosciences	Ph.D.	1996	Kump, Lee
A fully coupled model for saturated-unsaturated fluid flow in deformable porous and fractured media	Kim, Jun-Mo	Geosciences	Geosciences	Ph.D.	1996	Parizek, Richard
New methods in quantitative metamorphic petrology : 1.In situ determination of iron valence in minerals : 2.Application of 3-D textural analysis to the study of crystallization kinetics	Raeburn, Stuart P.	Geosciences	Geosciences	Ph.D.	1996	Kerrick, Darrill
Optimal reductions in CO^2 emissions	Schultz, Peter A.	Geosciences	Geosciences	Ph.D.	1996	Kasting, Andrew
Nonlinear regression modeling and forecasting of accelerating slope deformation	Sousa, James	Geosciences	Geosciences	Ph.D.	1996	Voight, Barry
Modeling the large-scale interaction of climate, tectonics, and topography	Tucker, Gregory E.	Geosciences	Geosciences	Ph.D.	1996	Slingerland, Rudy

Fracture distribution in faulted basement blocks, Gulf of Suez, Egypt : reservoir characterization and tectonic implications	Younes, Amgad Ibrahim	Geosciences	Geosciences	Ph.D.	1996	Engelder, Terry
The significance of megacrysts and xenocrysts in the tonoma kimberlite dikes	Borella, Maxwell W.	Geosciences	Geosciences	B.S.	1997	Unknown
Composition and structure of the Heart Mountains glide plane at White Mountain, Sunlight Basin, Wyoming	Dudash, Jonna Lynn	Geosciences	Geosciences	B.S.	1997	Unknown
The use of seismic and direct observations to study the shallow groundwater flow regime at a USDA site along Spring Creek, Hershey, PA.	Falkenstern, David M.	Geosciences	Geosciences	B.S.	1997	Alexander, Shelton S.
The impacts of the 1986 Safe Drinking Water Act Amendments on vulnerability to climatic variation and change : a case study on the central Clinton County Water System	Glassberg, Mary Lee	Earth sciences	Earth sciences	B.S.	1997	Unknown
Joint spacing statistics in thick, homogeneous shales of the Catskill Delta complex on the Appalachian plateau, Finger Lakes region, New York	Hagin, Paul N.	Geosciences	Geosciences	B.S.	1997	Unknown
Analysis of trace elements for determining the stability of calcite and aragonite	Harm, J. Eian	Geosciences	Geosciences	B.S.	1997	Unknown
Identification and distribution of reef-building bryozoan species in the ullin and Warsaw limestones of the southernmost Illinois basin	Heasley, Amanda Marie	Geosciences	Geosciences	B.S.	1997	Unknown
The water quality in karst terrane in the Cumberland Valley, Cumberland County, Pennsylvania	Heine, Leah Somers	Geosciences	Geosciences	B.S.	1997	Unknown
Modeling the basal water beneath the Siple Coast region of the west Antarctic ice sheet	Hile, James Michael	Geosciences	Geosciences	B.S.	1997	Unknown
Three-dimensional upper crustal structure of the San Francisco Bay area: velocity models	Horta, Elba	Geosciences	Geosciences	B.S.	1997	Unknown
Coupled radiative/photochemical modeling of atmospheric O3 as a function of O2	Justh, Hilary L.	Earth sciences	Earth sciences	B.S.	1997	Unknown
Changes in mesozoic forests	Kawakita, Kazuhiro	Geosciences	Geosciences	B.S.	1997	Unknown
The role of flexural slip during the formation of folds in devonian clastic rocks of the Appalachian plateau	Latta, Diana K.	Geosciences	Geosciences	B.S.	1997	Unknown
Pesticide, molecular and isotopic profiles of Green Lake sediments, Fayetteville, New York	Laukonen, Kathryn A.	Geosciences	Geosciences	B.S.	1997	Unknown
A fracture analysis of the Ashdown Gorge region	McCann, Chris M.	Geosciences	Geosciences	B.S.	1997	Unknown
Seismic data analysis of the town enclave and temple district at Hierakonplis Egypt.	Montague, M.	Geology	Geology	B.S.	1997	Unknown
Thermal modeling of the Marcy Anorthosite Massif, Adirondack Mountains, New York: implications for genvillian Adirondack metamorphic, magmatic and tectonic history and depthy of emplacement	Myer, Kevin M.	Geosciences	Geosciences	B.S.	1997	Unknown
Depositional environments and stratigraphic framework of the late devonian 3rd and 4th Elk Reservoir sands in central Pennsylvania	Panettieri, Michael W.	Geosciences	Geosciences	B.S.	1997	Unknown

Analysis of joint and vein spacing in the Brallier Formation, Huntingdon, PA	Ruf, Jason C.	Geosciences	Geosciences	B.S.	1997	Unknown
Shale compaction as a result of geopressures in the south Timbalier region of the Gulf Coast	Shatt, Ryan A.	Geosciences	Geosciences	B.S.	1997	Unknown
Topographic modeling of Maxwell montes: implocation for venusian tectonics and crustal strength	Sunderman, Cobin	Geosciences	Geosciences	B.S.	1997	Unknown
Use of seismic methods to search for fossil channels of the Nile River, Nekhen, Egypt	Vasalani, Jack L.	Geosciences	Geosciences	B.S.	1997	Alexander, Shelton S.
Absorption of heavy metals by manganese oxides in caves	Vito, Carmen M.	Geosciences	Geosciences	B.S.	1997	Unknown
Time-lapse seismic monitoring of the South Timbalier block 295 field, offshore Louisiana	Burkhart, Tucker	Geosciences	Geosciences	M.S.	1997	Flemings, Peter
GIS-based seismic hazard assessment around the city of Izmir in Western Turkey	Cakir, Recep	Geosciences	Geosciences	M.S.	1997	Alexander, Shelton S.
Reservoir and production characteristics of the South Timbalier 295 Field, offshore Louisiana, with comparison to outcrop analogue and 4-D seismic results	Hoover, Andrew R.	Geosciences	Geosciences	M.S.	1997	Flemings, Peter
Joint initiation and propagation in the devonian rocks of the Appalachian Plateau	McConaughy, David Terrell	Geosciences	Geosciences	M.S.	1997	Engelder, Terry
Temporal evolution of feldspar surfaces during the initial stages of in-situ weathering	Nugent, Melissa	Geosciences	Geosciences	M.S.	1997	Brantley, Susan
Thermal-mechanical modeling of Andean orogenesis by ablative subduction	Pope, Daniel C.	Geosciences	Geosciences	M.S.	1997	Willett, Sean
Thermal modeling of the lithosphere of the northern Aegean, Greece	Tzetos, Nikolaos	Geosciences	Geosciences	M.S.	1997	Furlong, Kevin
An investigation of early eocene deep water warmth using uncoupled atmosphere and ocean general circulation models : model sensitivity to geography, initial temperatures, atmospheric forcing and continental runoff	Bice, Karen L.	Geosciences	Geosciences	Ph.D.	1997	Barron, Eric
Temperature-and pH-dependence of silicate dissolution rate at acid pH	Chen, Yang	Geosciences	Geosciences	Ph.D.	1997	Brantley, Susan
Quantitative characterization and modeling of lithologic heterogeneity	Deshpande, Anil	Geosciences	Geosciences	Ph.D.	1997	Flemings, Peter
Volcanology and geochemistry of pliocene and quaternary basalts on Citadel Mountain, Lunar Crater Volcanic field, Pancake Range, Nevada	Dickson, Loretta Darlene	Geology	Geology	Ph.D.	1997	Unknown
The geology, petrology, and geochemistry of ultramafic igneous rocks from Porcupine Dome and Grassrange, central Montana	Doden, Arnold Gabriel	Geosciences	Geosciences	Ph.D.	1997	Gold, David
The formation of organic sulfides by reaction of lipids with aqueous sulfides in three holocene sediments	Filley, Timothy Raymond	Geosciences	Geosciences	Ph.D.	1997	Hatcher, Patrick
Sulfur isotope geochemistry of the Archean sedimentary rocks	Kakegawa, Takeshi	Geosciences	Geosciences	Ph.D.	1997	Ohmoto, Hiroshi
Formation and maintenance of hydraulic habitat units in streams of the Ozark plateaus, Missouri and Arkansas	McKenney, Rose A.	Geosciences	Geosciences	Ph.D.	1997	Gardner, Thomas
Controls on porosity and permeability in fracture-flow and conduit-flow (Karst) rocks of the Knox Group, southern Appalachian fold-and-thrust belt, Alabama, U.S.A	Redwine, James C.	Geology	Geology	Ph.D.	1997	Parizek, Richard

The origin and significance of grain-size trends in ancient fluvial deposits	Robinson, Ruth A.J.	Geosciences	Geosciences	Ph.D.	1997	Slingerland, Rudy
Abrupt Climate Changes and the Effects of North Atlantic Deepwater Formation: Results from the Genesis Global Climate Model and Comparison with Data from the Younger Dryas Event and the Event at 8200 Years BP and the Present	Agustsdottir, Anna	GEOSC	Geosciences	Ph.D.	1997	Alley, Richard
Reef-building bryozoan species of the bland bryozoan reef (middle ordovician, southwestern Virginia) bryoherm growth on the top of a deep regional bank	Ansara, Stephen L.	Earth sciences	Earth sciences	B.S.	1998	Unknown
An investigation of the depositional environment of the basal bradford sandstone to determine the placement of new gas wells	Carpenetti, Edward J.	Geosciences	Geosciences	B.S.	1998	Unknown
Strain analysis on the Rosehill Formation using paleontological strain indicators near Whipple Dam, Pennsylvania	Cooper, D. (Daniel)	Geosciences	Geosciences	B.S.	1998	Unknown
A model of horizontal crack growth as a rate-limiting process in glacier erosion	Creyts, Timothy T.	Geosciences	Geosciences	B.S.	1998	Unknown
A model of horizontal fracture propagation as a rate-limiting process in glacier erosion	Creyts, Timothy T.	Geosciences	Geosciences	B.S.	1998	Unknown
Elastic properties of synthetic olivine and perovskite aggregates	Ehrlich, Melissa R.	Geophysics	Geophysics	B.S.	1998	Unknown
Search for fossil meteorites	Henry, Richard C.	Geosciences	Geosciences	B.S.	1998	Unknown
Earthquake hazards of Central and Eastern United States, Particularly Pennsylvania, and the GIS based approach to mapping site amplification factors	Hughes, Edward J.	Earth Sciences	Earth Sciences	B.S.	1998	Alexander, Shelton S.
The effect of lithology on the persistence of joint orientations through marine to fluvial depositional environments in the Catskill Delta near Port Matilda, PA	Kovach, Megan M.	Geosciences	Geosciences	B.S.	1998	Unknown
A study of the hydrology/hydrogeology of the Tyrone forge quarry holdings, Huntingdon County, Pennsylvania	Kronenwetter, Jason K.	Geosciences	Geosciences	B.S.	1998	Unknown
Textural analysis of the directed blast deposits from Bezymianny volcano, Kamchatka, Russia	Lippman, Todd K.	Geosciences	Geosciences	B.S.	1998	Unknown
Characterization of upper-mantle velocities in the Rukwa Rift region	McIlhenny, Andrew S.	Geosciences	Geosciences	B.S.	1998	Unknown
Effects of elevated carbon dioxide levels on pH and saturation state of calcium carbonate in surface seawater	Mehalchick, Karoline	Geosciences	Geosciences	B.S.	1998	Unknown
Relationship between pyrite surface features and morphology	Owsley, Amy Marie	Earth sciences	Earth sciences	B.S.	1998	Unknown
Paleoseasonality on an early maastrichtian shelf on the basis of stable isotopic compositions of calcereous macrofossils	Pinkus, David S.	Geosciences	Geosciences	B.S.	1998	Unknown
Data modeling of the early cretaceous : a comparitive [sic] study of ice rafted dropstones and average temperature	Rogers, David L.	Earth sciences	Earth sciences	B.S.	1998	Unknown
Data modeling of the early cretaceous: a comparitive study of ice rafted dropstones and average temperature	Rogers, David L.	Earth Science	Earth Science	B.S.	1998	Eric Barron

A faunal assemblage comparison study of late cretaceous formations in North Carolina and New Jersey	Ross, Marcus R.	Earth Science	Earth Science	B.S.	1998	Unknown
Construction of a five foot spent mushroom substrate (SMS) leachate column and subsequent analysis of collected leachate	Rybacki, Jonathan M.	Geosciences	Geosciences	B.S.	1998	Unknown
Bryozoan and coral species in the Covington bryozoan reef (Chazyan, west-central Virginia)	Savill, Andrew C.	Geosciences	Geosciences	B.S.	1998	Unknown
Mineralogy of iron precipitates associated with acid mine drainage in Pennsylvania	Schray, Anne M.	Geosciences	Geosciences	B.S.	1998	Unknown
A hydrogeologic study of a conduit system in Sinking Valley, Blair County, Pennsylvania	Schwede, Sara B.	Geosciences	Geosciences	B.S.	1998	Unknown
Tidal fluctuations in Long Key, Florida: use in determining aquifer characteristics	Scott, Eileen A.	Geosciences	Geosciences	B.S.	1998	Unknown
Investigation of induced and natural streambed infiltration in the vicinity of the Pennsylvania State University's Houserville well field, Centre, County, PA	Steele, Scott W.	Geosciences	Geosciences	B.S.	1998	Unknown
The composition of the upper mantle and properties of teh 400 km discontinuity between various tectonic regions	Stiles, Jesse	Earth sciences	Earth sciences	B.S.	1998	Unknown
Characterization of the K16 sand using well log, production and seismic data, South Timbalier 295 Field, offshore Louisiana	Walsh, Patrick	Geosciences	Geosciences	B.S.	1998	Unknown
Analysis of weathering rinds as a method for dating Costa Rican river terraces	Wise, Joy	Geosciences	Geosciences	B.S.	1998	Unknown
The Miocene radiation of grasslands : compound-specific isotope evidence from organic matter from the Indian subcontinent	Colarusso, Lee Ann	Geosciences	Geosciences	M.S.	1998	Freeman, Katherine
Global comparison of Late Aptian climate simulations with the geologic record : an investigation of the glendonite record for cold Australian climate	De Lurio, Jennifer Lynn	Geosciences	Geosciences	M.S.	1998	Barron, Eric
Formation of the Sage breccia pipe by solution and collapse processes, Coconino County, Arizona	Gardner, Ken S.	Geosciences	Geosciences	M.S.	1998	Gold, David
Illuminating basinal fluid flow in Eugene Island 330 (Gulf of Mexico) through in situ observations, deformation experiments, and hydrodynamic modeling	Stump, Beth Bishop	Geosciences	Geosciences	M.S.	1998	Flemings, Peter
Ice sheet effects on receiver functions and crustal structure of west Antarctica	Yoo, Seung C.	Geosciences	Geosciences	M.S.	1998	Langston, Charles
Abrupt climate changes and the effects of North Atlantic deepwater formation : results from the Genesis global climate model and comparison with data from the Younger Dryas event and the event at 8200 years BP and the present	Agustsdóttir, Anna María	Geosciences	Geosciences	Ph.D.	1998	Alley, Richard
A management model for the Saq aquifer in Tabuk City, Saudi Arabia	AL-Zarah, Abdullah Ibrahim	Geosciences	Geosciences	Ph.D.	1998	Parizek, Richard

High temperature deformation of clinopyroxene and clinopyroxene-plagioclase aggregates	Bystricky, Michal J.	Geosciences	Geosciences	Ph.D.	1998	Mackwell, Stephen
FracFlow96 : a numerical model for simulating multiphase fluid flow in fractured porous media with an application at Yucca Mountain, Nevada	Diodato, David Michael	Geosciences	Geosciences	Ph.D.	1998	Parizek, Richard
High temperature creep of synthetic olivine-enstatite aggregates	Lawlis, Jeffrey D.	Geosciences	Geosciences	Ph.D.	1998	Mackwell, Stephen
Miocene atmospheric carbon dioxide concentrations and paleoceanography : constraints from compound-specific carbon-isotope compositions	Pagani, Mark	Geosciences	Geosciences	Ph.D.	1998	Arthur, Michael
Organic carbon-isotopes as indicators of paleoclimate : the impact of organic matter source variations	Pancost, Richard D.	Geosciences	Geosciences	Ph.D.	1998	Freeman, Katherine
Sulfur diagenesis in holocene Peru shelf and slope sediments	Suits, Neil S.	Geosciences	Geosciences	Ph.D.	1998	Arthur, Michael
Southern Africa seismic structure and source studies	Zhao, Ming	Geosciences	Geosciences	Ph.D.	1998	Langston, Charles
Controls on pyrite formation in modern salt marsh sediment, Chincoteague Bay, Virginia	Belicka, Laura L.	Geosciences	Geosciences	B.S.	1999	Unknown
Plio-pleistocene diversity and turnover patterns of tropical American planktonic foraminifera	Bezusko, Karen M.	Geosciences	Geosciences	B.S.	1999	Unknown
Seismic imaging of groundwater levels at Hierakonpolis Egypt archaeological site	Brown, S.M.	Geology	Geology	B.S.	1999	Unknown
Slope-area dependence of long stream profiles in the western central range of Taiwan	Campitelli, Thomas	Geosciences	Geosciences	B.S.	1999	Unknown
Prediction and characterization of overpressure using reflection seismic interval velocities compared with wireline results, south timbalier block 295, offshore Louisiana	Comisky, Joseph T.	Geosciences	Geosciences	B.S.	1999	Unknown
Predictions of the structure of the Venusian interior from compositional models	Gorman, P. J.	Geosciences	Geosciences	B.S.	1999	Unknown
Origins of slip along systematic cross-fold joints in the Genesee Group of the Finger Lakes district, New York	Haith, Benjamin F.	Geosciences	Geosciences	B.S.	1999	Unknown
An analysis of weather- and earthquake-related landsliding in Anaheim and Peralta Hills, Anaheim, California	Kompanik, Kristy L.	Geosciences	Geosciences	B.S.	1999	Unknown
Seismic imaging of the perimeter walls at Hierakonpolis, Egypt Archeological site	Kozic, Jeffery R.	Geosciences	Geosciences	B.S.	1999	Alexander, Shelton S.
Trishear deformation modeling of fault propagation folds from the eastern Ebro Basin, Spain	Krugh, William C.	Geosciences	Geosciences	B.S.	1999	Unknown
The effect of subglacial water pressure variability on erosion and water flux	Kwan, Joslin C.	Geosciences	Geosciences	B.S.	1999	Unknown
Open limestone channels: a strategy to remediate acid mine drainage in southwestern Pennsylvania	Lourenso, Fara J.	Geosciences	Geosciences	B.S.	1999	Unknown
Geology of the union furnace area, huntingdon and blair counties. Pennsylvania	Malik III, Peter A.	Earth Science	Earth Science	B.S.	1999	Gold, David P.

A model of Jupiter II, Europa: possibilities for a subsurface ocean	Martinka, Sandra Ann	Geosciences	Geosciences	B.S.	1999	Unknown
Primary bryozoan and coral reef builders of the shallow-water bryozoan reef at Dickensonville, Virginia	McClain, Marc D.	Earth sciences	Earth sciences	B.S.	1999	Unknown
Probability of wetland occurrence characterized by geology, slope, and stream link number Spring Creek, White Deer Creek and Juniata Watersheds, Pennsylvania	McLaughlin, Karen	Geosciences	Geosciences	B.S.	1999	Unknown
Relationship between glaciation and volcanism in the quaternary	Mirigliano, Michelle Elizabe	Geosciences	Geosciences	B.S.	1999	Unknown
Paleoenvironmental records from two sites in Mesoamerica: evidence of vegetation shifts since the last glacial maximum	Moreland, Michael A.	Geosciences	Geosciences	B.S.	1999	Unknown
The effects of the nickel ion and fulvic acid in calcite precipitation	Ritchey, Barry G.	Geosciences	Geosciences	B.S.	1999	Unknown
A risk analysis of solar flares and geomagnetic storms on satellites, the global positioning system, and electric power transmission systems	Rudalavage, Paul A.	Geosciences	Geosciences	B.S.	1999	Unknown
Controls on travertine deposition in central Italy	Smoley, Megan E.	Geosciences	Geosciences	B.S.	1999	Unknown
Flood and drought cycles in the Susquehanna River basin the future implications of global climate change on the Susqyehanna River basin	Snyder, Bridget Renee	Earth sciences	Earth sciences	B.S.	1999	Unknown
A field-based study of channel initiation	Stolar, Drew B.	Geosciences	Geosciences	B.S.	1999	Unknown
The origin and characteristics of natural levees	Adams, Peter Nelson	Geosciences	Geosciences	M.S.	1999	Slingerland, Rudy
Late Cenozoic tectonic evolution of the Kyrgyz Range and adjoining Chu Basin : new age constraints from fission-track, (U-TH)/HE, and magnetostratigraphy	Bullen, Michael E.	Geosciences	Geosciences	M.S.	1999	Burbank, Douglas
Wind-driven circulation on the continental shelf : its role in sediment transport and shelf morphology	Cookman, Janette Lyn	Geosciences	Geosciences	M.S.	1999	Flemings, Peter
The fate of wastewater phosphate in saline carbonate groundwater : Key Colony Beach, Florida	Elliott, Katherine	Geosciences	Geosciences	M.S.	1999	Kump, Lee
Modeling Chesapeake Bay salinity and phytoplankton dynamics in response to varying climate	Gibson, Jody Russell	Geosciences	Geosciences	M.S.	1999	Najjar, Ray
An integrated assessment of regional sediment pathways in the Susquehanna River Basin on decadal to centennial time-scales	Gordon, Sara Jean	Geosciences	Geosciences	M.S.	1999	Barros, Ana
Upper mantle seismic velocity structure of the Afar region	Knox, Ronald P.	Geosciences	Geosciences	M.S.	1999	Nyblade, Andrew
Integration of seismic, log, and core data for late Miocene to Pleistocene sequences at the New Jersey outer continental shelf (ODP LEG 174A, sites 1071 and 1072)	Metzger, John Marshall	Geosciences	Geosciences	M.S.	1999	Flemings, Peter
Landscape evolution and structure of the Pacific Coast, Costa Rica	Sak, Peter Benjamin	Geosciences	Geosciences	M.S.	1999	Fisher, Donald
Regional and fold-parallel joint distribution at split mountain Anticline, Utah : study of the relationship between joint development and 2-D curvature in Laramide folds	Silliphant, Laura JoAnn	Geosciences	Geosciences	M.S.	1999	Engelder, Terry
Sedimentology and stable-isotope chemostratigraphy of late middle ordovician carbonates in central Pennsylvania	Slupik, Leta Magendanz	Geosciences	Geosciences	M.S.	1999	Patzkowsky, Mark

Polar firn densification : developing a forward model	Spencer, Matthew Keith	Geosciences	Geosciences	M.S.	1999	Alley, Richard
Assessment of the hydrogeologic regime for the New Enterprise Quarry at Roaring Spring, Pennsylvania	Sucher, Richard D.	Geosciences	Geosciences	M.S.	1999	Parizek, Richard and David Gold
CO^2 emissions in Yellowstone National Park, U.S.A. : statistical sampling, total degassing, and transport mechanisms	Werner, Cynthia Anne	Geosciences	Geosciences	M.S.	1999	Brantley, Susan
Dissolution kinetics of feldspar in the Cape Cod aquifer, Massachusetts : calculation of ground water residence times	Yau, Simmy	Geosciences	Geosciences	M.S.	1999	Brantley, Susan
Investigation of the dependence of earthquake source depth on magnitude in eastern North America	Zamani, Ataollah	Geosciences	Geosciences	M.S.	1999	Alexander, Shelton
Numerical models of reducing primitive atmospheres on Earth and Mars	Brown, Lisa Lynne	Geosciences	Geosciences	Ph.D.	1999	Kasting, James
The mid-Cretaceous ocean circulation and its impact on greenhouse climate dynamics	Poulsen, Christopher James	Geosciences	Geosciences	Ph.D.	1999	Barron, Eric
Chemical weathering in watersheds : theoretical and field studies in the Mahantango creek and Susquehanna river basins, Pennsylvania	Richards, Paul James Liddell	Geosciences	Geosciences	Ph.D.	1999	Kump, Lee and Susan Brantley
Interpretation, modeling and forecasting runoff of regional hydrogeologic systems	Shun, Tongying	Geosciences	Geosciences	Ph.D.	1999	Duffey, Christopher (Civil Engineering)
Organic complexes of zinc and lead isotope distributions in the upper Mississippi valley zinc-lead district	Sicree, Andrew Alexander	Geochemistry and Mineralogy	Geochemistry and Mineralogy	Ph.D.	1999	Barnes, Hubert
A sequence stratigraphic and geochemical investigation of lower to middle Turonian (Cretaceous) strata of the Western Interior Seaway, Utah, Colorado, and Western Kansas	White, Timothy S.	Geosciences	Geosciences	Ph.D.	1999	Arthur, Michael
Investigation of prominent shallow seismic reflectors at Hierakonpolis, an ancient archaeological site in southern Egypt	Bosshart, Robert Perry	Geosciences	Geosciences	B.S.	2000	Unknown
Air convection in near-surface snow on ice sheets	Johnston, Todd	Geosciences, Meteorology	Geosciences	B.S.	2000	Richard B. Alley
Factors controlling the formation of solution cavities, using data taken from core borings of the proposed I-99 project, Centre County, Pennsylvania	Koch, Erin A.	Geosciences	Geosciences	B.S.	2000	Unknown
Role of soil bacteria, azotobacter vinelandii, in release of Fe, Mo, and Ni from minerals	Leist, Laura E.	Geosciences	Geosciences	B.S.	2000	Susan L. Brantley
A detailed study of sulfur cycling across the chemocline of Green Lake, Fayetteville, New York	Lottig, Justin Herman	Geosciences	Geosciences	B.S.	2000	Unknown
Tree-ring chronologies as records of climate variability in Central Pennsylvania	Paden, David E.	Earth sciences	Earth sciences	B.S.	2000	Unknown
Water table variations detected by shallow seismic refraction at Hierakonpolis Egypt.	Salafrio, K.	Geology	Geology	B.S.	2000	Unknown
Ice fabric and active seismology : an investigation and interpretation of central West antarctica	Burkett, Peter G.	Geosciences	Geosciences	M.S.	2000	Alley, Richard

Measurements of gasses trapped in a South American ice core : paleoatmospheric composition and inferred microbial activity	Campen, Richard Kramer	Geosciences	Geosciences	M.S.	2000	Sowers, Todd
Strain histories from the Eastern Central Range of Taiwan	Greenan, Shannon L.	Geosciences	Geosciences	M.S.	2000	Fisher, Donald M.
The fate of wastewater-derived nitrate in the subsurface of the Florida Keys : Key Colony Beach Florida	Griggs, Erin M.	Geosciences	Geosciences	M.S.	2000	Kump, Lee R.
Thermal-petrologic response of the northern California crust to triple junction migration	Guzofski, Chris A.	Geosciences	Geosciences	M.S.	2000	Furlong, Kevin P.
A 106,000 year N_2O record from the gisp II ice core	Jubenville, Jennifer J.	Geosciences	Geosciences	M.S.	2000	Sowers, Todd
Spatial and temporal variability in methane flux from a temperate salt marsh : chincoteague Bay, VA	Matlack, Erin M.	Geosciences	Geosciences	M.S.	2000	Arthur, Michael
Evolution of surface roughness with aqueous corrosion of alkali and alkaline-earth aluminosilicate minerals and glasses	Mellott, Nathan Petteys	Geosciences	Geosciences	M.S.	2000	Brantley, Susan L.
Methods for determining wetland recharge sources in the vicinity of a wastewater irrigation site	O'Driscoll, Michael Anthony	Geosciences	Geosciences	M.S.	2000	Parizek, Richard
Thermomechanical flowline model for studying the interactions between ice sheets and the global climate system	Parizek, Byron R.	Geosciences	Geosciences	M.S.	2000	Alley, Richard
Nitrate Removal Efficiencies: Overland Flow Versus Wetland Systems Receiving Secondary Sewage Effluent at Penn State's Living Filter Project	Nemitz, Jennifer	GEOSC	Geosciences	M.S.	2000	Parizek, Richard
Stable carbon-isotope geochemistry of low-molecular weight organic acids in oil-associated waters	Dias, Robert F.	Geosciences	Geosciences	Ph.D.	2000	Freeman, Katherine
Life's influence on the sedimentary record : the interplay of ocean chemistry, circulation, and the biological pump	Hotinski, Roberta Michelle	Geosciences	Geosciences	Ph.D.	2000	Kump, Lee R.
Active tectonics and quaternary landscape evolution across the western Panama block, Costa Rica, Central America	Marshall, Jeffrey S.	Geosciences	Geosciences	Ph.D.	2000	Fisher, Donald M. and Thomas W. Gardner
Testing for a relationship between paleocommunity recurrence and taxonomic turnover using a sequence stratigraphic framework [electronic resource]	Olszewski, Thomas D.	Geosciences	Geosciences	Ph.D.	2000	Patzkowsky, Mark E.
A new tectonic model for the Appalachian plateau detachment sheet of southwestern Pennsylvania	Scanlin, Michael A.	Geosciences	Geosciences	Ph.D.	2000	Engelder, Terry
Stable isotope analysis of travertine Hot Springs, Bridgeport, CA	Acker, Vicki A.	Geosciences	Geosciences	B.S.	2001	Unknown
Constraints on the structure of the Fila Coste a fold and thrust belt based on low temperature termochronometry Pacific Coast, Costa Rica	Arthur, James R.	Geosciences	Geosciences	B.S.	2001	Unknown
AFM investigations of pitting on silicate surfaces by a soil bacterium	Buss, Heather L.	Geosciences	Geosciences	B.S.	2001	Susan L. Brantley
Magmatic processes at merapi volcano, Central Java, Indonesia, deduced from petrologic, chemical and textural analyses of dome lavas	Cooper, Lauren B.	Geosciences	Geosciences	B.S.	2001	Unknown

Modeling strike-slip faults : numerical study of a transform boundary applied to the Hayward Fault, CA and structural study of a rifting margin, Kalya Ridge, Lake Tanganyika, East Africa	Gans, Christine R.	Geosciences	Geosciences	B.S.	2001	Kevin P. Furlong
Vulnerability to climate change in Cape May County, New Jersey : resident perceptions	Kilroy, Jenna L.	Geosciences, Earth sciences	Geosciences	B.S.	2001	Brent Yarnal
Characterizing shallow subsurface seismic anomalies at Hierakonpolis, Egypt	Llewellyn, Garth Thomas	Geosciences	Geosciences	B.S.	2001	Unknown
Using dye tracers to delineate flow patterns through two karst basins : Kooken Cave, Huntingdon County and Tytoona Cave, Blair County, PA	McCarthy, Sandra C.	Geosciences	Geosciences	B.S.	2001	Unknown
Relative age of a smaller-scale joint set formed between large-scale joint zones in the Navajo sandstone at Zion National Park, Utah : analysis based on joint spacing statistics and joint interaction	Myers, Douglas A.	Geosciences	Geosciences	B.S.	2001	Unknown
Isotopic and elemental gas analyses from the Moulton ice core spanning the Eemian period	Noble, Clint C.	Geosciences	Geosciences	B.S.	2001	Unknown
Petrogeneses of sulfur and sulfur volcanism on Jupiter's moon Io	Thompson, Matthew Alexa	Geosciences	Geosciences	B.S.	2001	Unknown
The origin of anastomosis in the upper Columbia River, British Columbia, Canada	Abbado, Dimitri	Geosciences	Geosciences	M.S.	2001	Slingerland, Rudy L.
Modeling European vegetation and permafrost during oxygen isotope stage three	Alfano, Mary Jo	Geosciences	Geosciences	M.S.	2001	Barron, Eric
Baseflow geochemistry of a fluviokarst watershed : Burd Run, south-central Pennsylvania	Grote, Todd D.	Geology	Geology	M.S.	2001	Unknown
Fe release and isotopic fractionation during dissolution of solid substrates in the presence of soil bacteria and organic ligands	Guynn, Robin Lee	Geosciences	Geosciences	M.S.	2001	Brantley, Susan L.
Time-lapse (4D) seismic investigation of the I3 and TA2 sands, kilauea field, green canyon block 6, Gulf of Mexico	Kaleta, Nathan	Geosciences	Geosciences	M.S.	2001	Flemings, Peter B.
Mapping the subsurface structure of the Tecopa Basin, California using gravity and magnetic data	Keohane, Meghan E.	Geosciences	Geosciences	M.S.	2001	Langston, Charlas A.
Tertiary Chemical Structure of the Afar Mantle Plume: Evidence From Primitive Mafic Lavas from Turkana, N. Kenya	Knight, Kelly M.	Geoscience	Geoscience	M.S.	2001	Furman, Tanya
Phyllolepids from Red Hill (placodermi, Devonian, Pennsylvania)	Lane, Jennifer A.	Geosciences	Geosciences	M.S.	2001	Cuffey, Roger J.
Nitrate removal efficiencies : overland flow versus wetland systems receiving secondary sewage effluent at Penn State's living filter project	Nemitz, Jennifer L.	Geosciences	Geosciences	M.S.	2001	Parizek, Richard
Upper mantle anisotropy and the SKS receiver function	Parizek, Heather Hennessey	Geosciences	Geosciences	M.S.	2001	Langston, Charlas A.
Landscape Disequilibrium on 1,000 - 10,000 Year Scales Marsyandi River, Nepal, Central Himalaya	Pratt, Beth A.	Geoscience	Geoscience	M.S.	2001	Burbank, Douglas
Imaging drainage of turbidite reservoirs though time-lapse seismic analysis at Bullwinkle, Green Canyon Block 65, offshore Gulf of Mexico	Swanston, Alastair	Geosciences	Geosciences	M.S.	2001	Flemings, Peter B.

Geology of the lantern hill silicified fault zone near North Stonington, Conn., with integrated geochemistry and geochronology	Altamura, Robert James	Geosciences	Geosciences	Ph.D.	2001	Gold, David P.
Imaging and Modeling of Ground Penetrating Radar Array Data with Application to the Gulkana Glacier, Alaska	Moran, Mark L.	Geology	Geophysics	Ph.D.	2001	Greenfield, Roy
Detrital uraninite and the early earth's atmosphere : SIMS analyses of uraninite in the Elliot Lake District and the dissolution kinetics of natural uraninite [electronic resource]	Ono, Shuhei	Geosciences	Geosciences	Ph.D.	2001	Ohmoto, Hiroshi
Photochemistry and climate on the Archean earth	Pavlov, Alexander A.	Geosciences	Geosciences	Ph.D.	2001	Kasting, James F.
Effects of temperature and climate on chemical weathering in two contrasting high-rainfall mountainous catachments	Turner, Benjamin Francis	Geosciences	Geosciences	Ph.D.	2001	Brantley, Susan L.
Acid mine drainage remediation analysis at the C&K Old Forty Mine Site, Clarion, Pennsylvania	Achey, Elisabet T.	Geosciences	Geosciences	B.S.	2002	Unknown
In-situ fluorescence of speleothems	Ambrosius, Chad J.	Geosciences	Geosciences	B.S.	2002	Unknown
Analysis of drought monitoring observations of WE-38 subwatershed of East Mahantango Creek near Dalmatia, Northumberland County, Pennsylvania	Anthony, Jennifer L.	Geosciences	Geosciences	B.S.	2002	Unknown
The determination of pre-eruptive conditions through the analysis of dacite bomb samples from the Sugar Bowl blast event, Mount St. Helens, Washington	Balint, Vanessa L.	Geosciences	Geosciences	B.S.	2002	David Eggler, Barry Voight
The role of tectonically driven fluids in the formation of the ouachita fold and thrust belt : characterization and relative timing of quartz veins	Bobich, Jennifer K.	Geosciences	Geosciences	B.S.	2002	Unknown
Geochemical analysis of miocene basalts from the Western Escarpment of the Ethiopian Rift	Cahill, Sheri L.	Geosciences	Geosciences	B.S.	2002	Unknown
What hands-on learning projects can bring to the classroom : investigation of vadose zone properties in State College, Pennsylvania	Fisher, Jonathon M.	Geosciences	Geosciences	B.S.	2002	Unknown
Geochemical analysis of cretaceous basalts from the Island of Tortola, British Virgin Islands	Gehman, Kimberly J.	Geosciences	Geosciences	B.S.	2002	Unknown
Evolution of the Bezymianny volcano magma chamber, 1956-1997 : Kamchatka, Russia	Meyers, Kristen Cunningh	Geosciences	Geosciences	B.S.	2002	Voight, Barry
Earthquake hazard analysis of Santa Barbara and Goleta, California	Obarsky, Tracy	Geosciences	Geosciences	B.S.	2002	Kevin Furlong
Changes in stress fields around fault zones in Wellington, New Zealand	Schneider, Erica Jayne	Geosciences	Geosciences	B.S.	2002	Kevin Furlong
Fluid pressures in the Nankai Accretionary Prism : ocean drilling program sites 808, 1173, 1174, and 1177	Straub, Kyle M.	Geosciences	Geosciences	B.S.	2002	Unknown
A runoff model for the Yantra Basin of Bulgaria	Waryas, Karen A.	Earth sciences	Earth sciences	B.S.	2002	Knight, C. Gregory
A geophysical investigation of Cretaceous sediments in Pond Bank, PA	Watson, Timothy Daniel	Geosciences	Geosciences	B.S.	2002	Unknown
Petrophysical analysis and geologic model for the Bullwinkle J Sands with implications for time-lapse reservoir monitoring, Green Canyon Block 65, offshore Louisiana	Comisky, Joseph T.	Geosciences	Geosciences	M.S.	2002	Flemings, Peter B.

Investigation of ecosystem reponse to environmental changes through biomarker and stable isotope analysis	Foland, Melinda Jean	Geosciences	Geosciences	M.S.	2002	Freeman, Katherine H.
Numerical models of ancient and modern microbial mats	Herman, Ellen K.	Geosciences	Geosciences	M.S.	2002	Kump, Lee R.
The late Ordovician mass extinction and early silurian recovery : comparison between Laurentian and global diversity	Krug, Andrew Z.	Geosciences	Geosciences	M.S.	2002	Patzkowsky, Mark E.
The stable isotopic composition of nitrous oxide over the last century, derived froM.S.outh Pole firn air, as a proxy for the changing nitrous oxide budget	Rodebaugh, Amy L.	Geosciences	Geosciences	M.S.	2002	Sowers, Todd A.
The stable isotopic composition of nitrous oxide over the last century, derived from South Pole firn air, as a proxy for the changing nitrous oxide budget	Rodebaugh, Amy L.	Geosciences	Geosciences	M.S.	2002	Sowers, Todd A.
Kinematic implications and dynamic analysis of regularly spaced joint zones of the Navajo Sandstone, Zion National Park, Utah	Rogers, Christie M.	Geosciences	Geosciences	M.S.	2002	Engelder, Terry
Hydrogeological, three dimensional, numerical flow modeling of the Dublin Port Tunnel and region	Rooney, Tyrone O.	Geosciences	Geosciences	M.S.	2002	Parizek, Richard R.
Geodynamic setting of the explorer plate-results from gravity modeling	Schneider, Christopher M.	Geosciences	Geosciences	M.S.	2002	Furlong, Kevin
Evidence of a mantle wedge source for slab window volcanism in the northern California Coast Ranges	Whitlock, Jaime S.	Geosciences	Geosciences	M.S.	2002	Furlong, Kevin
Multi-phase fluid dynamics of pyroclastic phenomena	Clarke, Amanda Bachtell	Geosciences	Geosciences	Ph.D.	2002	Voight, Barry
A conceptual model of strath terrace formation	Formento-Trigilio, Merri Lisa	Geosciences	Geosciences	Ph.D.	2002	Slingerland, Rudy L.
Soil carbon dioxide flow associated with the San Andreas and Calaveras Faults, California	Lewicki, Jennifer L.	Geosciences	Geosciences	Ph.D.	2002	Brandley, Susan L.
Geopressure and flow focusing on the slope of the Gulf of Mexico, GC 65	Lupa, Jacek Andrzej	Geosciences	Geosciences	Ph.D.	2002	Flemings, Peter B.
Numerical models of the dynamics of lithospheric deformation at complex plate boundaries	Malservisi, Rocco	Geosciences	Geosciences	Ph.D.	2002	Furlong, Kevin
Active tectonics and landscape evolution inboard of subducting seafloor roughness : an investigation across the Costa Rican fore arc, Central America	Sak, Peter Benjamin	Geosciences	Geosciences	Ph.D.	2002	Fisher, Donald M.
Transport and storage of trace metals in a karst aquifer : an example from Fort Campbell, Kentucky	Vesper, Dorothy J.	Geosciences	Geosciences	Ph.D.	2002	White, William B.
The late Archean biosphere [electronic resource] :bimplications of organic and inorganic geochemistry of marine shales and terrestrial paleosols	Watanabe, Yumiko	Geosciences	Geosciences	Ph.D.	2002	Ohmoto, Hiroshi
CO_2 emissions in Yellowstone, USA, and Solfatara Volcano, Italy [electronic resource] : use of eddy covariance and mass flux modeling	Werner, Cynthia Anne	Geosciences	Geosciences	Ph.D.	2002	Brandley, Susan L.
Geochemistry of Archean-Paleoproterozoic black shales [electronic resource] : the early evolution of the atmosphere, oceans, and biosphere	Yamaguchi, Kosei	Geosciences	Geosciences	Ph.D.	2002	Ohmoto, Hiroshi

The isobaric temperature dependence of the elastic properties of orthoenstatite	Brenizer, Jon S.	Geosciences	Geosciences	B.S.	2003	Unknown
Computer simulations of the mid to late Cretaceous Period as it correlates to the location of ammonite and belemnite fossils in the present geologic record	Cawthern, Thomas R.	Geosciences	Geosciences	B.S.	2003	Unknown
Determining earth structure beneath the Tibetan Plateau using receiver functions	Diehl, Theresa M.	Geosciences	Geosciences	B.S.	2003	Charles Ammon
Investigation of temperature-and pressure-dependent illitization and frictional velocity-dependence of smectite	Johnson, Julie A.	Geosciences	Geosciences	B.S.	2003	Unknown
The effects of grain size distribution on permeability of ocean core samples from the Marion Plateau, Australia	Migyanka, Misty L.	Geosciences	Geosciences	B.S.	2003	Unknown
Determination of the physical conditions of the Bezymianny magma chamber, Kamchatka, Russia : 1956-1997	Owens, Lara B.	Geosciences	Geosciences	B.S.	2003	Unknown
The use of geologic cross-sections to evaluate the southward propagation of the tectonic shortening in the Western Foothills of Taiwan	Tittmann, Brian P. F.	Geosciences	Geosciences	B.S.	2003	Unknown
Short period surface-wave tomography beneath the central and eastern Tibetan Plateau	Arias, Eliana	Geosciences	Geosciences	M.S.	2003	Ammon, Charles J.
Volcanic hazard assessment Gunung Agung, Bali, Indonesia	Doust, Roeland	Geosciences	Geosciences	M.S.	2003	Furman, Tanya
Crustal structure in Ethiopia and Kenya from receiver function analysis	Dugda, Mulugeta Tuji	Geosciences	Geosciences	M.S.	2003	Nyblade, Andrew A.
The CH_4 greenhouse and anti-greenhouse effect on early Mars	Justh, Hilary Lynne	Geosciences	Geosciences	M.S.	2003	Kasting, James F.
Time-lapse impedance inversion at Popeye field, Offshore Gulf of Mexico	Lee, Tin-Wai	Geosciences	Geosciences	M.S.	2003	Flemings, Peter B.
Carbon isotope discrimination in marine diatoM.S.pecies	McRowe, Kenneth A.	Geosciences	Geosciences	M.S.	2003	Freeman, Katherine H.
Carbon isotope discrimination in marine diatom species	McRowe, Kenneth A.	Geosciences	Geosciences	M.S.	2003	Freeman, Katherine H.
Biogeochemical speciation of dissolved copper within Onondaga Lake, Syracuse, New York	Moreland, Michael A.	Geosciences	Geosciences	M.S.	2003	Kump, Lee R.
Mechanisms controlling rupture front geometries during joint propagation in layered clastic sediments	Savalli, Laura M.	Geosciences	Geosciences	M.S.	2003	Engelder, Terry
Reservoir pressure and sea floor venting : predicting trap integrity in a Gulf of Mexico deepwater turbidite minibasin	Seldon, Benjamin John	Geosciences	Geosciences	M.S.	2003	Flemings, Peter B.
Integrated time-lapse seismic analysis of the two G-sand facies, Popeye field, Offshore Gulf of Mexico	Strickland, Beth Yuvancic	Geosciences	Geosciences	M.S.	2003	Flemings, Peter B.
Seismicity and structure of the West Antarctic Rift system	Winberry, J. Paul	Geosciences	Geosciences	M.S.	2003	Anandakrishnan, Sridhar
An assessment of interactively coupled paleoclimate-vegetation models	Batra, Persaram O.	Geosciences	Geosciences	Ph.D.	2003	Barron, Eric J.
The kinetics of hydrogen diffusion in single crystal orthopyroxene	Carpenter, Susan J.	Geosciences	Geosciences	Ph.D.	2003	Mackwell, Stephen J.
West Antarctic ice sheet surface melting and Holocene climate variability	Das, Sarah Borsody	Geosciences	Geosciences	Ph.D.	2003	Alley, Richard B.
Hydrodynamics of the US mid-Atlantic continental slope, offshore New Jersey	Dugan, Brandon	Geosciences	Geosciences	Ph.D.	2003	Flemings, Peter B.

Middle miocene climate evolution in the specific realm [electronic resource]	Ennyu, Atsuhito	Geosciences	Geosciences	Ph.D.	2003	Arthur, Michael A.
Neoproterozoic sulfur isotopes, snowball Earth events and the evolution of microbial sulfur species [electronic resource]	Hurtgen, Matthew T.	Geosciences	Geosciences	Ph.D.	2003	Arthur, Michael A.
Aqueous and precipitate chemistry of coal mine drainage water in alkaline environments	Loop, Caroline M.	Geosciences	Geosciences	Ph.D.	2003	White, William B. and Barry E. Scheetz
Modeling the West Antarctic and Greenland Ice Sheets : new dynamic, thermodynamic, and isostatic insights	Parizek, Byron R.	Geosciences	Geosciences	Ph.D.	2003	Alley, Richard B.
Nonlinear paleoclimatology : reconstructions in West Antarctica	Reusch, David Bradshaw	Geosciences	Geosciences	Ph.D.	2003	Alley, Richard B.
Reconciling discrepancies between measured fault slip rates and GPS modeled fault slip rates in Owns Valley, CA	Bini, Aaron	Geosciences	Geosciences	B.S.	2004	Unknown
Reflection seismic data interpretation of Antarctic ice to determine fabric and structure	Conley, Randy D.	Geosciences	Geosciences	B.S.	2004	Unknown
Geology of the Asheom Quarry, Everett, Bedford County, Pennsylvania	Crowther, Nathan J.	Geosciences	Geosciences	B.S.	2004	Unknown
Mid-pleistocene sea surface temperatures in the Northwestern subtropical Atlantic	Fisler, Janine A.	Earth Science and Geosciences	Earth Science	B.S.	2004	Richard Alley
Digital leaf physiognomy : calibration and testing of a new paleothermometer using modern floras	Janesko, David	Geosciences	Geosciences	B.S.	2004	Unknown
Causes of asterism in an alkali feldspar from Kangayam, India	Johnson, Kelsey Patrice	Geosciences	Geosciences	B.S.	2004	Peter Heaney
Dimensionality in granular mechanics : the role of surface properties and material properties	Knuth, Matthew W.	Geosciences	Geosciences	B.S.	2004	Chris J. Marone
A vulnerability assessment of the Moshannon Creek Watershed, Pennsylvania	Knuth, Sarah E.	Earth sciences	Earth sciences	B.S.	2004	Yarnal, Brent
Concretions in the Llewellyn Formation, Bear Valley Strip Mine, Shamokin, Pa : rigid inclusions in a deformable matrix	McAleer, Ryan J.	Geosciences	Geosciences	B.S.	2004	Unknown
Analysis of finite strain markers to determine the kinematics of deformation in the Valley and Ridge Province of Pennsylvania	Miller, James Fargo	Geosciences	Geosciences	B.S.	2004	Unknown
Studying earthquake locations prior to the 1998 eruption at Merapi Volcano, Indonesia	Pearson, Sophie	Geosciences	Geosciences	B.S.	2004	Unknown
Occurrence and transport of selected pharmaceuticals and personal care product constituents in the vadose zone after wastewater irrigation at the Pennsylvania State University's gamelands sprayfields	Smidansky, Heidi M.	Geosciences, Biology	Geosciences	B.S.	2004	Richard R. Parizek
Using geographically distributed climate data as an estimate of past conditions for different continental configurations	Wilkes, Christopher Scott	Geosciences	Geosciences	B.S.	2004	Eric J. Barron
A laboratory study of frictional strength and stability of granular fault gouge	Anthony, Jennifer L.	Geosciences	Geosciences	M.S.	2004	Marone, Chris J.
Landscape evolution in the Rio Grande rift	Ault, Amanda Lynn	Geosciences	Geosciences	M.S.	2004	Burbank, W. Douglas
Ferric hydroxide formation in silica-rich solutions	Bazilevskaya, Ekaterina	Geosciences	Geosciences	M.S.	2004	Ohmoto, Hiroshi

Investigations of strike slip plate boundaries : numerical modeling of creeping faults in central California and spatial and temporal slip distribution in southern California	Gans, Christine R.	Geosciences	Geosciences	M.S.	2004	Furlong, Kevin P.
Effects of variable normal stress on shear strength and stability of granular fault gouge	Hong, Tiancong	Geosciences	Geosciences	M.S.	2004	Marone, Chris J.
Acquisition azimuth effects on seismic repeatability, and implications for seismic reservoir monitoring : a case study from the Bullwinkle Field,Green Canyon Block 65, offshore Louisiana	Janssen, Aaron L.	Geosciences	Geosciences	M.S.	2004	Flemings, Peter B.
Experimental constraints on pelite melting in subduction zones : a novel approach using high pressure metapelites	LeVay, Brian J.	Geosciences	Geosciences	M.S.	2004	Kerrick, Derrill M.
Neogene landscape evolution of the Northern California Coast Ranges : evidence for mendocino triple junction tectonics	Lock, Jane	Geosciences	Geosciences	M.S.	2004	Deines, Peter
Applications of remote sensing imagery to characterize effects of shallow groundwater levels at Hierakonpolis resulting from nearby irrigation practices	Montandon, L.	Geology	Geology	M.S.	2004	Alexander, Shelton S.
Use of remote sensing with ground truth and GIS to study the hyrological setting of the Hierakonpolis archeological site in Egypt	Montandon, Laure M.	Geosciences	Geosciences	M.S.	2004	Parizek, Richard
Earthquake Rupture Processes Along the Philippine Trench	Sevilla, Winchelle Ian G.	Geoscience	Geoscience	M.S.	2004	Ammon, Charles J.
Interpreting Vertical Carbon Isotope Gradients in Ancient Oceans: Paleocene and Eocene	Hilting, Anna	GEOSC	Geosciences	M.S.	2004	Kump, Lee
Abrupt changes in ice shelves and ice streams: model studies	Dupont, Todd K.	Geoscience	Geoscience	Ph.D.	2004	Alley, Richard B.
Late Archean microbial ecology [electronic resource] : an integration of molecular, isotopic, and lithologic studies	Eigenbrode, Jennifer L.	Geosciences	Geosciences	Ph.D.	2004	Freeman, Katherine H.
Late Ordovician Ocean-Climate System and paleobiogeography [electronic resource]	Herrmann, Achim D.	Geosciences	Geosciences	Ph.D.	2004	Patzkowsky, Mark E.
Source mechanisms of very-long-period signals at Merapi Volcano, Indonesia, and Soufriere Hills Volcano, Montserrat, B.W.I	Hidayat, Dannie	Geosciences	Geosciences	Ph.D.	2004	Voight, Barry
Lacustrine paleoenvironments froM.S.table isotopes of hydrogen and carbon in lipids	Pedentchouk, Nikolai	Geosciences	Geosciences	Ph.D.	2004	Freeman, Katherine H.
Lacustrine paleoenvironments from stable isotopes of hydrogen and carbon in lipids	Pedentchouk, Nikolai	Geosciences	Geosciences	Ph.D.	2004	Freeman, Katherine H.
The role of flexure in joint development during drape folding and oroclinal bending	Uzcategui G., Redescal S.	Geosciences	Geosciences	Ph.D.	2004	Engelder, Terry
Analysis of joint set dispersion as an indicator of stress field variability in three structural provinces of the Ouachita Orogenic Belt, Oklahoma and Arkansas	Whitaker, Amy Elizabeth	Geosciences	Geosciences	Ph.D.	2004	Engelder, Terry
Structural evolution of slate belts [electronic resource] : examples from Taiwan and eastern Pennsylvania	Yeh, En-Chao	Geosciences	Geosciences	Ph.D.	2004	Fisher, Donald M.

Detrital-Mineral Thermochronology: Investigations of Orogenic Denudation in the Himalaya of Central Nepal	Brewer, Ian	GEOSC	Geosciences	Ph.D.	2004	Burbank, Douglas
Spatial associations between climate and leaf wax n-alkanes from C_3 and C_4 grasses	Beausang, David H.	Geosciences, Geography	Geosciences	B.S.	2005	Brent Yarnal
Use of acoustic approximations for characterizing glacier bed roughness	Beharry, Monty S.	Geosciences	Geosciences	B.S.	2005	Unknown
Reliability of speleothems as proxies for paleoclimate as observed through crystal structure and banding characteristics	Brightbill, Bryan K.	Geosciences	Geosciences	B.S.	2005	Unknown
Modelling the driving forces behind basin formation, Wanganui Basin, North Island, New Zealand: an argument for a Pacific chisel mechanism	Cook, Stephanie A.	Geosciences	Geosciences	B.S.	2005	Unknown
Investigating the distribution of biofacies with respect to water depth : a gradient analysis of the Middle Ordovician Salona and Coburn Formations of Central Pennsylvania	Engelder, Todd Marlett	Geosciences	Geosciences	B.S.	2005	Unknown
A high resolution isotopic and geochemical record of the cretaceous-tertiary boundary event in the North Pacific Ocean	Geleskie, Sara Renee	Geosciences, Chemistry	Geosciences	B.S.	2005	Michael A. Arthur
Small open slender-coral (Tetradium) thickets in the Mid-Ordovician of central Pennsylvania	Hastings, Alexander	Geosciences	Geosciences	B.S.	2005	Unknown
The impacts of global warming on trout streams in the United States	Karchner, Ryan D.	Geosciences, Information sciences and technology	Geosciences	B.S.	2005	Richard B. Alley
Correlating climate and leaf economics to leaf physiognomy within a single California oak species (Quercus kelloggii Newberry)	Kirby, Crystal	Geosciences	Geosciences	B.S.	2005	Unknown
Relief evolution in the Anyemaquen Shan region of the northeastern Tibetan Plateau : inferences from analysis of river profiles	Kline, Kimberly R.	Geosciences	Geosciences	B.S.	2005	Eric Kirby
Multidecadal growth variations of Montastrea annularis corals in San Salvador, Bahamas, and the record of Saharan dust accumulation	Koelmel, Lauren Jeanne	Geosciences	Geosciences	B.S.	2005	Unknown
High resolution chemostratigraphic correlations of marine and non-marine strata of the Eastern Margin, Cretaceous Western Interior Seaway of North America	Ku Shafie, Ku Rafidah	Geosciences	Geosciences	B.S.	2005	Unknown
Slope stability related to road fills along I-99 section C-10 in central PA	Lutz, Dustin	Geosciences	Geosciences	B.S.	2005	Unknown
Bryozoan species composition and possible sedimentologic roles in an unusual siliciclastic mud mound from the Chesterian (Mississippian) of Langston Gap, Alabama	McCartney, Jacob A.	Geosciences	Geosciences	B.S.	2005	Roger J. Cuffey
A comparison of the stratal geometry and facies of the Campanian Panther Tongue Member, UT, and a modern clinoform in the Gulf of Papua	O'Hayer, Walter W.	Geosciences	Geosciences	B.S.	2005	Unknown
Biogeochemical cycling of phosphate in a meromictic lake	Ryan, Katherine E.	Geosciences	Geosciences	B.S.	2005	Unknown
Calcareous nannoplankton rebound rates after the K/T boundary at Site 1212, Shatsky Rise, Northern Pacific Ocean	Spengler, Alison	Geosciences	Geosciences	B.S.	2005	Unknown

Determining the properties of subglacial tills of the Ice Stream D Region of Antarctica using amplitude versus offest (AVO) seismic techniques	Stanish, Gregory M.	Geosciences	Geosciences	B.S.	2005	Unknown
Refined analysis of seismically active zones in southern Victoria Land, Antarctica using hypoDD	Stapley, Neil	Geosciences	Geosciences	B.S.	2005	Unknown
Tectonic implications of stream profiles in the Fila Costeña fold and thrust belt, Pacific Coast, Costa Rica	Trasko, Keith	Geosciences	Geosciences	B.S.	2005	Unknown
Modeling open system metamorphic decarbonation of subducting slabs	Gorman, Patrick J.	Geosciences	Geosciences	M.S.	2005	Kerrick, Derrill
Organic matter diagenesis and nitrogen isotopes in Cretaceous, Cenomanian/Turonian black shales	Junium, Christopher Kendall	Geosciences	Geosciences	M.S.	2005	Arthur, Michael A.
Geochemistry of Albian (Early Cretaceous) shallow-water carbonates of the Caribbean Province	Leppold, Daniel W.	Geosciences	Geosciences	M.S.	2005	Arthur, Michael A.
Statistical analyses of hydrogeologic factors influencing well yield and permeability in south-central Pennsylvania	Llewellyn, Garth Thomas	Geosciences	Geosciences	M.S.	2005	Parizek, Richard
The kinematics and dynamics of active low-angle normal faults in Panamint and Searles Valley, CA	Numelin, Tye J.	Geosciences	Geosciences	M.S.	2005	Kirby, Eric
Sublacial geology and its influence on streaming ice flow : observations and interpretations along two West Antarctic ice streams	Peters, Leo Everett	Geosciences	Geosciences	M.S.	2005	Anandakrishnan, Sridhar
Balanced cross sections of the Fila Costeña thrust belt : constraints on the inner forearc kinematics	Sitchler, Jason Cale	Geosciences	Geosciences	M.S.	2005	Unknown
Assessing conceptions of planetary atmospheres through collaborative learning	Smith, Karianne Linn Chessario	Earth Science	Earth Science	M.S.	2005	House, Christopher
The upper mantle structure beneath the Transantarctic Mountains and East Antarctic craton using body-wave tomography	Watson, Timothy Daniel	Geosciences	Geosciences	M.S.	2005	Nyblade, Andrew
Moderate and Large Earthquake Activity along Oceanic Transform Faults	Vandemark, Thomas	GEOSC	Geosciences	M.S.	2005	Ammon, Charles
The upper mantle seismic velocity structure beneath the Arabian Shield and East Africa	Benoit, Margaret H.	Geosciences	Geosciences	Ph.D.	2005	Nyblade, Andrew
Detrital-mineral thermochronology [electronic resource] : investigations of orogenic denudation in the Himalaya of central Nepal	Brewer, Ian D.	Geosciences	Geosciences	Ph.D.	2005	Burbank, Douglas
A coupled atmosphere-ecosystem model of the early Archean biosphere [electronic resource]	Kharecha, Pushker A.	Geosciences	Geosciences	Ph.D.	2005	Kasting, James
The role of land cover change in long-term climate change [electronic resource]	Lamptey, Benjamin L.	Geosciences	Geosciences	Ph.D.	2005	Barron, Eric
Understanding paleoclimatic change through firnification modeling	Spencer, Matthew Keith	Geosciences	Geosciences	Ph.D.	2005	Alley, Richard
Passive Acoustic Monitoring of Coarse Bedload in Mountain Streams	Barton, Jonathan	GEOSC	Geosciences	Ph.D.	2005	Slingerland, Rudy
Biogeochemical Weathering of Iron-Silicate Minerals	Buss	GEOSC	Geosciences	Ph.D.	2005	Brantley, Susan
Taxic and Phylogenetic Approaches to Understanding the Late Ordovician Mass Extinction and Early Silurian Recovery	Krug, Andrew Z.	GEOSC	Geosciences	Ph.D.	2005	Patzkowsky, Mark E.
Surface Waves, Earth Structure and Seismic Discrimination	Maceira, Monica	GEOSC	Geosciences	Ph.D.	2005	Ammon, Charles

Geomorphology of Laterally Advected Fault Blocks in Convergent Orogens	Miller, Scott	GEOSC	Geosciences	Ph.D.	2005	Slingerland, Rudy
Microbial Trace Metal Requirements: Limiting Nutrients and Potential Biosignatures	Zerkle, Aubrey	GEOSC	Geosciences	Ph.D.	2005	House, Christopher
Synthesis and leaching of rare-earth doped alumino-silicate and alumino-germano-silicate glasses	Castle, William Raymond	Material Science and engineering	Earth Science	B.S.	2006	Unknown
Petrogensis of evolved lavas from Quaternary volcanic centers of Turkana, Kenya	Creamer, Jeffrey B.	Geosciences	Geosciences	B.S.	2006	Tanya Furman
Eemian record of [delta]^{18}O[subscript]atm and CH_4 correlated to the Vostok EGT4 timescale from the Moulton Blue Ice Field, West Antaretica	Custer, Stanton Everett	Geosciences	Geosciences	B.S.	2006	Unknown
Comparison of modern anthropogenic and natural beach scallops in Ocean City, Maryland	Didlake, Timothy J.	Earth sciences	Earth sciences	B.S.	2006	Unknown
Comparison of oceanographic and atmospheric events that affect streamflow across the United States	Gilham, Kristopher T.	Geosciences	Geosciences	B.S.	2006	Unknown
Stable isotope records from Paleocene rocks of the Scaglia Rossa formation in the Apennines Mountains of Italy	Jacoby, Ryan James	Geosciences	Geosciences	B.S.	2006	Unknown
Consolidation experiments of mudstone samples from the Ursa Basin, Gulf of Mexico	Jones, Cody D.	Geosciences	Geosciences	B.S.	2006	Unknown
Evidence for a recent dike injection in northern California using gravity and seismicity	Key, April Janet	Geosciences	Geosciences	B.S.	2006	Unknown
The effects of CH_4 in a CO_2-dominant atmospheric model of Mars	Koeber, Steven	Geosciences	Geosciences	B.S.	2006	Unknown
Lower paleozoic oxygen isotope values from carbonate rocks : primary or diagenetic?	Menotti, Theresa A.	Geosciences	Geosciences	B.S.	2006	Unknown
Taphonomy of two horizons from Don's Gooseberry Pit, Black Hills, SD	Pardi, Melissa I.	Geosciences	Geosciences	B.S.	2006	Unknown
Rates and patterns of fluvial incision along the Yellow River in northeastern Tibet : inferences from Pleistocene-Holocene terrace sequences	Rogers, Matthew J.	Earth sciences	Earth sciences	B.S.	2006	Kirby, Eric
Exploration of Karst development in Laurel Caverns using geochemical and geophysical techniques	Russell, Scot A.	Geosciences	Geosciences	B.S.	2006	Unknown
Effects of large irrigation projects on regional ground water chemistry near Hierakonpolis, Egypt	Stearns, Andrew D.	Geosciences	Geosciences	B.S.	2006	Unknown
The Younger Dryas transition observed in lacustrine sediments from Castor Lake, Washington	Thornburg, Jesse D.	Geosciences	Geosciences	B.S.	2006	Unknown
An investigation of carbon isotopic fractionation by Methanococcus thermolithotrophicus	Vrentas, Jennifer M.	Geosciences, Biochemistry, Molecular biology	Geosciences	B.S.	2006	Christopher H. House
Limited tertiary shortening in the northeastern Tibetan Plateau : evidence from the margin of theLinxia basin	Angerman, Charles E.	Geosciences	Geosciences	M.S.	2006	Kirby, Eric
Using oceanic oxygen trends to improve climate change detection	Brennan, Catherine E.	Geosciences	Geosciences	M.S.	2006	Keller, Klaus

Forward modeling of compaction and fluid flow in the Ursa Region, Mississippi Canyon area, Gulf of Mexico	Christopher, Louanne Marie	Geosciences	Geosciences	M.S.	2006	Flemings, Peter
Mechanics of middle-ground bar formation : implications for the morphodynamics of delta channel networks	Edmonds, Douglas A.	Geosciences	Geosciences	M.S.	2006	Rudy Slingerland
Channel incision and accomodation : predicting compartmentalization in a channel-levee turbidite reservoir	Enunwa, Chekwube I.	Geosciences	Geosciences	M.S.	2006	Flemings, Peter
Phytoplankton recovery following the cretaceous-paleogene mass extinction	Fuqua, Lauren M.	Geosciences	Geosciences	M.S.	2006	Bralower, Timothy
Structural and stratigraphic contraints on the tectonics of the Chulitna terrane, South-Central Alaska	Gilman, Tony Leroy	Geosciences	Geosciences	M.S.	2006	Fisher, Donald
Coupled geomorphic and geodynamic modeling of a potential blind thrust in Marin County, California	Johnson, Courtney B.	Geosciences	Geosciences	M.S.	2006	Furlong, Kevin
Friction of dimensionally restricted granular layers : the role of surface roughness and material properties	Knuth, Matthew William	Geosciences	Geosciences	M.S.	2006	Chris J. Marone
Inner forearc response to subduction of the Panama Fracture Zone at the Middle America Trench, southern Central America	Morell, Kristin D.	Geosciences	Geosciences	M.S.	2006	Fisher, Donald
Thermoelastic stresses accumulated during exhumation of paleozoic New England granitoids : inferences from microcrack fabrics	Nadan, Brett J.	Geosciences	Geosciences	M.S.	2006	Engelder, Terry
Lipid and sulfur isotope geochemistry of tubeworm associated sediments in the Gulf of Mexico	Nielson, Kristine E.	Geosciences	Geosciences	M.S.	2006	Freeman, Katherine
Laboratory study of till deformation : comparison of creep and strength characteristics	Rathbun, Andrew Paul	Geosciences	Geosciences	M.S.	2006	Chris J. Marone
Time-lapse seismic analysis of the Tahoe field, Viosca Knoll Block 783, offshore Gulf of Mexico	Razzano, Joseph L.	Geosciences	Geosciences	M.S.	2006	Flemings, Peter
Laboratory investigation of the frictional behavior of granular volcanic material	Samuelson, Jon E.	Geosciences	Geosciences	M.S.	2006	Marone, Christopher
Seismic geomorphology, lithology, and evolution of the late Pleistocene Mars-Ursa turbidite region, Mississippi Canyon area, Northern Gulf of Mexico	Sawyer, Derek E.	Geosciences	Geosciences	M.S.	2006	Flemings, Peter
Role of coastal flows in building the Holocene clinothem in the Gulf of Papua	Selover, Robert Wentworth	Geosciences	Geosciences	M.S.	2006	Slingerland, Rudy
Seismic imaging and velocity analysis in complex media using downward continuation methods	Sen, Satyakee	Geosciences	Geosciences	M.S.	2006	Anandakrishnan, Sridhar
Differential compaction and porosity loss in devonian shale of the Catskill Delta Complex	Towarak, Meryl Janet	Geosciences	Geosciences	M.S.	2006	Engelder, Terry
Interactions of extracellular polymeric substances with mineral surfaces : molecular modeling, fourier transform infrared, atomic force microscopy, and quartz crystal microbalance with dissipation	Kwon, Kideok	Geosciences	Geosciences	Ph.D.	2006	Kubicki, James

Dynamics of shallow marine gas hydrate and free gas systems	Liu, Xiaoli	Geosciences	Geosciences	Ph.D.	2006	Flemings, Peter
Continental rifting in central Ethiopia [electronic resource] : geochemical and isotopic constraints from lavas and xenoliths	Rooney, Tyrone O.	Geosciences	Geosciences	Ph.D.	2006	Furman, Tanya
Molecular and isotopic investigations of the biogeochemistry of archaeal ether lipids [electronic resource]	Turich, Courtney Hanna	Geosciences	Geosciences	Ph.D.	2006	Katherine H. Freeman
Quantifying Subsurface Nitrate Transport and Remediation Using Gene Expression and Finite Element Models	Bachmann, Matthew	GEOSC	Geosciences	Ph.D.	2006	Kump, Lee
Basalt Weathering on Earth and on Mars	Hausrath, Elizabeth	GEOSC	Geosciences	Ph.D.	2006	Brantley, Susan
Quantitative Studies of Suspended Sediment in Karst Aquifers	Herman, Ellen K.	GEOSC	Geosciences	Ph.D.	2006	Slingerland, Rudy
Lavas and Tephras of Merapi Volcano, Java, Indonesia: Insights from Textural Analyses and Geochemistry	Innocenti, Sabrina	GEOSC	Geosciences	Ph.D.	2006	Furman, Tanya
Lithospheric Structure of North Africa and Western Eurasia	Kosarian, Minoo	GEOSC	Geosciences	Ph.D.	2006	Ammon, Charles
Methanosarcinales Biogeochemistry, Implications for Methane Cycling	Moran, James	GEOSC	Geosciences	Ph.D.	2006	Freeman, Katherine
Investigating the Paleocene/Eocene Carbon Cycle Perturbation: An Earth System Model Approach	Panchuk, Karla	GEOSC	Geosciences	Ph.D.	2006	Kump, Lee
Upper Mantle Seismic Velocity Structure beneath the Kenya Rift and the Arabian Shield	Park, Yongcheol	GEOSC	Geosciences	Ph.D.	2006	Nyblade, Andrew A.
The Effects of Friction on Earthquake Triggering and Fault Zone Evolution	Savage, Heather	GEOSC	Geosciences	Ph.D.	2006	Marone, Christopher
Implications of seafloor expulsion features of the Auger, Basin, deep water Gulf of Mexico	Dixon, Joshua F.	Geosciences	Geosciences	B.S.	2007	Unknown
Microbial influence on carbonate dissolution in stratified waters in the Frasassi cave system, Italy	Hegemann, Robert F.	Geosciences	Geosciences	B.S.	2007	Unknown
Coping with change : past & present human response to climate change, an exhibit for the EMS Museum	Hinkel, Katherine Elizabeth	Geosciences, Anthropology	Geosciences	B.S.	2007	Russell W. Graham, Richard
Adjusting the photochemical model for Archean earth	Hoffman, Jason	Geosciences	Geosciences	B.S.	2007	Unknown
Possible lateritic paleosol beneath the Earth's oldest (~ 3.42 Ga) recognized land surface in the Pilbara Craton, western Australia	Johnson, Ian M.	Geosciences	Geosciences	B.S.	2007	Unknown
The affect of basaltic dike intrusions on accommodating extensional strain over the past 5 Ma, Western Basin and Range, U.S	Markiewicz, Dawn L.	Geosciences	Geosciences	B.S.	2007	Unknown
Geochemical evaluation of the biotic or abiotic origins of 2.7 Ga stromatolites from Western Australia	Mobilia, Michael Philip	Geosciences	Geosciences	B.S.	2007	Unknown
Soil profiles as indicators of mineral weathering rates in basalt	Peightal, Brian M.	Geosciences	Geosciences	B.S.	2007	Unknown
Carbon isotope analysis of the Silurian Wills Creek Formation in central Pennsylvania	Rega, Kevin P.	Geosciences	Geosciences	B.S.	2007	Unknown
Investigation of Gondwana break-up by geochemical analysis of continental flood basalts	Rhode, Abagail P.	Geosciences	Geosciences	B.S.	2007	Unknown
The hydraulic geometry of stream channels in Centre County, Pennsylvania : applications for stream restoration	Rouse, William A.	Geosciences	Geosciences	B.S.	2007	Unknown

Investigating the alteration of volcanic rocks associated with the 3.46 billion year old Marble Bar Chert using the Horiba XGT 5000 X-ray chemical microscope	Bevacqua, David Cicero	Geosciences	Geosciences	M.S.	2007	Ohmoto, Hiroshi
Paleoclimatic analysis of the eocene Laguna del Hunco, Green River, and Republic floras using digital leaf physiognomy	Cariglino, Bárbara	Geosciences	Geosciences	M.S.	2007	Wilf, Peter
The effects of normal stress and shear displacement rate on the transition from jamming to rolling in sheared granular media	Carpenter, Brett Matthew	Geosciences	Geosciences	M.S.	2007	Marone, Christopher
Implications of rate-limited mass transfer for aquifer storage and recovery efficiency	Culkin, Sean L.	Geosciences	Geosciences	M.S.	2007	Kamini Singha
The ridgecrest hypothesis and the oxygen isotopic evolution of seawater	Howard, Mary Tazewell	Geosciences	Geosciences	M.S.	2007	Unknown
Nannofossil speciation events and environmental changes in the Paleocene and Eocene : a Paleoecological and biostratigraphic perspective	Kalb, Andrea L.	Geosciences	Geosciences	M.S.	2007	Timothy J. Bralower
A probabilistic assessment of land use change carbon dioxide emissions	Miltich, Louise Irene	Geosciences	Geosciences	M.S.	2007	Keller, Klaus
High-resolution chemostratigraphic correlations of mid-Cretaceous strata deposited from the eastern margin to the axial basin of the western interior basin, northwestern Iowa to northeastern Wyoming	Morath, Philip J.	Geosciences	Geosciences	M.S.	2007	White, Timothy S.
Testing bedrock channel incision models in the Finger Lakes Region, New York	Mullen, Andrea	Geosciences	Geosciences	M.S.	2007	Eric Kirby
Response of submarine hydrologic monitoring instruments to formation pressure changes : theory and application to Nankai ACORKS	Sawyer, Audrey Hucks	Geosciences	Geosciences	M.S.	2007	Flemings, Peter
An astrobiological evolution of Mars with a focus on its radiation environments and the implications for planetary habitability	Schneider, Susana Irene	Geosciences	Geosciences	M.S.	2007	Kasting, James
From angstroms to microns [electronic resource] : studies of interfaces and macromolecules with geochemical implications using computational and nonlinear optical tools	Campen, Richard Kramer	Geosciences	Geosciences	Ph.D.	2007	James D. Kubicki
Cation exchange selectivity and hydrothemal reactions of K-depleted micas	Cho, Yunchul	Soil Science	Earth Science	Ph.D.	2007	Sridhar Komarneni
Modeling novel isotopic proxies for the oxygenation of the earth's surface [electronic resource]	Domagal-Goldman, Shawn D.	Geosciences, Astrobiology	Geosciences	Ph.D.	2007	Kasting, James
Lithospheric structure beneath eastern Africa from joint inversion of receiver functions and Rayleigh wave velocities [electronic resource]	Dugda, Mulugeta Tuji	Geosciences	Geosciences	Ph.D.	2007	Nyblade, Andrew A.
Integrating seismological and tectonic studies to constrain lithospheric evolution at complex plate boundaries [electronic resource]	Hayes, Gavin Peter	Geosciences	Geosciences	Ph.D.	2007	Furlong, Kevin
Time-resolved structural analyses of cation exchange reactions in synthetic birnessite [electronic resource]	Lopano, Christina Lynn	Geosciences	Geosciences	Ph.D.	2007	Heaney, Peter
Annual variations in ground-water temperature as a tracer of river-aquifer interactions [electronic resource]	Moret, Geoff J.M.	Geosciences	Geosciences	Ph.D.	2007	Parizek, Richard

Carbonate-associated sulfate [electronic resource] : assessment of and use as an isotopic proxy for global sulfur cycling during end-permian mass extinction	Riccardi, Anthony L.	Geoscience	Geoscience	Ph.D.	2007	Kump, Lee
Deformation, lava dome evolution, and eruption cyclicity at Merapi Volcano, Indonesia [electronic resource]	Young, Kirby David	Geosciences	Geosciences	Ph.D.	2007	Voight, Barry
Subsurface stratal geometries in the northern Appalachian Basin : the Geneseo (Burket) Black Shale and the Tully Limestone	Arnold, LaMichelle A.	Geosciences	Geosciences	B.S.	2008	Engelder, Terry
The Monte San Vicino thrust: blind or elusive?	Dearolf, Bret	Geosciences	Geosciences	B.S.	2008	Unknown
Predicting temperature dependent hydraulic conductivity variation and its implications for contaminant transport near pumping wells	Donovan, Theodore	Geosciences	Geosciences	B.S.	2008	Unknown
Spatial analysis of geochemical parameters and loading of acidity from Moshannon Creek and Clearfield Creek into the West Branch of the Susquehanna River	Fang, Allison	Geosciences	Geosciences	B.S.	2008	Rose, Arthur
Boulder fields of the Tuscarora Formation : single or multiple history of development	Gentoso, Matthew J.	Geosciences	Geosciences	B.S.	2008	Richard R. Parizek
Coulomb failure stress changes from the 2000 eruption of Hekla, Iceland on surrounding structures	Gilbert, Timothy M.	Geosciences	Geosciences	B.S.	2008	Peter C. LcFemina
Quantifying lithologic and geochemical heterogeneity of the middle silurian Rose Hill Shale, central Pennsylvania	Giri, Poonam A.	Geosciences	Geosciences	B.S.	2008	White, Timothy S.
Geochemical variation in rhyolitic glasses from the Long Valley region of eastern California	Hastings, Ronald J.	Geosciences	Geosciences	B.S.	2008	Maureen Feineman
Understanding tectonic/eustatic controls on stratigraphic evolution of Cambrian-Ordovician sequences in central Pennsylvania using backstripping analysis	Kuhn, Joshua K.	Geosciences	Geosciences	B.S.	2008	Bice, David M.
Using numerical methods to quantify the onset of turbulent flow to wells during pumping tests	Kuntz, Brad W.	Geosciences	Geosciences	B.S.	2008	Kamini Singha
The nature and origin of cyclic sedimentation in the Gulf of Papua Holocene clinothem	Lightfoot, Andrew M.	Geology	Geology	B.S.	2008	Rudy Slinger
Testing a model of river mouth bar sedimentology	McGuire, Kathleen Elizabe	Geosciences	Geosciences	B.S.	2008	Douglas A. Edmonds
A grid search algorithm for earthquake location and uncertainty analysis applied to a challenging volcanic environment	Modrak, Ryan T.	Geosciences	Geosciences	B.S.	2008	Charles J. Ammon
Cenozoic kinematic history of the fiordland tectonic block, New Zealand, and associated plate boundary evolution	Palethorpe, Stephanie	Geosciences	Geosciences	B.S.	2008	Kevin P. Furlong
Quantitative permeability analysis of shear bands formed under low confining pressures	Perez, Enrique	Geosciences	Geosciences	B.S.	2008	Demian Saffer
Assessing the enviornmental [sic] impacts of Interstate 99 highway construction	Roffo, Paolo R.	Geosciences	Geosciences	B.S.	2008	Matthew S. Fantle

Cleavage pattern used to determine the structural/topographic framework of the Taconic orogeny in western Massachusetts and eastern New York	Shaak, Rachel	Geosciences	Geosciences	B.S.	2008	Donald M. Fisher
Was El Nino operating in the late Miocene?	Smith, Leon G.	Geosciences	Geosciences	B.S.	2008	Bice, David M.
Seismic and hazard analysis of recent moderate-magnitude seismic activity in the Gulf of Mexico	Todd, Erin K.	Geosciences	Geosciences	B.S.	2008	Charles J. Ammon
Accommodation change during bypass across a late stage fan in the shallow Auger Basin [electronic resource]	Bohn, Charles W.	Geosciences	Geosciences	M.S.	2008	Peter B. Flemings
The correlation between joint orientation and transport direction in the Sawtooth Salient, northern Montana [electronic resource]	Cannon, David (David L.)	Geosciences	Geosciences	M.S.	2008	Engelder, Terry
Detecting ENSO period changes in a proxy record spanning the last millennium [electronic resource]	Dorin, Joshua N.	Geosciences	Geosciences	M.S.	2008	Klaus Keller
Experimental investigation of the dehyration conditions of antigorite with implications to subduction zones	Ehmann, Amy Nicole	Geosciences	Geosciences	M.S.	2008	David Eggler
Controls on fluvial longitudinal profile and sediment characteristics [electronic resource] : predictions from a morphodynamic model	Fambrough, Brooke A.	Geosciences	Geosciences	M.S.	2008	Rudy L. Slingerland
DEEP PORE PRESSURES AND SEAFLOOR VENTING IN THE AUGER BASIN, GULF OF MEXICO	Reilly, Matthew	Geosciences	Geoscience	M.S.	2008	Peter B. Flemings
Pore pressure development within underthrust sediments at the Nankai subduction zone [electronic resource] : implications for décollement mechanics and sediment dewatering	Skarbek, Robert M.	Geosciences	Geosciences	M.S.	2008	Demian M. Saffer
Pore pressure development within underthrust sediments at the Nankai subduction zone [electronic resource] : implications for décollement mechanics and sediment dewatering	Skarbek, Robert M.	Geosciences	Geosciences	M.S.	2008	Saffer, Demian M.
The effect of temperature and precipitation on sodium depletion fronts in soils developed on Peoria loess [electronic resource]	Williams, Jennifer Zan	Geosciences	Geosciences	M.S.	2008	Susan L. Brantley
The Earth's Oldest (3.4GA) Paleosol at Trendall Ridge in the North Pole Dome Region of the Eeast Pilbara Craton, Western Australia	Johnson, Ian	GEOSC	Geosciences	M.S.	2008	Ohmoto, Hiroshi
Linking paleobiological patterns across geographic scales [electronic resource] : an example using upper Mississippian fossil assemblages from the Illinois and Appalachian Basins, USA	Bonelli, James Rocco	Geosciences	Geosciences	Ph.D.	2008	Mark E. Patzkowsky
Trace metal biosignatures [electronic resource]	Cameron, Vyllinniskii	Geosciences, Astrobiology	Geosciences	Ph.D.	2008	Christopher H. House
Variations in insect herbivory on angiosperm leaves through the late Paleocene and early Eocene in the Bighorn Basin, Wyoming, USA [electronic resource]	Currano, Ellen Diane	Geosciences	Geosciences	Ph.D.	2008	Peter Wilf
Investigations of fluid flow and heat transport related to the strength of the San Andreas Fault [electronic resource]	Fulton, Patrick M.	Geosciences	Geosciences	Ph.D.	2008	Demian M. Saffer

Biogeochemistry of oceanic euxinia in earth history [electronic resource] : numerical modeling and evaluation of biomarkers using modern analogs	Meyer, Katja Maria	Geosciences, Biogeochemistry	Geosciences	Ph.D.	2008	Lee, R. Kump; Katherine H. Freeman
Biogeochemistry of granitic weathering [electronic resource]	Moore, Joel	Geosciences	Geosciences	Ph.D.	2008	Susan L. Brantley
Understanding redox processes in surface environments from iron oxide transformations and multiple sulfur isotope fractionations [electronic resource]	Otake, Tsubasa	Geosciences, Astrobiology	Geosciences	Ph.D.	2008	Hiroshi Ohmoto
Weathering advance rates in basalt [electronic resource] : prediction and comparison across scales	Sitchler, Alexis K.	Geosciences	Geosciences	Ph.D.	2008	Susan L. Brantley
Intramolecular isotopic variation in acetate in sediments and wetland soils [electronic resource]	Thomas, Randal B.	Geosciences, Biogeochemistry	Geosciences	Ph.D.	2008	Michael A. Arthur; Christopher H. House
Geodetic and seismic observations of ice-stream dynamics [electronic resource]	Winberry, Jeremy Paul	Geosciences	Geosciences	Ph.D.	2008	Sridhar Anandakrishnan
Stress and permeability measurements from the Kumano (Japan) forearc basin	Adamson, Nicholas	Geosciences	Geosciences	B.S.	2009	Unknown
Teleseismic relocation of aftershock events beneath the Aceh Basin, northern Sumatra	Barrett, Sarah Anne	Geosciences	Geosciences	B.S.	2009	Unknown
Estimating methane hydrate inventories and predicting sea level changes effect on hydrate stability	Brainard, Jamie L.	Geosciences	Geosciences	B.S.	2009	Hiroshi Ohmoto
Covariation of boron concentrations and isotope ratios in glasses from the Laki-Grimsvötn fissure eruption of 1783-1784	Brounce, Maryjo	Geosciences	Geosciences	B.S.	2009	Unknown
Characterizing the shallow subsurface of the Shale Hills Critical Zone Observatory	Daniels, Terryl G.	Geosciences	Geosciences	B.S.	2009	Unknown
Stream channel gradient vs. rock uplift rate in the Siwalik Hills of northern India	Donovan, Adam M.	Geosciences	Geosciences	B.S.	2009	Unknown
Improving comprehension of geomorphic concepts through inquiry based learning	Ellis, Jenna I.	Geosciences	Geosciences	B.S.	2009	Unknown
Glacial dynamics in southeastern Iceland : reflection seismology at Svinafellsjökull	Kohler, Kyle Nelson	Geosciences	Geosciences	B.S.	2009	Unknown
Grain size distribution and micropaleontology of Cretaceous-Paleocene sediments in Brazos, Texas	Kutz, Justin M.	Geosciences	Geosciences	B.S.	2009	Unknown
Poisson's ratio of the upper crust beneath Montserrat	Young, Alysa	Geosciences	Geosciences	B.S.	2009	Charles J. Ammon
Controls on groundwater chemistry in the Cape Cod Aquifer, Massachusetts [electronic resource] : the impact of accessory mineral phases on solute concentrations, 87sr/86sr, and rare earth element distributions	Alexander, Brian W.	Geosciences	Geosciences	M.S.	2009	Brantley, Susan L.
Transport in silicon quantum dots embedded in a rare earth oxide	Aliyaru Kunju, Ashkar Ali	Engineering Science	Earth Science	M.S.	2009	Suman Datta, Osama O. Awadelkarim

Crustal structure along the Transantarctic Mountain front using receiver functions [electronic resource]	Finotello, Marco	Geosciences	Geosciences	M.S.	2009	Andrew A. Nyblade, Jordi Julià
Late Pleistocene slip rates along the Panamint Valley fault zone, eastern California [electronic resource]	Hoffman, William R.	Geosciences	Geosciences	M.S.	2009	Eric Kirby
The earth's oldest (~3.4 ga) paleosol at Trendall Ridge in the North Pole Dome region of the East Pilbara Craton, Western Australia [electronic resource]	Johnson, Ian M.	Geosciences	Geosciences	M.S.	2009	Hiroshi Ohmoto
CARBON AND HYDROGEN ISOTOPIC COMPOSITION OF METHANE OVER THE LAST 1000 YEARS	Mischler, John A.	Geosciences	Geosciences	M.S.	2009	Richard B. Alley & Todd A. S
The origin of earthquake swarms along the eastern branch of the east African Rift system in Tanzania [electronic resource]	Mulibo, Gabriel Daudi	Geosciences	Geosciences	M.S.	2009	Nyblade, Andrew A.
Temporal and spatial variations in deformation across a ridgetransform intersection, northern Iceland [electronic resource]	O'Hara, Caroline Anne	Geosciences	Geosciences	M.S.	2009	Peter LaFemina
Topographically driven groundwater flow through a heterogeneous permeability subsurface [electronic resource] : implications for surface heat flow near Parkfield, California and in the western Mojave Desert	Popek, Margaret A.	Geosciences	Geosciences	M.S.	2009	Demian M. Saffer
Timing and kinematics of Neogene uplift of the Abukuma Massif, Northeastern Honshu, Japan [electronic resource]	Regalla, Christine A.	Geosciences	Geosciences	M.S.	2009	Donald Fisher
A multivariate analysis of the recovery of calcareous nannoplankton and planktonic foraminifera from the Cretaceous/Paleogene (K/P) mass extinction [electronic resource]	Schueth, Jonathan D.	Geosciences	Geosciences	M.S.	2009	Timothy J. Bralower
The depth distribution of seismicity at the northern end of the Rwenzori Mountains [electronic resource] : implications for heat flow in the Western Rift, Uganda	Tugume, Fred Alex	Geosciences	Geosciences	M.S.	2009	Nyblade, Andrew A.
Porosity prediction froM.S.eismic data using multiattribute transformations, N sand, Auger Field, Gulf of Mexico [electronic resource]	Valenti, Joseph Christian Adam Frank	Geosciences	Geosciences	M.S.	2009	Charles J. Ammon
Porosity prediction from seismic data using multiattribute transformations, N sand, Auger Field, Gulf of Mexico [electronic resource]	Valenti, Joseph Christian A	Geosciences	Geosciences	M.S.	2009	Charles J. Ammon
Investigating the impact of advective and diffusive controls in solute transport on geoelectrical data [electronic resource]	Wheaton, Daniel D.	Geosciences	Geosciences	M.S.	2009	Kamini Singha
Analyzing Tamseis Data for Seismic Events of High Temporal Regularity and Large Magnitude (Mw=1.8) beneath David Glacier, and for Long- Period Plate-Margin Events	Zoet, Lucas K.	Geosciences	Geoscience	M.S.	2009	Sridhar Anandakrishnan
What is the Skill of Climate Parameter Estimation Methods? A Case Study with Global Average Observational Constraints	Olson, Roman	GEOSC	Geosciences	M.S.	2009	Keller, Klaus
Estimating the ages of glacial landforms from the statistical distributions of cosmogenic exposure dates [electronic resource]	Applegate, Patrick J.	Geosciences	Geosciences	Ph.D.	2009	Richard B. Alley, Michael E. Mann

Geochemical requirements of the anaerobic oxidation of methane in the Eel River Basin [electronic resource]	Beal, Emily J.	Geosciences	Geosciences	Ph.D.	2009	Christopher H. House
Coupling soil nitrogen cycling and hydropedlogy within forests and agroecosystems	Castellano, Michael J.	Soil Science	Earth Science	Ph.D.	2009	Jason P. Kaye
The growth and evolution of river-dominated deltas and their distributary networks [electronic resource]	Edmonds, Douglas A.	Geosciences	Geosciences	Ph.D.	2009	Rudy Slingerland
Millennial slip-rates along the eastern kunlun fault and rapid evolution of channel morphology in the Yellow River headwaters, northeastern Tibet, China [electronic resource]	Harkins, Nathan W.	Geosciences	Geosciences	Ph.D.	2009	Eric Kirby
Geophysical observations of polar ice sheets and ice shelves [electronic resource]	Horgan, Huw J.	Geosciences	Geosciences	Ph.D.	2009	Sridhar Anandakrishnan
Soil formation and terrestrial biosignatures in the Middle Cambrian [electronic resource]	Horodyskyj, Lev	Geosciences, Astrobiology	Geosciences	Ph.D.	2009	Lee R. Kump, Timothy S. White
BIOGEOCHEMICAL CYCLING OF COPPER IN ACID MINE DRAINAGE	Kimball, Bryn E.	Geosciences	Geosciences	Ph.D.	2009	Brantley, Susan L.
Two-plume dynamics beneath the East African Rift System [electronic resource] : a geochemical persepective [sic]	Nelson, Wendy R. (Wendy Rae)	Geosciences	Geosciences	Ph.D.	2009	Tanya Furman
A seismic investigation of basal conditions in glaciated regions [electronic resource]	Peters, Leo Everett	Geosciences	Geosciences	Ph.D.	2009	Sridhar Anandakrishnan
Using seismic data to interpret the mechanism for cenozoic volcanism beneath Ross Island, Antarctica and the Cameroon Volcanic Line, West Africa [electronic resource]	Reusch, Angela Marie	Geosciences	Geosciences	Ph.D.	2009	Nyblade, Andrew A.
The diversity, ecology, climate, and preservation of marine communities in the twenty million years following the end Cretaceous mass extinction [electronic resource]	Sessa, Jocelyn Anne	Geosciences	Geosciences	Ph.D.	2009	Mark E. Patzkowsky, Timothy J. Bralower
Modeling glacier-rock-climate interactions [electronic resource] : moraine deposition, stagnation events, and supraglacial debris	Vacco, David A.	Geosciences	Geosciences	Ph.D.	2009	Richard B. Alley
Two-Plume Dynamics beneath the East African Rift System: A Geochemical Perspective	Nelson, Wendy	GEOSC	Geosciences	Ph.D.	2009	Furman, Tanya
Laboratory Measurement of Shear Induced Fault Zone Dilatancy, and Numerical Estimation of Its Influence on Friction Constitutive Parameters in Quasi-Undrained Scenarios	Samuelson, Joe E.	GEOSC	Geosciences	Ph.D.	2009	Marone, Christopher
Palagonitiztion : a study of the kinetics and chemical composition of the hydrothermal alteration of basalt glass	Ayrer, James E.	Geosciences	Geosciences	B.S.	2010	Bice, David M.
Rupture processes of the 20 March 2008, Mw 7.1, Yutian (Xinjiang-Xizang border region) earthquake in the northern Tibetan Plateau	Baag, So-Young	Geosciences	Geosciences	B.S.	2010	Bice, David M.
Volcano-earthquake stress interactions : an example from Nicaragua	Bachman, Andrew C.	Geosciences	Geosciences	B.S.	2010	Bice, David M.
Fracture mechanics of the Marcellus gas shale	Call, Travis T.	Geosciences	Geosciences	B.S.	2010	Bice, David M.

Relationship between grain size distribution, mineralogy and gamma ray signature in the Mahantango Formation	Campbell, Chirs	Geosciences	Geosciences	B.S.	2010	Engelder, Terry
Strain rate analysis in South Iceland using the Global Positioning System	Dooling, Patrick R.	Geosciences	Geosciences	B.S.	2010	Unknown
Tectonic subsidence and thermal history of the southwestern part of the Malay Basin	Fuad, Ahmad Syahir Ahma	Geosciences	Geosciences	B.S.	2010	Bice, David M.
Consolidation and permeability of sediments beneath a megasplay fault in the Nankai Trough Subduction Zone	Gildow, Marie C.	Geosciences	Geosciences	B.S.	2010	Bice, David M.
The effect of sediment porosity and permeability on plate boundary forces [electronic resource]	Gildow, Marie C.	Geosciences, Environmental Systems Engineering	Geosciences	B.S.	2010	Demian Saffer
Stratigraphic and structural characteristics of the Mahantango Formation in Selinsgrove, Pennsylvania	Hayward, Jessica M.	Geosciences	Geosciences	B.S.	2010	Bice, David M.
The role of topographic erosion in controlling glacier length : a modeling study	Jeon, Kyungho	Geosciences	Geosciences	B.S.	2010	Richard B. Alley
Modeling the thermal maturation history of the Appalachian Basin	Jonas, Michael E.	Geosciences	Geosciences	B.S.	2010	Unknown
Using seimicity [sic] to monitor and quantify glacier dynamics [electronic resource]	Kluskiewicz, Daniel J.	Geosciences, Mathematics, Physics	Geosciences	B.S.	2010	Nyblade, Andrew A.
The heat flow evolution of the Malay Basin	Maarof, Mohd Razis Sofhi	Geosciences	Geosciences	B.S.	2010	Bice, David M.
Molecular analysis of benthic biofilms from acidic coal mine drainage, Pennsylvania, USA [electronic resource]	Mills, Daniel Brady	Geosciences, Geobiology	Geosciences	B.S.	2010	Jenn Macalady
Thermal maturation modeling in the NE of the Malay Basin	Ripin, Mohd Hafiz Mohd	Geosciences	Geosciences	B.S.	2010	Bice, David M.
Plate motions in South Iceland from block modeling of episodic GPS measurements	Robertson, Jesse E.	Geosciences	Geosciences	B.S.	2010	Unknown
Backstripping of the Malay Basin : 3D modeling and analysis	Rosselly, Mohd Nor Afifi M	Geosciences	Geosciences	B.S.	2010	Bice, David M.
Water availability for hydraulic fracturing in the Marcellus Shale region, Centre and Clearfield Counties, Pa	Singh, Simret	Geosciences	Geosciences	B.S.	2010	Bice, David M.
Anomalous thermal maturation patterns in Devonian shales in Western Pennsylvania : an update using new vitrinite reflectance data and heat flow modeling	Tornegard, Thomas S.	Geosciences	Geosciences	B.S.	2010	Unknown
Kinematic analysis of the Marlborough fault zone, New Zealand since the early Miocene	Ward, Kevin Michael	Geosciences	Geosciences	B.S.	2010	Unknown
Regional depositional trends in the Devonian Geneseo/Burket black shale based on gamma ray-density characteristics [electronic resource]	Arnold, LaMichelle A.	Geosciences	Geosciences	M.S.	2010	Engelder, Terry
Observation and analysis of repeating earthquakes beneath the Aceh Basin, northern Sumatra [electronic resource]	Barrett, Sarah Anne	Geosciences	Geosciences	M.S.	2010	Ammon, Charles
Geochemistry and depositional environment of the Union Springs Member of the Marcellus Shale in Pennsylvania [electronic resource]	Bracht, Reed	Geosciences	Geosciences	M.S.	2010	Arthur, Michael A., Engelder, T. (Terry)

Carbon addition during the Paleocene-Eocene thermal maximum [electronic resource] : model inversion of a new, high-resolution carbon isotope record froM.S.valbard	Cui, Ying	Geosciences	Geosciences	M.S.	2010	Lee R. Kump
Carbon addition during the Paleocene-Eocene thermal maximum [electronic resource] : model inversion of a new, high-resolution carbon isotope record from Svalbard	Cui, Ying	Geosciences	Geosciences	M.S.	2010	Lee R. Kump
Geochemistry of 24 Ma basalts from northeast Egypt [electronic resource] : implications for widespread magmatism in northern Africa	Endress, Chira A.	Geosciences	Geosciences	M.S.	2010	Tanya Furman
Reconstructing paleoclimates on West Antarctic ice sheet using ice core bubble number-density [electronic resource]	Fegyveresi, John M.	Geosciences	Geosciences	M.S.	2010	Richard B. Alley
Laboratory, field, and modeling analysis of solute transport behavior at the Shale Hills Critical Zone Observatory [electronic resource]	Kuntz, Brad W.	Geosciences	Geosciences	M.S.	2010	Kamini Singha
The tectonic and thermal evolution of Hawke's Bay Basin, New Zealand [electronic resource]	Legg, Matthew J.	Geosciences	Geosciences	M.S.	2010	Kevin P. Furlong
Local and broad scale changes in North American small mammal community structure [electronic resource] : the late Pleistocene through the late Holocene	Pardi, Melissa I.	Geosciences	Geosciences	M.S.	2010	Russell W. Graham
Laboratory measurements of permeability reduction in naturally occuring shear bands formed in unlithified sands [electronic resource]	Perez, Enrique	Geosciences	Geosciences	M.S.	2010	Demian M. Saffer
STRATIGRAPHY AND PALEOENVIRONMENTS OF THE RED HILL SITE NEAR HYNER, PENNSYLVANIA	Peterson, Daniel A.	Geosciences	Geosciences	M.S.	2010	Patzkowsky, Mark E.
Uppermost mantle P-wave velocity structure of the main Ethiopian Rift [electronic resource]	Rouse, Stewart Desmond	Geosciences	Geosciences	M.S.	2010	Nyblade, Andrew A.
What is the skill of climate parameter estimation methods? : a case study with global average observational constraints	Tonkonojenkov, Roman	Geosciences	Geosciences	M.S.	2010	Klaus Keller
Lessons froM.S.oggy Leaves: A Pre-Settlement Flora from White Clay Creek, Chester County, Pennsylvania	Grettenberger, Christen	GEOSC	Geosciences	M.S.	2010	Wilf, Peter
A seismic investigation of crust and upper mantle structure beneath the Zagros Mountains and the southern and East African plateaus [electronic resource]	Adams, Aubreya Nicole	Geosciences	Geosciences	Ph.D.	2010	Nyblade, Andrew A.
Structural geology and kinematics associated with the collision of the Wrangellia composite terrane and North America, south-central Alaska [electronic resource]	Bier, Sara Elizabeth	Geosciences	Geosciences	Ph.D.	2010	Fisher, Donald M.
ENVIRONMENTAL AND ECOLOGICAL CONSTRAINTS ON MOLECULAR AND ISOTOPIC SIGNATURES IN TERRESTRIAL ORGANIC CARBON	Diefendorf, Aaron F.	Geosciences	Geosciences and Biogeochemistry	Ph.D.	2010	Katherine H. Freeman & Jen

Interpreting nitrogen isotope excursions in the sedimentary record	Fulton, James M.	Geosciences	Geosciences	Ph.D.	2010	Michael A. Arthur, Katherine H. Freeman.
Mechanisms of aqueous crystallization and phase transformation in titanium oxide minerals [electronic resource]	Hummer, Daniel R.	Geosciences	Geosciences	Ph.D.	2010	Peter J. Heaney
Compositional, mechanical and hydrologic controls on fault slip behavior [electronic resource]	Ikari, Matt J.	Geosciences	Geosciences	Ph.D.	2010	Chris Marone, Demian M. Saffer
Volcano-tectonic evolution of Flateyjarskagi, north central Iceland [electronic resource]	Jancin, Mark D.	Geosciences	Geosciences	Ph.D.	2010	Voight, Barry
Nitrogen biogeochemistry and ancient oceanic anoxia [electronic resource]	Junium, Christopher Kendall	Geosciences	Geosciences	Ph.D.	2010	Michael A. Arthur
Pre-anatectic and anatectic processes in an eclogite from the Erzgebirge, southeastern Germany [electronic resource] : implications for arc magmatism	LeVay, Brian J.	Geosciences	Geosciences	Ph.D.	2010	Maureen D. Feineman, Derrill M. Kerrick
An experimental investigation of frictional and hydraulic properties of shear zones, with application to earthquake faults and glacial till [electronic resource]	Rathbun, Andrew Paul	Geosciences	Geosciences	Ph.D.	2010	Chris J. Marone
Laboratory measurement of shear induced fault zone dilatancy, ad numerical estimation of its influence on friction constitutive parameters in quasi-undrained scenarios [electronic resource]	Samuelson, Jon E.	Geosciences	Geosciences	Ph.D.	2010	Chris Marone
Late Miocene to Recent Arc-Forearc Response to Plate Tectonics Surrounding the Panama Triple Junction, Southern Central Amerca	Morell, Kristin	GEOSC	Geosciences	Ph.D.	2010	Fisher, Donald
Finding controls of shoreline variability experimental earthscape XES-10	AlAbbad, Abrar A.	Geosciences	Geosciences	B.S.	2011	Unknown
Fluid flow along the decollement zone within the accretionary wedges (Nankai Trough and Costa Rica Margin) from boron and lithium variations	Azizan, Nurul Fatini	Geosciences	Geosciences	B.S.	2011	Maureen Feineman
Do earthquakes on large strike slip faults follow a Gutenberg-Richter distribution? [electronic resource]	Bydlon, Samuel	Geosciences, Mathematics	Geosciences	B.S.	2011	Charles Ammon
Using Brazilian disk tests to define tensile strength of two lithologies from the Upper Oatka Creek Member of the marcellus shale [electronic resource]	Cronin, Michael	Geosciences, Petroleum and Natural Gas Engineering	Geosciences	B.S.	2011	Engelder, Terry
Crustal contributions to the evolution of the Diamante Caldera-Maipo Volcanic Complex, Southern Volcanic Zone	Drew, Dana L.	Geosciences	Geosciences	B.S.	2011	Bice, David M.
Carbon isotope analysis of the silurian Bloomsburg and Wills Creek formations in Central Pennsylvania	Frey, Dylan W. S.	Geosciences	Geosciences	B.S.	2011	Bice, David M.
The effects of weathering on rare earth element (REE) uptake [electronic resource] : a study of Pleistocene and Eocene fossil material	Grimm, Brittany L.	Geosciences	Geosciences	B.S.	2011	Russell W. Graham
Electrical resitivity imaging during a dilution tracer test to model hyporheic flow of acid mine drainage [electronic resource]	Herwehe, Lauren	Geosciences, Geography	Geosciences	B.S.	2011	Kamini Singha
PETM weathering record from clay-minerals : Wilson Lake, NJ	Ishak, Ahmad Zamzamie.	Geosciences	Geosciences	B.S.	2011	Bice, David M.

Haiti aftershock relocation using the double-difference method and general factor analysis of earthquake fatalities	Marin, Jonathan T.	Geosciences	Geosciences	B.S.	2011	Charles J. Ammon
Sequence stratigraphic interpretation of a Late Ordovician potential gas shale: the Utica Formation of Pennsylvania, New York, and Ohio	McClain, Taylor G.	Geosciences	Geosciences	B.S.	2011	Bice, David M.
Single crystal gypsum dehydration in saturated brine conditions [electronic resource]	Present, Theodore Michae	Geosciences	Geosciences	B.S.	2011	Matthew Fantle
Basal roughness at upper thwaites glacier [electronic resource]	Boon, Xiang Ying Rebecca	Geosciences	Geosciences	M.S.	2011	Sridhar Anandakrishnan
DEPOSITIONAL ENVIRONMENTS OF PALEOCENE PLANT LOCALITIES WITHIN ESTUARINE FACIES OF THE SALAMANCA FORMATION, CHUBUT PROVINCE, ARGENTINA	Comer, Emily E.	Geosciences	Geosciences	M.S.	2011	Rudy L. Slingerland
ANISOTROPY BENEATH THE TIBETAN PLATEAU: A SURVEY OF SHEAR WAVE SPLITTING ANALYSES	Desser, Elizabeth M.	Geosciences	Geosciences	M.S.	2011	Charles J. Ammon
AN EXPERIMENTAL INVESTIGATION OF MULTIPLE SULFUR ISOTOPE FRACTIONATIONS DURING HETEROGENEOUS REACTIONS BETWEEN SO2 AND ACTIVATED CARBON	Hamasaki, Hiroshi	Geosciences	Geosciences	M.S.	2011	Hiroshi Ohmoto
AN INVESTIGATION OF THE MECHANISMS OF CALCIUM ISOTOPIC FRACTIONATION IN GYPSUM	Harouaka, Khadouja	Geosciences	Geosciences	M.S.	2011	Matthew S. Fantle
UPPER MANTLE STRUCTURE BENEATH THE GAMBURTSEV SUBGLACIAL MOUNTAINS AND EAST ANTARCTICA FROM BODY-WAVE TOMOGRAPHY	Lloyd, Andrew Jason	Geosciences	Geosciences	M.S.	2011	Andrew A. Nyblade
Lessons froM.S.oggy leaves [electronic resource] : a pre-settlement flora from White Clay Creek, Chester County, Pennsylvania	Miller, Christen L.	Geosciences	Geosciences	M.S.	2011	Peter Wilf
Lessons from soggy leaves [electronic resource] : a pre-settlement flora from White Clay Creek, Chester County, Pennsylvania	Miller, Christen L.	Geosciences	Geosciences	M.S.	2011	Peter Wilf
GREENHOUSE WARMING BY NITROUS OXIDE AND METHANE IN THE PROTEROZOIC EON	Roberson, April L.	Geosciences	Geosciences	M.S.	2011	James F. Kasting
Principal axes of stress and strain in the Kumano forearc basin from inversion of a normal fault population mapped in a 3D seismic volume, Nankai Trough, SW Japan [electronic resource]	Sacks, Alison F.	Geosciences	Geosciences	M.S.	2011	Demian M. Saffer, Donald M. Fisher
Transient channel incision in response to the Mendocino triple junction migration, northern California [electronic resource]	Shi, Xuhua	Geosciences	Geosciences	M.S.	2011	Eric Kirby, Kevin P. Furlong
An experimental study of lithium partitioning between olivine and diopside at upper mantle conditions [electronic resource]	Yakob, Jessica L.	Geosciences	Geosciences	M.S.	2011	Maureen D. Feineman
Tropical Canopy Insects Link Leaf Damage in Fossil and Living Forests	Ramirez-Carvalho, Monica	GEOSC	Geosciences	M.S.	2011	Wilf, Peter
Bacteriohopanepolyols across environmental gradients [electronic resource]	Albrecht, Heidi Lynn	Geosciences, Biogeochemistry	Geosciences	Ph.D.	2011	Katherine H. Freeman, Jennifer L. Macalady

Structural and geomorphic evolution of the Gonghe basin complex, northeastern Tibet [electronic resource] : implications for the timing of plateau growth	Craddock, William H.	Geosciences	Geosciences	Ph.D.	2011	Eric Kirby
Biogeochemistry of isoprenoid production and anaerobic hydrocarbon biodegradation	Dawson, Katherine S.	Geosciences	Geosciences	Ph.D.	2011	Jennifer L. Macalady, Katherine H. Freeman.
Structural transformations of birnessite ([delta]-mno_2) during biological and abiological reduction [electronic resource]	Fischer, Timothy B.	Geosciences, Biogeochemistry	Geosciences	Ph.D.	2011	Peter J. Heaney
MICROBIAL ECOLOGY AND BIOGEOCHEMISTRY OF SULFIDIC KARST ECOSYSTEMS	Jones, Daniel S.	Geosciences	Geosciences & Biogeochemistry	Ph.D.	2011	Jennifer L. Macalady & Matthew S. Fantle
Crustal response to changes in the magmatic system at the Soufrière Hills volcano, Montserrat	Miller, Victoria L.	Geosciences	Geosciences	Ph.D.	2011	Barry Voight, Charles J. Ammon.
Late miocene to recent arc-forearc response to plate tectonics surrounding the Panama triple junction, southern Central America	Morell, Kristin D.	Geosciences	Geosciences	Ph.D.	2011	Donald Fisher
The effect of dissimilatory iron reduction, nitrate reduction and microbial growth on electrical conductivity [electronic resource]	Regberg, Aaron B.	Geosciences	Geosciences	Ph.D.	2011	Susan L. Brantley, Kamini Singha
The diversity and coping mechanisms of life inhabiting the hypersaline Dead Sea	Rhodes, Matthew E.	Geosciences	Geosciences	Ph.D.	2011	Christopher H. House
Seismic velocity variations under island arcs [electronic resource] : examples from the Philippines and Montserrat (Lesser Antilles)	Sevilla, Winchelle Ian G.	Geosciences	Geosciences	Ph.D.	2011	Charles J. Ammon
The Precambrian crustal structure of east Africa	Tugume, Fred Alex.	Geosciences	Geosciences	Ph.D.	2011	Nyblade, Andrew A.
Abiotic controls on copper isotope fractionation during the dissolution of copper sulfide minerals	Wall, Andrew J.	Geosciences	Geosciences	Ph.D.	2011	Peter J. Heaney.
Crustal Response to Changes in the Magmatic System at the Soufriere Hills Volcano, Montserrat	Miller, Victoria	GEOSC	Geosciences	Ph.D.	2011	Voight, Barry
Revisiting the Hubbert-rubey Hypothesis for overthrust faulting: Inferences from progressive mineralization on bedding slip surfaces during flexural slip folding of Devonian Shale, the Appalachian Basin, Usa	Aydin, Murat Gorkem	Geosciences	Geosciences	M.S.	2012	Terry Engelder
GEOMECHANICAL PROPERTIES OF MARCELLUS SHALE CORE SAMPLES WITHIN A SEQUENCE STRATIGRAPHIC FRAMEWORK	Call, Travis	Geosciences	Geosciences	M.S.	2012	Terry Engelder
Organization and distribution of middle devonian biofacies within a sequence stratigraphic framework, Huntingdon County, Pennsylvania, USA [electronic resource]	Deptola, Travis J.	Geosciences	Geosciences	M.S.	2012	Patzkowsky, Mark E. (Mark Edward)
Novel Insect Leaf-Mining at Mexican Hat, Montana (Early Paleocene) and the Demise of Cretaceous Leaf Miners	Donovan, Michael	GEOSC	Geosciences	M.S.	2012	Wilf, Peter
SUBFOSSIL LEAVES FROM LANCASTER COUNTY, PENNSYLVANIA REVEAL A NEW UPLAND FLORAL COMPONENT OF THE PRE-EUROPEAN PIEDMONT LANDSCAPE	Elliot, Sara J.	Geosciences	Geosciences	M.S.	2012	Peter D. Wolf

SPATIAL VARIATION OF CHEMICAL CONSTITUENTS IN NATURAL WATERS AND THEIR RELATION TO INCIDENCE OF BURULI ULCER IN GOLD-MINING REGIONS OF GHANA	Hagarty, Julianne	Geosciences	Geosciences	M.S.	2012	Kamini Singha
REGIONAL MOMENT TENSORS FROM THE 2010-2012 CANTERBURY EARTHQUAKE SEQUENCE, SOUTH ISLAND, NEW ZEALAND	Herman, Matthew W.	Geosciences	Geosciences	M.S.	2012	Kevin P. Furlong
SPATIO-TEMPORAL VARIABILITY IN THE PHOTOTROPHIC CHEMOCLINE COMMUNITY AT FAYETTEVILLE GREEN LAKE (NEW YORK)	Hunter, Stamatina Elizabeth	Geosciences	Geosciences	M.S.	2012	Lee R. Kump
CHARACTERIZING DIFFERING MODES OF SUPRAGLACIAL LAKE DRAINAGE EVENTS ALONG THE WESTERN MARGIN OF THE GREENLAND ICE SHEET USING GPS, PASSIVE SEISMIC, AND MODIS SATELLITE DATA	Justin, Randy M.	Geosciences	Geosciences	M.S.	2012	Sridhar Anandakrishnann
RARE LEAF FOSSILS OF MONIMIACEAE AND ATHEROSPERMATACEAE (LAURALES) FROM EOCENE PATAGONIAN RAINFORESTS AND THEIR BIOGEOGRAPHIC SIGNIFICANCE	Knight, Cassandra	Geosciences	Geosciences	M.S.	2012	Peter Wilf
EFFECTS OF COCOS RIDGE COLLISION ON THE WESTERN CARIBBEAN: IS THERE A PANAMA BLOCK?	Kobayashi, Daisuke	Geosciences	Geosciences	M.S.	2012	Peter LaFemina
Sequence Stratigraphy and Depositional Environments of the Shamokin (Union Springs) Mbr., Marcellus Fm. and Associated Strata in the Middle Appalachian Basin	Kohl, Daniel Raymond	Geosciences	Geosciences	M.S.	2012	Rudy L. Slingerland
A Monogenetic Alkali Basalt Field East of the Andean Arc Between 34 and 35 S: Implications for Mantle Composition	Murray, Timothy	GEOSC	Geosciences	M.S.	2012	Feineman, Maureen
THERMAL AND GEOLOGIC CONSTRAINTS ON THE CRETACEOUS-TO-NEOGENE TECTONIC DEVELOPMENT OF THE KLAMATH MOUNTAINS, NORTHERN CALIFORNIA	Piotraschke, Rachel E.	Geosciences	Geosciences	M.S.	2012	Kevin P. Furlong
WEATHERING RESPONSES TO RAPID CLIMATE CHANGE: ANALYSIS OF A HIGH RESOLUTION OSMIUM ISOTOPE RECORD AT THE PALEOCENE-EOCENE THERMAL MAXIMUM	Wieczorek, Rebecca A.	Geosciences	Geosciences	M.S.	2012	Matthew S. Fantle
CRUSTAL STRUCTURE OF SOUTHEASTERN TANZANIA	Young, Alysa J.	Geosciences	Geosciences	M.S.	2012	Andrew J. Nyblade
The Influence of Fluid Properties on Geometric Complexity and Breakdown Pressure on Hydraulic Fracture	Alpern, Jennifer	GEOSC	Geosciences	M.S.	2012	Marone, Chris J.
Crustal Shear Wave Velocity Structure of Tanzania from Ambient Seismic Noise Tomography and the Thickness of Karoo and Younger Basins in Southeastern Tanzania	Boyle, Katie	GEOSC	Geosciences	M.S.	2012	Nyblade, Andrew
Grain Size Controls on Planform Morphology and Stratigraphy of River-Dominated Deltas	Burpee, Alexander	GEOSC	Geosciences	M.S.	2012	Slingerland, Rudy
Exploring a 60-Year Record of Manganese Deposition in Marietta Ohio Using Soil Chemistry and Atmospheric Dispersion Modeling	Carter, Megan	GEOSC	Geosciences	M.S.	2012	Brantley, Susan

Atmospheric Production of Glycolaldehyde under Hazy Prebiotic Conditions	Harman, Jr., Chester	GEOSC	Geosciences	M.S.	2012	Kasting, James
Shallow Water Redox Conditions From Permian-Triassic Boundary Microbialites The Rare Earth Element and Iodine Geochemistry of Carbonates from Turkey and South Cin China	Loop, Caroline M.	GEOSC	Geosciences	M.S.	2012	Kump, Lee
Evaluating Controls on Crevasse-Splay Growth in Modern and Ancient Fluvial Systems	Millard, Craig	GEOSC	Geosciences	M.S.	2012	Hajek, Elizabeth
Strain History of the Taiwan Orogenic Belt, Measured froM.S.yntectonic Pressure Shadows	Mondro, Claire	GEOSC	Geosciences	M.S.	2012	Fisher, Donald
Quantifying the Areal Extent and Dissolved Oxygen Concentrations of Archean Oxygen Oases	Olson, Stephanie	GEOSC	Geosciences	M.S.	2012	Kump, Lee
Electron Transfer and the Roles of Flavins during Iron(III) Reduction by Shewanella Oneidensis	Puls, Brendon	GEOSC	Geosciences	M.S.	2012	Kubicki, Jame
Late Miocene Erosion and Evolution of Topography along the Western Slope of the Colorado Rockies	Rosenberg, Russell	GEOSC	Geosciences	M.S.	2012	Kirby, Eric
Inter-Rifting And Inter-Seismic Strain Accumulation in a Propagating Ridge System: A Study FroM.S.outh Iceland	Travis, Matthew	GEOSC	Geosciences	M.S.	2012	LaFemina, Peter
Fault strength and stability [electronic resource] : lessons learned from the San Andreas fault in central California	Carpenter, Brett M.	Geosciences	Geosciences	Ph.D.	2012	Chris Marone
Geophysical exploration of glacier basal processes and grounding line dynamics	Christianson, Knut.	Geosciences	Geosciences	Ph.D.	2012	Sridhar Anandakrishnan.
Contaminant sequestration and phase transformation properties of birnessite-like phases ([delta]-MnO_2)	Fleeger, Claire R.	Geosciences	Geosciences	Ph.D.	2012	Peter J. Heaney.
Biogeochemistry of manganese contamination in a temperate forested watershed	Herndon, Elizabeth Maureen.	Geosciences	Geosciences	Ph.D.	2012	Susan Brantley.
Investigation of mantle structure beneath eastern Africa [electronic resource] : implications for the origin of the cenozoic tectonism and propagation of the rift system	Mulibo, Gabriel Daudi.	Geosciences	Geosciences	Ph.D.	2012	Nyblade, Andrew A.
Response of calcareous nannoplankton to climatic perturbations and the long-term impact on communities	Schneider, Leah.	Geosciences	Geosciences	Ph.D.	2012	Timothy J. Bralower, Lee R. Kump.
Application of density functional theory calculations to elucidate the structure of lignin linkages and the intermolecular interactions among proxies of lignin, hemicellulose, and cellulose	Watts, Heath D.	Geosciences	Geosciences	Ph.D.	2012	James D. Kubicki.
A study of discrete glacier motion	Zoet, Lucas K.	Geosciences	Geosciences	Ph.D.	2012	Sridhar Anandakrishnan.
Impact of Co2 on Fracture Complexity When Used as a Fracture Fluid in Rock	Culp, Brian	GEOSC	Geosciences	M.S.	2013	Marone, Vhristopher

The effect of oxygen fugacity on the equilibrium partitioning of lithium between olivine and clinopyroxene	Deane, James A.	Geosciences	Petrology	M.S.	2013	Feineman, Maureen
The Effect of Archean Oceans on Cyanobacteria, Green Sulfur Bacteria and the Rise of Oxygen	Baumann, Beth	GEOSC	Geosciences	M.S.	2013	House, Christopher
Mechanisms of Sulfur Isotope Fractionation During Thermochemical Sulfate Reduction by Amino Acids: Implications for the MIF-S Record in Archean Rocks	Chorney, Andrew	GEOSC	Geosciences	M.S.	2013	Ohmoto, Hiroshi
In-Situ Observations of Calcium Carbonate Phase Heterogeneity During Mineral Precipitation: Implications for the Interpretation of Calcium Carbonate Based Proxies	Gonzales, Matthew	GEOSC	Geosciences	M.S.	2013	Fantle, Matthew
Measuring Concentrations of Dissolved Natural Gas in Three Streams in Pennsylvania to Estimate Methane Fluxes from the Subsurface	Grieve, Paul	GEOSC	Geosciences	M.S.	2013	Brantley, Susan
Crustal Structure in Eastern and Southern Africa with Implications for Secular Variation in Precambrian Crustal Genesis	Kachingwe, Marsella	GEOSC	Geosciences	M.S.	2013	Nyblade, Andrew
Australian Analogs for an Eocene Patagonian Paleorainforest	Merkhofer, Lisa	GEOSC	Geosciences	M.S.	2013	Wilf, Peter
Analyzing the State of Lithospheric Stress in Greater Thailand Through Finite Element Modeling	Meyers, Beth	GEOSC	Geosciences	M.S.	2013	Furlong, Kevin
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Cenozoic forearc tectonics in northeastern Japan [electronic resource] : relationships between outer forearc subsidence and plate boundary kinematics	Regalla, Christine A.	Geosciences	Geosciences	Ph.D.	2013	Donald Fisher, Eric Kirby.
Fault Rupture Segmentation	Cleveland, Kenneth	GEOSC	Geosciences	Ph.D.	2013	Ammon, Charles
Shale Weathering across a Latitudinal Climosequence	Dere, Ashlee	GEOSC	Geosciences	Ph.D.	2013	Brantley, Susan
Crustal Deformation and Volcanism at Active Plate Boundaries	Geirsson, Halldor	GEOSC	Geosciences	Ph.D.	2013	LaFemina. Peter
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Investigating the Response of Calcareous Nannoplankton to Significant Environmental Disturbance: Links between Extinction and Environmental Change and the Role of Incumbency in Recovery	Schueth, Jonathan D.	GEOSC	Geosciences	Ph.D.	2013	Bralower, Timothy
Mechanical Properties of the Seismogenic Zone	Scuderi, Marco	GEOSC	Geosciences	Ph.D.	2013	Marone, Christopher
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Exogenous and Endogenous Sources of Organic Compounds on the Early Earth: Investigating Carbonaceous Meteorites and Plausibly Prebiotic Complex Mixtures by Liquid Chromatography-Mass Spectrometry	Smith, Karen	GEOSC	Geosciences	Ph.D.	2013	House, Christopher
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Lithofacies and Transport of Clastic Sediments in Karstic Aquifers	Bosch, Rachel	GEOSC	Geosciences	M.S.	2014	White, William
A Quantitative Assessment of the Effects of Base Level Fall and Basin Depth on River-Dominated Deltas	Cederberg, James	GEOSC	Geosciences	M.S.	2014	Slingerland, Rudy
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Stable Isotope and Lipid Signatures of Plants Across a Climate Gradien t: Implcations for Biomaker-Based Paleoclimate Reconstructions	Doman, Christine	GEOSC	Geosciences	M.S.	2014	Freeman, Katherine
In Situ pE-pH Analysis on the Oxidation Kinetics of Manganese Bearing Solution	Ethier Colon, William	GEOSC	Geosciences	M.S.	2014	Ohmoto, Hiroshi
The Role of Poroelasticity During Disequilibrium Compaction and Hydrocarbon Generation of Horizontal Stress in the Devonian Section	Johnston, Thomas	GEOSC	Geosciences	M.S.	2014	Engelder, Terry
Uplift and Shortening in the Nepalese and Indian Sub-Himalaya Determined with Quantitative Geomorphology	Meghani, Nooreen	GEOSC	Geosciences	M.S.	2014	Kirby, Eric
Experimental Investigation of Permeability and Mechanical Evolution of Catalcastic Deformation Bands	Miller, Peter	GEOSC	Geosciences	M.S.	2014	Saffer, Demian
Thermal Maturity of Gas Shales in the Appalachian Plateau of Pennsylvania	Modlich, Mitchell	GEOSC	Geosciences	M.S.	2014	Slingerland, Rudy
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The Origin of a Basin-Scale Thin Limestone: The Middle Devonian Cherry Valley Member, Marcellus Formation	Wang, Jiuyuan	GEOSC	Geosciences	M.S.	2014	Arthur, Michael
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Fine-Sediment Deposition and Storage in Sandy-Fluvial Systems	Wysocki, Nathaniel	GEOSC	Geosciences	M.S.	2014	Hajek, Elizabeth
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Assessment and Advancement of Approaches for the Study of Subseafloor Microbial Communities	Martino, Amanda	GEOSC	Geosciences	Ph.D.	2014	House, Christopher
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A Time-Resolved Synchrotron X-Ray Diffraction Study of the In Situ, Hydrothermal Synthesis of Goethite from 2-Line Ferrihydrite	Oxman, Matthew	GEOSC	Geosciences	M.S.	2015	Heaney, Peter
Improving the Statistical Method Can Raise the Upper Tail of Sea- Level Projections	Ruckert, Kelsey	GEOSC	Geosciences	M.S.	2015	Keller, Klaus

Ice-Age Cycling Enhancement of Volcanism and Geothermal Heat Flux: A Stress Modeling Study	Stevens, Nathan	GEOSC		Geosciences	M.S.	2015	Alley, Richard
Investigation of Fold Growth in North Canterbury, South island, New Zealand	Vanderleest, Rebecca	GEOSC		Geosciences	M.S.	2015	Fisher, Donald
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Experimental and Theoretical Study of the Effects of Microorganisms, Organic Molecules, and Atom Exchange Rates on the Ca Isotopic Composition of Gypsum: Implications for the Use of Ca Isotopes as a Geochemical Proxy	Harouaka, Khadouja	GEOSC		Geosciences	Ph.D.	2015	Matthew S. Fantle
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CRUSTAL STRUCTURE OF THE RUNGWE VOLCANIC PROVINCE AND REGION SURROUNDING THE NORTHERN LAKE MALAWI RIFT BASIN	Borrego, David James		GEOSC	Geosciences	M. S.	2016	Andy Nyblade
Distribution and abundance of benthic marine taxa in shelf margin depositional sequences: San Andres Formation (Guadalupian, Permian), Last Chance Canyon, New Mexico	Brown, Garett Mattingly		GEOSC	Geosciences	M. S.	2016	Mark E. Patzkowsky
Surface Microanalysis of Staining on Vertebrate Fossil Bone from the Santa Fe River, Florida	Foecke, Kimberly Kjaisa		GEOSC	Geosciences	M. S.	2016	Peter J Heaney
THE LIVING FILTER: MONITORING NITRATE ACCUMULATION AFTER 50 YEARS OF WASTEWATER IRRIGATION	Hagedorn, Jacob Gerrit		GEOSC	Geosciences	M. S.	2016	Demian Saffer
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Micro-Scale Sulfur and Carbon Isotope and Trace Metal Analysis of a Neoarchean Stromatolite: Evidence for a Redox Transition in Epeiric Platform Carbonates Prior to the Great Oxidation Event	Ilhardt, Peter Donald		GEOSC	Geosciences	M. S.	2016	Christopher H House
LITHOSPHERE TEARING AND THE FORMATION OF A NEW TRANSFORM PLATE BOUNDARY	Neely, James Scott		GEOSC	Geosciences	M. S.	2016	Kevin P Furlong

Accounting for deep uncertainties in sea-level rise and storm surge projections is critical to understanding risk trade-offs	Oddo, Perry Charles		GEOSC	Geosciences	M. S.	2016	Klaus Keller
The Contribution of Regional Variability to Beta Diversity: A Case Study of the Deep-water Marine Communities of the Middle Upper Ordovician of Eastern Laurentia	Perkons, Eriks		GEOSC	Geosciences	M. S.	2016	Mark E. Patzkowsky
Detecting and Locating Small Earthquakes On Remote Oceanic Transform Faults	Vieceli, Rhiannon Elizabet		GEOSC	Geosciences	M. S.	2016	Charles J Ammon
Temporal evolution of magma sources and surface deformation at Pacaya Volcano, Guatemala revealed by InSAR	Wnuk, Kendall Coleman		GEOSC	Geosciences	M. S.	2016	Christelle Wauthier
DISTRIBUTION AND ABUNDANCE OF BENTHIC MARINE TAXA IN SHELF MARGIN DEPOSITIONAL SEQUENCES OF THE SAN ANDRES FORMATION, LAST CHANCE CANYON, NEW MEXICO	Brown, Garett		GEOSC	Geosciences	M.S.	2016	Patzkowsky, Mark E.
Insights from Inside the Volcano: Genesis and Eruption of Thrihnukagigur Volcanics, Reykjanes Peninsula, Iceland	Hudak, Michael	GEOSC		Geosciences	M.S.	2016	Feineman, Maureen
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A molecular analysis of subsurface microbial communities across a hydrothermal gradient in Okinawa Trough sediments	Brandt, Leah Danielle		GEOSC	Geosciences	Ph. D.	2016	Christopher H House
Using Fluvial Stratigraphic Architecture to Isolate the Role of Avulsion Processes in Alluvial-basin Filling	Chamberlin, Ellen Putnam		GEOSC	Geosciences	Ph. D.	2016	Elizabeth A Hajek
Perspectives on the diagenetic alteration of marine carbonates using a multi-proxy approach: A multi-site comparison of Mg, Ca, and Sr isotopic compositions of carbonates	Chanda, Piyali		GEOSC	Geosciences	Ph. D.	2016	Matthew S Fantle
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Testing the Viability of Supercritical Carbon Dioxide as a Fracking Fluid by Computing its Chemical Interaction with Illite	Ajayi, Oluwaseyi Adebola		GEOSC	Geosciences	M. S.	2017	James Kubicki
FATE OF ELEMENTAL SULFUR IN A SULFIDIC CAVE AQUIFER MIXING ZONE	Clark, Christian Evan		GEOSC	Geosciences	M. S.	2017	Jennifer Macalady
A record of coupled hlllslope and channel response to Pleistocene periglacial erosion in a sandstone headwater valley, central Pennsylvania	Del Vecchio, Joanmarie		GEOSC	Geosciences	M. S.	2017	Roman A. DiBiase
Correcting δ13CH4 Analyses for Krypton Interference: The Potential Impact on Methane Budget Studies	Doyle, Emily Ann		GEOSC	Geosciences	M. S.	2017	Richard Alley

OCEANIC ANOXIA EVENT 2 (93.9 MA) IN THE U.S. WESTERN INTERIOR SEAWAY: HIGH RESOLUTION CALCAREOUS NANNOFOSSIL RECORD OF THE TROPIC SHALE FORMATION	Fortiz, Victoria	GEOSC	Geosciences	M. S.	2017	Timothy J. Bralower
PROBABILISTIC INVERSION OF EXPERT ASSESSMENTS TO INFORM PROJECTIONS ABOUT ANTARCTIC ICE SHEET RESPONSES	Fuller, Robert William	GEOSC	Geosciences	M. S.	2017	Klaus Keller
Reconstructing river mobility from ancient deposits: an example from the Willwood Formation (Bighorn Basin, WY)	Greenberg, Evan Bennett	GEOSC	Geosciences	M. S.	2017	Elizabeth Hajek
Changes in calcareous nannoplankton assemblages during the recovery of the Paleocene Eocene Thermal Maximum (PETM)	Grey, Jacqueline Ashley	GEOSC	Geosciences	M. S.	2017	Timothy Bralower
P AND S BODY WAVE TOMOGRAPHY OF THE NORTHERN LAKE MALAWI RIFT BASIN AND RUNGWE VOLCANIC PROVINCE	Grijalva, Ashley Nichole	GEOSC	Geosciences	M. S.	2017	Donald Fisher
Tracking the Paleocene-Eocene Thermal Maximum in the North Atlantic: A shelf-to-basin analysis with a terrain-following ocean model	Hantsoo, Kalev Griffin	GEOSC	Geosciences	M. S.	2017	Lee Kump
Near-Surface Geophysical Investigation of Karstic Controls on Localized Hillslope Hydrology	Kennedy, Curtis Ross	GEOSC	Geosciences	M. S.	2017	Tess Russo
MINERALOGICAL AND GEOCHEMICAL CONSTRAINTS OF CHROMIUM OXIDATION INDUCED BY BIRNESSITE	Kong, Kyeong Pil	GEOSC	Geosciences	M. S.	2017	Peter J Heaney
EVIDENCE FOR DISSIMILATORY NITRATE REDUCTION TO AMMONIA BY AQUEOUS BIOFILMS IN THE SULFIDIC CAVES OF FRASASSI, ITALY	Labrado, Amanda Leane	GEOSC	Geosciences	M. S.	2017	Jennifer Macalady
ECOLOGICAL CHANGES IN THE NANNOPLANKTON COMMUNITY ACROSS A SHELF TRANSECT DURING THE ONSET OF THE PALEOCENE-EOCENE THERMAL MAXIMUM	Leon y Leon, Isabel Aurora	GEOSC	Geosciences	M. S.	2017	Timothy Bralower
Analysis of Subglacial Sediment Properties in West Antarctica Using Seismic Amplitude Data	Marten, Jacob Patrick	GEOSC	Geosciences	M. S.	2017	Marten, Jacob Patrick
THE FEBRUARY 1993 KILAUEA EAST RIFT ZONE DIKE INTRUSION REVEALED THROUGH INSAR	Moore, Sarah Catherine	GEOSC	Geosciences	M. S.	2017	Christelle Wauthier
Anomalously Low δ18O Values of High-Latitude Permo-Triassic Paleosol Siderite: Implications for the Hydrologic Cycle during Warm Climate Intervals	Richard, Zachary David	GEOSC	Geosciences	M. S.	2017	Timothy S. White
Sedimentary record of the evolution of the Kumano Forearc Basin, offshore southwest Japan	Xu, Yang	GEOSC	Geosciences	M. S.	2017	Elizabeth Ann Hajek
CO2 Hydration and Hydroxylation: The Origin of Carbonate Kinetic Isotope Effects	Boettger, Jason Daniel	GEOSC	Geosciences	Ph. D.	2017	Susan L. Brantley
Multi-Objective Geophysical Inversion for Earth Structure and Earthquake Parameters	Chai, Chengping	GEOSC	Geosciences	Ph. D.	2017	Charles J. Ammon
Biogeographic, Functional, and Phylogenetic Consequences of the Pliocene to Modern in the Western Atlantic	Christie, Max Lawrence	GEOSC	Geosciences	Ph. D.	2017	Mark E Patzkowsky

RECOVERY OF PLANT-INSECT ASSOCIATIONS IN PATAGONIA, ARGENTINA AFTER THE END-CRETACEOUS EXTINCTION	Donovan, Michael Philip	GEOSC	Geosciences	Ph. D.	2017	Peter Wilf
CHARACTERIZING STRUCTURE AND GEOCHEMISTRY OF SHALE PORES BY NEUTRON SCATTERING	Gu, Xin	GEOSC	Geosciences	Ph. D.	2017	Susan L. Brantley
Oxygen as a Biosignature on Terrestrial Planets	Harman, Chester Ervin	GEOSC	Geosciences	Ph. D.	2017	James F. Kasting
Deformation Processes Throughout the Earthquake Cycle	Herman, Matthew William	GEOSC	Geosciences	Ph. D.	2017	Kevin P Furlong
Laboratory Studies of Fault Stability and Slow Earthquakes	Leeman, John Robert	GEOSC	Geosciences	Ph. D.	2017	Chris Marone
Isotopic and trace metal geochemistry of calcite, gypsum, and pyrite as proxies for ancient life and environments	Mansor, Muammar	GEOSC	Geosciences	Ph. D.	2017	Matthew Fantle
Towards understanding the impact of ocean acidification on the shell condition of thecosome pteropods	Oakes, Rosemary Louise	GEOSC	Geosciences	Ph. D.	2017	Timothy Bralower
Fault-Propagation Fold Kinematics and Deformation Rates in the North Canterbury Fold and Thrust Belt, South Island, New Zealand	Oakley, David Owen Smith	GEOSC	Geosciences	Ph. D.	2017	Donald Fisher
Seismic investigations of the crust and upper mantle structure in Antarctica and Madagascar	Ramirez, Cristo	GEOSC	Geosciences	Ph. D.	2017	Andrew Nyblade
Flow dynamics of the NE Greenland Ice Stream with hydrological insights from englacial exploration of Larsbreen, Svalbard	Riverman, Kiya Lihn	GEOSC	Geosciences	Ph. D.	2017	Sridhar Anandakrishnan
HOW LANDSCAPE DYNAMICS CAN ALTER THE PRESERVATION AND INTERPRETATION OF PALEOENVIRONMENTAL SIGNALS IN FLUVIODELTAIC ENVIRONMENTS	Trampush, Sheila Marie	GEOSC	Geosciences	Ph. D.	2017	Elizabeth Ann Hajek
Extremophiles in Built Environments	Wilpiszeski, Regina Leila	GEOSC	Geosciences	Ph. D.	2017	Christopher H House
Lithium isotopes in carbonate-rich marine sections: implications for diagenesis, authigenic clay formation, and the global lithium cycle	Andrews, Elizabeth Marie	GEOSC	Geosciences	M. S.	2018	Matthew S Fantle
Numerical Simulations of Productivity and Anoxia in the Western Interior Seaway During Oceanic Anoxic Event 2 (93.9 Ma)	Clark, Brandon	GEOSC	Geosciences	M. S.	2018	Lee Kump
CONTROLS ON SANDSTONE DITRIBUTIONS AND CONNECTIVITY IN THE SHALLOW-MARINE FOX HILLS SANDSTONE AND LANCE FORMATION (UPPER CRETACEOUS, GREAT DIVIDE BASIN, WYOMING, USA	Jimenez, Martin Matthew	GEOSC	Geosciences	M. S.	2018	Elizabeth A. Hajek
P and S Body Wave Tomography of Southern Africa	Ortiz, Kameron Jordan	GEOSC	Geosciences	M. S.	2018	Andrew Nyblade
SCALY FABRICS AND VEINS OF THE SHIMANTO BELT: A RECORD OF SILICA REDISTRIBUTION IN SUBDUCTION FAULT ZONES	Ramirez, Gabrielle Elizabet	GEOSC	Geosciences	M. S.	2018	Donald M Fishe
The Seismic Hazards Posed by New Mapped Offshore Segments of the Ranong and Khlong Marui Faults	Ramirez, Haley M	GEOSC	Geosciences	M. S.	2018	Kevin P Furlong
Analysis of Mixed Distribution Statistical Flood Frequency Models and Implications for Dam Safety Assessments	Roop-Eckart, Kenneth Joe	GEOSC	Geosciences	M. S.	2018	Klaus Keller
Dependence of Thwaites Glacier Stability on Bed Character	Schwans, Emily	GEOSC	Geosciences	M. S.	2018	Byron Parizek
P AND S BODY WAVE TOMOGRAPHY OF THE UPPER MANTLE IN CENTRAL AND EASTERN WEST ANTARCTICA	Soto, David Romualdo	GEOSC	Geosciences	M. S.	2018	Andrew A. Nyblade

UNDERSTANDING THE EFFECTS OF HYDROLOGIC CONNECTIVITY, LAND USE, AND LITHOLOGY ON WATER QUALITY ACROSS SCALES: FROM A ZEROTH ORDER CATCHMENT TO A HUC 10 WATERSHED IN THE SUSQUEHANNA RIVER BASIN	Wayman, Callum Richard	GEOSC	Geosciences	M. S.	2018	Susan L. Brantley
A Geochemical Approach to Mantle and Crustal Dynamics in Central Anatolia	Gall, Helen Deborah	GEOSC	Geosciences	Ph. D.	2018	Tanya Furman
Surface water-sediment interactions: Examples from pristine and contaminated catchments	Hoagland, Nell E	GEOSC	Geosciences	Ph. D.	2018	Susan L. Brantley
Laboratory Studies of Permeability Evolution: Roles of Fracture, Shear, Dynamic Stressing, and Reservoir Rock Properties	Madara, Benjamin James	GEOSC	Geosciences	Ph. D.	2018	Chris Marone
GEOCHEMICAL AND METAGENOMIC INVESTIGATION OF MARINE HYDROCARBON BIODEGRADATION	Nguyen, Uyen T	GEOSC	Geosciences	Ph. D.	2018	Jennifer Macalady
LITHOSPHERIC AND GLACIAL STRUCTURES FROM SEISMIC WAVE ANALYSIS IN GREENLAND AND ANTARCTICA	Pourpoint, Maeva	GEOSC	Geosciences	Ph. D.	2018	Sridhar Anandakrishnan
LABORATORY STUDIES OF FAULT RESTRENGTHENING: The Role of Shear Stress and Mineralogy Inferred from Mechanical and Ultrasonic Amplitude Measurements	Ryan, Kerry	GEOSC	Geosciences	Ph. D.	2018	Chris Marone
MECHANICAL BEHAVIOR OF MAJOR PLATE BOUNDARY FAULT SYSTEMS: INSIGHTS INTO THE STRESS STATE OF THE NANKAI SUBDUCTION-ACCRETION COMPLEX OFFSHORE SW JAPAN AND SLIP STABILITY OF THE ALPINE FAULT ZONE IN NEW ZEALAND	Valdez, Robert Dennis	GEOSC	Geosciences	Ph. D..	2018	Demian Saffer
Upper Mantle Structure Beneath the Northern East African Plateau from P- and S-wave Body-wave Tomography	Bressers, Cathleen	GEOSC	Geosciences	M. S.	2019	Andrew A. Nyblade
Uranium-series Geochemistry in Residual Soils: Examples from Central Pennsylvania	Carte, Jared L	GEOSC	Geosciences	M. S.	2019	Matthew S Fantle
EOCENE FOSSILS OF ARAUCARIA SECT. EUTACTA FROM PATAGONIA AND THEIR IMPLICATIONS FOR FLORAL TURNOVER DURING THE INITIAL ISOLATION OF SOUTH AMERICA	Harris, Gabriella	GEOSC	Geosciences	M. S.	2019	Peter D.l Wilf
HOW DO THE GAS HYDRATE SATURATION AND HYDRATE MORPHOLOGY CONTROL SEISMIC ATTENUATION: A CASE STUDY FROM THE SOUTH HYDRATE RIDGE	Ji, Aoshuang	GEOSC	Geosciences	M. S.	2019	Tieyuan Zhu
CONSTRAINTS ON EARTH'S THERMAL EVOLUTION FROM THE HEAVY NOBLE GAS CONTENT OF THE MANTLE	Reinhold, Matthew	GEOSC	Geosciences	M. S.	2019	Bradford J. Foley
OCEAN ECOSYSTEM TRANSFORMATION CAUSED BY RAPID WARMING AND SEA LEVEL RISE IN THE PLEISTOCENE CARIACO BASIN (MIS 9-7)	Rizzo, Adriana	GEOSC	Geosciences	M. S.	2019	Timothy Bralower
Land use versus climate controls on hillslope erosion at a farmed headwater catchment in central Pennsylvania	Silverhart, Perri	GEOSC	Geosciences	M. S.	2019	Roman A Dibiase

Documentation of novel diatom-associated calcification in a lacustrine whiting event at Fayetteville Green Lake, New York, USA	Stanton, Chloe	GEOSC	Geosciences	M. S.	2019	Lee Kump
PLANT EXTINCTION AND RECOVERY DYNAMICS ACROSS THE CRETACEOUS-PALEOGENE TRANSITION IN SOUTHERN SOUTH AMERICA	Stiles, Elena	GEOSC	Geosciences	M. S.	2019	Peter D. Wilf
Ultrasonic Monitoring of Laboratory Scale Hydraulic Fracturing	Witham, Timothy	GEOSC	Geosciences	M. S.	2019	Chris J Marone
WORKING WITH CITIZEN SCIENTISTS AND HOMEOWNERS IN PENNSYLVANIA TO UNDERSTAND HYDROCARBON-RELATED CONTAMINATION OF WATER RESOURCES	Woda, Joshua	GEOSC	Geosciences	M. S.	2019	Susan L. Brantley
Constraints from Monazite Petrochronology on the Assembly of the Ivrea-Verbano Zone	Wyatt, Damaris Christine	GEOSC	Geosciences	M. S.	2019	Andrew J. Smye
Elastodynamic and Mechanical Properties of Smectite-Rich Fault Gouge	Kenigsberg, Abby	GEOSC	Geosciences	Ph. D.	2019	Demian Saffer
Relative Seismic Event Location and Size Estimation, Contributions to Earthquake Analysis and Seismic Discrimination at Local Distances	Kintner, Jonas	GEOSC	Geosciences	Ph. D.	2019	Charles J. Ammon
THE EFFECT OF LITHOLOGY ON (BIO)GEOCHEMICAL WEATHERING: SANDSTONE TO SERPENTINITE	Marcon, Virginia Margaret	GEOSC	Geosciences	Ph. D.	2019	Susan L. Brantley
THE REACTIVITY OF NITROGEN HETEROCYCLES IN COMPLEX PREBIOTIC MIXTURES: USING CHEMICAL TRENDS TO EVALUATE PLAUSIBLE STRUCTURES OF PRIMITIVE GENETIC MATERIAL ON EARLY EARTH	Rodriguez, Laura Elise	GEOSC	Geosciences	Ph. D.	2019	Christopher H. House
Morphological change in response to mass extinction: a case study of Strophomenida (Brachiopoda) at the Late Ordovician	Sclafani, Judith	GEOSC	Geosciences	Ph. D.	2019	Mark E Patzkowsky
UTILIZATION OF THE SQUARE ARRAY EARTH RESISTIVITY METHOD FOR CHARACTERIZING ANISOTROPY IN FRACTURED SEDIMENTARY ROCK	Yoxtheimer, David	GEOSC	Geosciences	Ph. D.	2019	Andrew A. Nyblade
Exploring how diagenetic alteration of marine carbonate sediments is accommodated in heterogeneous assemblages	Crist, Clarissa	GEOSC	Geosciences	M. S.	2020	Matthew S Fantle
Effects of evaporation, mineral precipitation, and brine evolution on the distribution of calcium isotopes in the Salar de Atacama, Chile	Estrada, Jennifer A	GEOSC	Geosciences	M. S.	2020	Matthew S Fantle
Magma-Faulting Interactions during the June, 2007 East Rift Zone Eruption of Kilauea Volcano, Hawai'i	Leeburn, Jeffrey	GEOSC	Geosciences	M. S.	2020	Christelle Wauthier
P-wave Velocity Structure of the Shale Hills Watershed, Pennsylvania	Ma, Lisa	GEOSC	Geosciences	M. S.	2020	Andrew A. Nyblade
Iceberg Calving and Meltwater Drainage at the Ice-Cliff Terminus of Helheim Glacier, Greenland	Melton, Sierra	GEOSC	Geosciences	M. S.	2020	Sridhar Anandakrishnan
Evolution of the Tungnárhraun mafic lavas: Insights into magma storage and ascent beneath Barðarbunga volcanic system	Oborn, Collin	GEOSC	Geosciences	M. S.	2020	Tanya Furman
Utilizing 234U/238U and 87Sr/86Sr to understand the provenance and fate of uranium in Shaver's Creek, Pennsylvania	Reinthal, Mary	GEOSC	Geosciences	M. S.	2020	Susan L. Brantley
Focused Flow Along Faults and Heat Advection in the Northern Hikurangi Accretionary Prism	Santos, Dorivaldo	GEOSC	Geosciences	M. S.	2020	Demian Saffer

Examining the Fidelity of Carbon Isotope Records in the Paleocene-Eocene Thermal Maximum	Ajayi, Oluwaseyi Adebola	GEOSC	Geosciences	Ph. D.	2020	Lee Kump
Post-depositional Alteration of Organic Material: Implications for Interpreting Molecular Biosignatures	Fox, Allison	GEOSC	Geosciences	Ph. D.	2020	Katherine H Freeman
The recovery of calcareous nannoplankton following the Cretaceous-Paleogene (K-Pg) mass extinction event 66.0 million years ago	Jones, Heather Louise	GEOSC	Geosciences	Ph. D.	2020	Timothy Bralower
The role of fire ecology in vegetation change during the Neogene: New applications of molecular and isotopic proxies for vegetation burning in the paleorecord	Karp, Allison	GEOSC	Geosciences	Ph. D.	2020	Katherine H Freeman
The Role of Petrogenic Carbon in Cenozoic Climate Events	Lyons, Shelby	GEOSC	Geosciences	Ph. D.	2020	Katherine H Freeman
bedrock fracture spacing controls on hillslope and channel erosion in steep landscapes	Neely, Alexander	GEOSC	Geosciences	Ph. D.	2020	Roman A Dibiase
CO2, O2, and the History of the Greenhouse Effect: Select Problems in the Evolution of Earth's Atmosphere and Climate	Payne, Rebecca	GEOSC	Geosciences	Ph. D.	2020	James Kasting
Geochemical investigations of continental rift magmatism: a case study in East Africa's Western Rift	Pitcavage, Erica	GEOSC	Geosciences	Ph. D.	2020	Tanya Furman
Body and Surface Wave Tomography of West Antarctica and Southern Africa: Implications for Lithospheric Architecture, Tectonic Development, and Geodynamics	White-Gaynor, Austin Laurent	GEOSC	Geosciences	Ph. D.	2020	Andrew A. Nyblade
Enhanced Evaluation of Martian Habitability in the Past and Present: The Search for Viable Electron Donors	Wong, Gregory	GEOSC	Geosciences	Ph. D.	2020	Christopher House
Shear Wave Velocity Structure of the Bushveld Complex, South Africa from a Joint Inversion of Receiver Functions and Rayleigh Wave Group Velocities	Contreras, Kaelie	GEOSC	Geosciences	M. S.	2021	Andrew Nyblade
Development of the Queen Charlotte Terrace in Response to the Initiation of Transpression Along the Queen Charlotte Fault at the Miocene-Pliocene Boundary	Cromwell, Copeland	GEOSC	Geosciences	M. S.	2021	Kevin P Furlong
Investigating nitrate transport and denitrification in hilly terrain from the scale of a single farm field to a HUC-10 watershed	Forgeng, Michael	GEOSC	Geosciences	M. S.	2021	Susan L. Brantley
Viscous Magma Injection into the Shallow Plumbing System of Telica Volcano, Nicaragua: Evidence from the 2011 and 2015 Eruptions	Garcia, Victor	GEOSC	Geosciences	M. S.	2021	Maureen Feineman
Seismic observations and velocity inversion from thunderquakes using an underground fiber optic array	Hone, Sam	GEOSC	Geosciences	M. S.	2021	Zhu, Tieyuan
The Environmental Origins of Cambrian Rhynchonelliform Brachiopods	Irizarry, Kayla	GEOSC	Geosciences	M. S.	2021	Patzkowsky, Mark E.
Efficient Maintenance and Distribution of the Comprehensive SETI Bibliography on the Astrophysics Data System (ADS).	LaFond, Julia	GEOSC	Geosciences	M. S.	2021	House, Christopher H.
Fluid-Rock Interaction at Sub-Arc Conditions : A Petrological Investigation of Eclogite Veins, Tauern Window, Eastern Alps	Mundell, Hailey	GEOSC	Geosciences	M. S.	2021	Andrew Smye

Characterizing Acoustic Emission Signals Throughout The Laboratory Seismic Cycle : Insights On Seismic Precursors	Bolton, David	GEOSC	Geosciences	Ph. D.	2021	Marone, Chris J.
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Geodetic Exploration of the Kinematics and Fault Slip Rates of the Southeastern and Western Caribbean Plate Boundaries and the Caldera Dynamics of the Sierra Negra Volcano..	Higgins, Machel	GEOSC	Geosciences	Ph. D.	2021	Peter LaFemina
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Changes in crystal structures of metal oxide/ hydroxide minerals during dissolution and heating : An In-situ synchrotron X-ray diffraction study	Chung, Dongyoun	GEOSC	Geosciences	M. S.	2022	Heaney, P. J. (Peter J.)
A U-Pb CA-ID-TIMS date (230.964 Ma ± 0.077 Ma) for the Maple Creek Gabbro, Wrangellia Large Igneous Province, Kluane Range, the Yukon	Grosswiler, Kate	GEOSC	Geosciences	M. S.	2022	Kelley, Brian
Lipid Biomarker Records of Environmental Conditions and Habitation During the Mid-Neolithic (Dalmatia Coast, Croatia).	Hartke, Emma	GEOSC	Geosciences	M. S.	2022	Katherine H Freeman
Seasonal lacustrine carbonate early diagenesis driven by microbial metabolisms in Green Lake, New York	Leapaldt, Hanna	GEOSC	Geosciences	M. S.	2022	Miquela Ingalls
Relative Source Time Functions, Spectral Ratios, and Spall for the Source Physics Experiment Phase I Explosions	Pippin, James	GEOSC	Geosciences	M. S.	2022	Charles J. Ammon
Tropical Temperatures during the Late Paleozoic Ice Age : Proxy Fidelity in Pennsylvanian to Permian Carbonates of the US Midcontinent Sea, Eastern Kansas	Shepherd, Garrett	GEOSC	Geosciences	M. S.	2022	Brian Kelley
Early Triassic weathering intensity and climate recovery after the end-Permian extinction	Taylor, Kaitlin	GEOSC	Geosciences	M. S.	2022	Kim Lau

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The Biogeochemical Cycling of Rare Earth Elements in the Modern and Ancient Oceans	Barnes, Benjamin	GEOSC	Geosciences	Ph. D.	2022	Lee Kump
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Fire, Climate, and Vegetation in Pleistocene East Africa : Insights from Bulk Organic and Compound Specific Indicators at Olduvai Gorge, Tanzania	Ferland, Troy	GEOSC	Geosciences	Ph. D.	2022	Katherine H Freeman
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Magma-tectonic interactions within Tanzania's Natron Basin constrained from satellite geodesy and seismicity	Ho, Cristy	GEOSC	Geosciences	M. S.	2023	Christelle Wauthier
Phase Identification of Phosphorus Uptake onto Carbonate Minerals in Coastal Wastewater Injection Zones	Meyers, Kate	GEOSC	Geosciences	M. S.	2023	Ingalls, Miquela
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A New Eoarchean Terrane in Arctic Canada : How Extensive is Acasta-like Crust?.	Stoian, Cristy	GEOSC	Geosciences	M. S.	2023	Jesse Reimink
Position-Specific Carbon Isotope Measurements of Phytane Using GC-Orbitrap MS and Peak Trapping	Volante, Paul	GEOSC	Geosciences	M. S.	2023	Freeman, Kate
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Origins of Icehouse Vegetation in Southern South America : Climate Change and Turnover in Eocene and Oligocene Patagonian Fossil Floras	Harris, Gabriella	GEOSC	Geosciences	Ph. D.	2023	Wilf, Peter
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Deep Learning in Data-limited Geophysics : Examples from GPR, Time-lapse Seismic, and Microseismic	Leong, Zi Xian	GEOSC	Geosciences	Ph. D.	2023	Zhu, Tieyuan
Application of uncertainty quantification, benchmarking, and model diagnostic tools to inform climate risk assessments	Ye, Haochen	GEOSC	Geosciences	Ph. D.	2023	Kasting, James F.

APPENDIX III: ORIGIN AND HISTORY OF THE HYDROGEOLOGY /ENVIRONMENTAL GEOLOGY PROGRAM AT PENN STATE

Richard R. Parizek

Hydrogeology at Penn State owes its origin in a curious way to the Servicemen's Readjustment Act of 1944, commonly known as the G.I. Bill. This Bill helped veterans of World War II re-adjust to civilian life by providing funds for college education, unemployment insurance, and housing. To accommodate this post-war influx of students Penn State built temporary classrooms, a temporary student union, pre-fab student housing (called "snob-knob or sewer valley" trailers), and demanded even more from its underfunded faculty and staff. University Park enrollment in 1944 was 3,071; by 1950 it had more than tripled to 11,132 and by 1961 enrollment was 15,500. The Borough and Campus water and sewer systems were quickly overwhelmed, and campus and State College Borough pollutants ran into Spring Creek and its tributaries, Slab Cabin and Thompson runs, all world-class cold-water fisheries. This led to a "Cease and Desist Order" that among other rulings capped projected future growth at 25,000 inhabitants.

The rapid growth of the campus and community also created a chronic strain on Penn State's water system and the State College Borough Water Authority[1] which relied on groundwater with additions from surface runoff in Shingletown Gap when rainfall permitted. Of 19 wells drilled in Spring Creek's karst headwaters (ordained by 400 acres and cash offerings that sealed the Farmers High School deal), only 5 (26 %) were usable. Four of 13 borough wells (30%) were in service entering the persistent northeastern drought (1963-69). Water imports from a reservoir on Spruce Creek (near Seven Stars) was under U.S.

[1] https://www.scbwa.org/sites/default/files/pages/history_of_state_college_water_system.pdf

Corp of Engineers consideration (but never realized). Bellefonte Big Spring was intended for sole use by Bellefonte residents and therefore was not an option. It seemed only sensible that the College of Earth and Mineral Sciences ought to look into the problem.

E.F. Osborn, Vice President for Research, envisioned a water research center in the Mineral Conservation Section (MCS), a state-funded unit within EMS tasked with supporting the education, research, and outreach mission of the Pennsylvania Geological Survey. Thus it came to pass that in the winter of 1961 I was interviewing for an appointment in hydrogeology in what was then the Department of Geology and Geophysics. The appointment almost didn't happen. My interview was preceded by a late-night bus ride from Pittsburgh that was delayed until 3:30 A.M. for snowplows to open Cresson Mountain. I arrived barely in time for breakfast at the Nittany Lion Inn and an 8 AM interview with Prof. Frank A. Swartz, Department Head. When asked about my presentation he said, "Talk about something else." Then he continued our interview as the "Judas goat" led "the lamb" to his 9:00 A.M. introduction in Steidle where upon he asked, "What are you going to talk about?" During my 52-year retirement gathering, Robert F. Schmaltz, my recruitment committee member, confessed that Prof. Swartz wanted to hire a stratigrapher/paleontologist not a hydrogeologist. Nevertheless, I was offered a joint appointment in the Mineral Conservation Section and the Department of Geology and Geophysics but with neither startup funds nor an office for months. My first course offering was the 1961 version of *Introduction to Hydrogeology*, one of the longest-lasting and largest such course in the nation. Two attendees were Ronald A. Landon (MS '63) and Frank T. Caruccio (MS '63), both of whom went on to distinguished hydrogeology careers. By spring '62 or '63 I began offering the nation's first environmental geology seminar (7 or 8 years before the first Earth Day). Its diverse real life case history approach helped develop the professional skills of the department's 100 MS and Ph.D. hydrogeology degree recipients. This would not have been possible without the help and support of Jean Gettig, Mim Johnson, Judy Bailey and other staff throughout the years. When asked "what's environmental geology", I replied that nearly half of our students will find such employment in the next 10 years.

By late September 1961, University President Eric Walker had authorized an interdisciplinary committee to address Penn State's cease and desist order concerning treated sewer water. Land treatment was considered the most viable option among suggestions provided. My role was to identify potentially suitable sites for an R & D project involving 20 percent of Penn State's secondary sewage effluent, and to develop and undertake a monitoring plan. Butts and Moore's 1936 geologic map of the Bellefonte Quad was available. It had a 20-foot contour interval and no outcrops. Preliminary soil maps were available, but no well or spring inventory or water table maps had ever been prepared. I completed my first soil- and rock-boring contract, requested bids, and the University awarded a contract to begin drilling in March, 1962. Landon's and Caruccio's thesis projects were approved as part of the study, and they began detailed geologic mapping later that spring. Arrangements were made to use a central portion of Gameland 176 that had thicker overburden and that was more remote from private wells. Land was purchased and deeded to the Commission as part of the agreement. Permits were acquired from the PA Department of Health, an effluent pump station and three miles of main were laid, and nearly 72 wells and springs were inventoried and 52 monitored monthly for quality in advance of the first application of effluent, April 1963. Winter experiments began in 1965. Land treatment of 100 percent (up to 4 mgd) of effluent began in 1983 and will be continued for the foreseeable future. The project has been called the Living Filter.

During the last 63 years dozens of students from various departments and their advisors have been engaged in thesis and dissertation projects that address emerging concerns of the Living Filter. Thousands have visited the site where billions of gallons of reclaimed water have been added to recharge. The longest standing interdisciplinary advisory committee still exists. It provides independent advice, and supervises graduate research projects and outreach efforts. The Living Filter is Penn State's longest standing pillar of sustainability and has served as a research facility for dozens of graduate students eager to address concerns.

The fracture trace method for groundwater exploration and geotechnical site characterization projects (Lattman and Parizek, 1964) was a direct outcome of the Living Filter project and is now used worldwide. The next 6 wells drilled for Penn State after 1962 and 9 drilled for the Borough of State College had an 83% success rate vs, 26% and 30% when using the random drilling method. The financial benefits are truly significant. Innovative soil-water sampling devices were created for the project. Unfortunately, patent applications were not encouraged then as now.

Dr. Osborn's expectation for a water resources center was not strictly realized, in part because the Civil Engineering Department Head stated, "We are the hydrogeologists". Fortunately, mutual understandings amongst faculty allowed students from various academic units supportive of Osborn's broader educational objectives to take one another's classes without the need for extensive prerequisites. Every MS and PhD hydro candidate was required to include a committee member from another academic unit as expected for a successful interdisciplinary academic program. A graduate program in Environmental Pollution Control was established some years later. It offered MS, M, EPC, and M. Eng. degrees both at University Park and Harrisburg campuses.

Penn State's hydrogeology/ environmental geology efforts prospered under this arrangement, supported by Deans and Department Heads and enriched by talented faculty. Donald Langmuir, geochemistry and aqueous chemistry, provided the aqueous chemistry lectures in GSci 452 and supervised aqueous chemistry advanced degrees. William B. White, Professor of Geochemistry continued aqueous chemistry lectures after Don joined the Colorado School of Mines. Will's graduate students were engaged in karst genesis, hydrogeology, and geochemistry and so much more. Later, James D. Kubicki taught the aqueous chemistry section,2010-15 before becoming Chair, Dept. of Earth, Environmental and Resource Sciences, University of Texas, El Paso. Art Rose served as the last Director of the Mineral Conservation Section. He was active in mineral exploration, acid mine drainage research and abatement, oil/gas field brine characterization, all important topics when addressing treatment or disposal of produced water and more recently, as potential sources for critical minerals and more. Eugene G. Williams, 1957-82, was engaged

in clay and coal depositional environments, clay and coal resources, mine acid drainage prediction and abatement and related mineral resource subjects. The implications of one's research are not always anticipated. Locating and characterizing high quality refractory clays had its industrial rewards. While researching if they were transported or soils weathered in place might be of academic interest, who would have anticipated, lithium clays one day might be a critical metal source for the energy transition? Barry Voight added a much appreciated engineering geology, volcanic, ice and rock mechanics direction to the hydro- and environmental geology program that complemented Civil Engineering soil mechanics classes. Land subsidence induced by fluid removal is predictable, of global concern and must be mitigated. Shelton Alexander, Peter Lavin, and Roy Greenfield and others in geophysicists engaged in and supervised research in characterizing the hydrogeologic framework of karst and other settings, delineating pollutant plumes and siting of critical facilities. With graduate students, they helped delineate overburden thickness for the Living Filter sites. Can you imagine an Office of Risk Management allowing faculty and students use dynamite as an energy source? The appointment of Susan Brantley strengthened the water research effort through class offerings, diverse research, thesis and dissertation supervision, together with program management. Noteworthy are contributions at the Shales Hills *Critical Zone* Facility, and many challenges related to production, characterization, and disposal of Pennsylvania's extensive fluids from non-conventional oil and gas operations.

Given the interest in the hydro-environmental geology degree program and rapidly developing job opportunities, a diverse research effort was encouraged. MS and Ph.D. degrees awarded can be broadly grouped by subject matter: Geologic controls on hydraulic properties, fracture flow, environmental geologic mapping, 20; karst hydrogeology, 9; numerical modeling, 10; mining, AMD prediction mitigation, 24; "sanitary" landfills, 2; geophysics, 4; Pleistocene/glacial geology, 5; streambed infiltration, 5; municipal wastewater treatment, 8; oil and gas, 2; radioactive wastes, 3; aqueous chemistry, 3; and radon, 3. Employment opportunities offer but another metric of program success: Academic positions, 14; USGS Research Hydrologists, 4; USGS 7; State Geologic Surveys, 4; Consulting Companies, 16;

Consulting Company owners, 13; International Gov. 3; Regulatory, 8; Oil/Gas, 3; Law, 1; Nuclear Waste Technical Review Board Staff, 1; Other, 8. Examples of their professional and/or academic achievements are noteworthy: R.E. Smith's, Petroleum and Natural Gas Engineers Annual Best Paper Award; R.E. Cooley. O.E. Meiser Award; W.F. Sanford, Young Scientist Award (Donath Metal), Geologic Society of America; T.H. Filley, Valor Award, U.S. Department of Interior are but a few.

Many students came from abroad and took their knowledge back to their respective countries, thereby opening up water resource programs globally. Of special note is former students' willingness to support the departments' education missions. Ronald A. Landon's Hydrogeology Scholarship, numerous donors who help vest the Richard R. Parizek Graduate Fellowship in hydrogeology and related fields and support R.R. Parizek's field programs rewarding student scholarship.

Water resource research, education and outreach needs will only increase in the future as the demand and scarcity of water increases driven by population growth, climate change, sea level rise, economic activity, over development and pollution concerns. Nearly all human activity in one way or another impacts water resources, availability and quality. However, cost effecti*ve* mitigation measures are not always obvious for addressing emerging, often unanticipated water-resource concerns. Interdisciplinary R & D efforts will be required to address growing environmental challenges. Acid mine drainage, geologic isolation of radioactive wastes, management of stormwater to enhance recharge, re-thinking and finding uses for abandoned and orphan oil and gas wells, waste recycling, environmental restoration, land subsidence and sea level rise are but a few examples.

APPENDIX IV

DEPARTMENT OF GEOSCIENCES
GOVERNANCE PROCEDURES, POLICIES, AND GENERAL PROCEDURES

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GOVERNANCE PROCEDURES

Approved by faculty May 1988
Modified: November 2000

Department Executive Committee

Membership: Department Head, two Associate Heads, the departmental representative to the College's Diversity Council, and two at-large members. The representative to the Diversity Council will be appointed by the Department Head and serve a two-year term, non-renewable. The at-large members will be elected by the faculty and serve a one-year term, non-renewable. At least one member of the committee, if possible, will be a tenure-track Assistant Professor. Representation of ranks by the at-large members will be considered by the faculty prior to the annual election.

Duties and Responsibilities: The Executive Committee is intended to advise and assist the Department Head in Department-wide activities. In general, this committee should have a responsibility to develop long-term plans on department growth, new research and educational initiatives and facilities, appoint faculty search committees, have major input in the selection of faculty members, develop policy for department-wide finances, and establish priorities for expenditures for department-wide purposes. The committee should be the conduit for expression of faculty concerns to the Department Head.

With regard to faculty hiring, a recommended procedure is for the Executive Committee, in consultation with the faculty and Department Head, to develop a long-range plan encompassing desirable characteristics of new faculty members, and to appoint faculty search committees, followed by faculty discussion of candidates after visits by prospective faculty, leading to recommendations to the Department Head and Executive Committee by the search committee and the faculty, followed by decision by the Department Head with approval of the Executive Committee. Another responsibility of the Executive Committee will be oversight on the promotion and tenure process

Graduate Program Administration

Associate Department Head for Graduate Programs & Research (AHG) (Graduate Chairperson)

Term of Office: 3 years, with possible re-election to a second 3-year term; can serve again only after at least a 1-year interval.

Selection Procedure: The elected members of the Graduate Program Committee will act as a Search Committee for this position and will elect a chairperson for this purpose.

From nominations submitted by the faculty or from nominations developed by the search committee, the committee will submit to the Department Head a list of at least 2 candidates from which the Department Head will appoint the Associate Head. A member of the committee may be a candidate for Associate Head, but cannot vote on his or her own election. If appointed as

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Associate Head, a committee member will be considered to have resigned as an elected member of the Graduate Program Committee, and a replacement shall be elected.

Duties:

- Has executive authority for all Graduate Program activities, including communications with the Graduate School, calling meetings of the graduate faculty to consider graduate program matters, certification of satisfactory completion of degree requirements, assignment of T.A.'s (in collaboration with Associate Department Head for Undergraduate Programs), appointment of R.A.'s with approval of project supervisors, assigning of student offices, scheduling of graduate courses and instructors (in consultation with Associate Department Head for Undergraduate Programs), and development of graduate courses and curricula (with advice of Graduate Program Committee).
- Chairs Graduate Program Committee.
- Appoints Initial Advisory, Candidacy, M.S. and Doctoral Committees, and the Admissions and other Graduate Program Committees with approval of the Graduate Program Committee.
- Administers annual review of student progress, and reviews at other times as needed. A clear timing and procedure should be developed for this review process in order to ensure that M.S. and Doctoral Committees are functioning to give the student clear and timely advice and recommendations.
- Coordinate acquisition, use and maintenance of department-wide research facilities, such as computers, field equipment, rock cutting and grinding equipment, etc. (in coordination with Department Head).
- The AHG should have adequate office and secretarial staff, a clear mandate from the Department Head, and an annual budget adequate to conduct a high-quality graduate program.

Graduate Program Committee

Membership: Associate Department Head (AHG, also serving as Graduate Chairperson) plus 5 elected members. In case of a tie vote, the vote of the AHG shall determine the decision. A non-voting student liaison shall also be elected by the graduate students.

Term of Office: 2 years, with re-election permissible up to a total of 6 years; an individual is then precluded from serving for at least 1-year. Terms are staggered so that three members are elected in the first year of a 2-year cycle, and two members are elected in the second year of the cycle.

Nomination and Election Procedure: A nomination by at least 4 faculty or the AHG or the Department Head is required, to be submitted to the AHG by March 31. An individual faculty member (other than AHG or Department Head) may not participate in more than one nomination in a given year. The permission of the candidate must be obtained at the time of nomination. The election is held in April, with all tenured and tenure-track faculty eligible to vote. The election procedure will be the Borda Method whereby each of N nominees is ranked by the voter as his or

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her 1st choice, 2nd choice, ... and N^{th} choices. A voter's 1st choice is given N points, his or her 2^{nd} choice is given N-l points, etc. The candidates with the most points win the election. Elected candidates take office on July 1. Should a member resign for any reason, a special election will be held to finish out his or her term of office.

Duties:

- Advise and assist the AHG and Department Head on all graduate program activities.
- Act as a Search Committee for the Associate Head for Graduate Programs.
- Approve (by majority vote) all appointments of Candidacy Committees, M.S. Committees, Doctoral Committees, Initial Advisory Committees, the Admissions Committee, and other committees considering Graduate Program activities.
- Approve specialized M.S. programs.
- Represent the Graduate Program on Initial Advisory Committees and the Admissions Committee.
- Annually review the progress of graduate students as documented by Initial Advisory, M.S., and doctoral Committees.
- Serve as appeals board for all other actions and decisions of AHG, by a majority vote (4 of 6 members). The appeal may be by a member of the Graduate Program Committee, a faculty member, or a graduate student.

Rationale: In view of the large size and diversity of the Graduate Program, this committee provides input and advice by a relatively large group of faculty representing the diversity of the faculty. This group will have a more detailed knowledge of the character of various sub-disciplines and the interests and strengths of various faculty and graduate students. In addition, the committee provides a balance to the relatively concentrated authority of the AHG and the Department Head, and a conduit for faculty input into the operations of the Graduate Program.

The procedure of electing two or three members by the Borda Method is intended to ensure that this committee will be more representative of the diversity of the faculty, and can discharge its responsibility for communicating the views, unique characteristics, and requirements of faculty and students throughout the department.

The requirement for approval of M.S., Doctoral and Candidacy Committees reflects the importance these committees should have in guiding the graduate education of a student. The Graduate Chairperson and the Graduate Committee must assure that these committees require high standards of graduate education and a balance of breadth and depth within the committee, as discussed below.

Admissions Committee

Membership: The Admissions Committee will consist of 5 members, which will normally include 2 members of the Graduate Program Committee, plus 3 graduate faculty selected to make the committee representative of as wide a range of sub-disciplines as possible. A Chairperson of the Admissions Committee will also be designated and will be responsible for administering the evaluation of dossiers and chairing the deliberations of the committee. Each applicant will be evaluated by at least 2 members of the Admissions Committee plus 2 or more

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other Graduate Faculty selected by the committee and representing sub-disciplines of interest to the student.

After evaluation, the Admissions Committee will consider each applicant and recommend action to the AHG. The selection of students offered admission with or without support will be based on a weighting of potential for success in the program, balance of advisees among faculty, and financial resources for support. Guidelines for weighting these factors should be furnished to the Admissions Committee by the Graduate Program Committee. The AHG will then act on the committee's recommendation, though he or she is not required to accept the committee's recommendation. The Graduate Program Committee is available to serve as an appeals board for any faculty member who perceives unwise decisions by the AHG or Admissions Committee.

Rationale: The evaluation and rating of applicants should be conducted at least partly by faculty in the sub-disciplines of interest to the applicant. Based on this evaluation, the Admissions Committee must rank all applications, in a manner similar to the present Admissions Committee of the three graduate programs, taking into account the factors listed above. The AHG also serves as a second level of judgment on the proper weighting of the various factors, analogous to the current program chairman and graduate coordinator.

Undergraduate Program Administration

Associate Head for Undergraduate Program (AHU)

Term of Office: 3 years, with the possibility of a second 3-year term, after which at least 1 year must pass before further services.

Method of Selection: The elected members of the Advisory Committee for Undergraduate Programs will act as a Search Committee for this position. The members of the Search Committee will elect a Chairperson from this group.

From nominations submitted by the faculty or from nominations developed by the Search Committee, the committee will submit to the Department Head a list of at least two candidates from which the Department Head will appoint the Associate Head. A member of the committee may be a candidate for Associate Head, but cannot vote on his or her own nomination. If appointed as Associate Head, a committee member will be considered to have resigned from the Committee, and a replacement shall be elected.

Duties: The Associate Department Head for Undergraduate Programs will chair the Undergraduate Program Committee and administer all activities of the undergraduate program, including:

- Supervision of course offerings and registration activities, including apportionment of senior thesis advising and evaluation.
- Assigning of teaching responsibilities (in coordination with the Associate Head for Graduate Programs in order to balance teaching loads).

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- Organization and supervision of the undergraduate advising system including 6th semester monitoring of student progress in relation to stated program requirements.
- Assignment of Teaching Assistants to undergraduate courses, in collaboration with the Associate Head for Graduate Programs.
- Development and modification of curricula and courses as needed.
- Promotion of undergraduate enrollment and of undergraduate non-course activities, including recruitment of new majors through outreach activities such as EMEX, Spend A Summer Day, and Freshmen Seminar presentations.
- Participation in selection of scholarships, awards and aid to undergraduate students.
- Calling meetings of faculty to discuss undergraduate program matters.
- Annual assessment of the undergraduate program as directed by the Office of Undergraduate Education.

Undergraduate Program Committee (UPC)

Membership: Associate Head for Undergraduate Programs (AHU) plus four elected members. A non-voting student liaison member shall also be elected by the undergraduate students.

Term of Office: Two years, with re-election to a maximum of 6 years; further service requires a waiting period of at least one year. Terms are staggered as described below.

Nomination and Election Procedure: Candidates may be nominated to the AHU by four or more faculty members, by the Department Head, or by the AHU. An individual faculty member may not participate in more than one nomination in a given year. Permission of the nominee must be obtained by the nominators. Two faculty members are elected each year. Election procedures are identical to those for GPC.

Duties: This committee will assist and advise the Associate Head for Undergraduate Programs on all matters involving the Undergraduate Program, including the following duties of the AHU:

- Oversee the advising system for undergraduates.
- Monitor student progress annually.
- Certify completion of degree requirements.
- Approve petitions for exceptions to degree requirements.
- Oversee teaching of core courses.
- Oversee General Education Courses taught in Department.
- Develop and oversee undergraduate thesis procedures.
- Develop and modify curricula.
- Select recipients for scholarships and awards.
- Serve as appeals board for actions of AHU by majority vote (3 of 5 members). The elected members of this committee will also act as a search committee for the Associate Head for Undergraduate Programs.

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Faculty Meetings

Frequency: Faculty meetings are called by the Department Head and normally should be held monthly during the academic year. Special faculty meetings may be called by an Associate Head, by a majority vote of the Executive Committee, or by petition by a minimum of 10 Voting Faculty members. An agenda for all meetings should be distributed no later than 3 days before the meeting.
Quorum: A quorum at a meeting is achieved when one-half of the tenure-line faculty members are present at the meeting or represented by proxy.
Voting Faculty: Voting faculty as defined here includes those with academic ranks of assistant, associate, or (full) professor, and their instructional or research equivalents according to Penn State policy HR-21: lecturer, senior lecturer, research associate, senior research associate, senior scientist, and the equivalent librarian ranks. All faculty members will have full voting privileges at faculty meetings. However, the department head may call for a separate discussion and vote of the tenured and tenure-track faculty members. This would normally be restricted to personnel decisions (e.g, hiring) concerning tenured or tenure-track faculty members.
Graduate Student Representatives: Two Geosciences graduate students shall be provided by the graduate student body as non-voting representatives to faculty meetings. They will be free to participate in all discussions except personnel matters or other matters deemed confidential by the Department Head.
Method of Voting: A quorum of the voting faculty must be present for a vote to occur. All personnel-related votes must be taken in writing and be approved by a super-majority of 2/3 of the voting faculty present at the meeting. A simple majority vote will be accepted in all other cases. Other votes may be by show of hand or declaration.
Parliamentary Procedure: Normally Roberts Rules of Order will be followed except where they conflict with other provisions of this document.

Approved by the Faculty on 13 November 2015

Changes to the Governance Procedures

Any significant changes in degree requirements and departmental procedures and organization shall have the approval of the faculty.

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DEPARTMENTAL POLICIES

Graduate Faculty Appointment

(Guidelines for nomination to Graduate Faculty membership are available at http://www.gradschool.psu.edu/faculty-and-staff/faculty/criteria/

Geoscience faculty members who hold courtesy or fixed-term appointments or who hold appointments on the faculty of our commonwealth campuses may be recommended for membership in the Penn State Geosciences Graduate Faculty. Nomination is most appropriate for qualified individuals who will make a sustained, substantial and broad contribution to graduate education in Geosciences. The nomination should follow the guidelines provided by the Graduate School. Nominations may be submitted by either two members of the Geoscience Graduate Faculty serving as advocates or by the Department Head. The nomination is evaluated by the Geosciences Graduate Program Committee, which will make a recommendation to the faculty. With approval of the departmental faculty, the Geoscience graduate program head recommends the candidate to the Graduate School; the recommendation must be approved by the department head, the corresponding college evaluation committee, college dean, and the Dean of the Graduate School.

Approved by the Faculty on 16 April 2007

Approved as modified by the faculty on 12 November 2015

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Graduate Students and Postdoctoral Associates as Instructors

Experience as classroom instructors is an important part of the professional development of graduate students and postdoctoral associates. This experience can be gained in a number of ways, but with some restrictions that ensure the quality of the Departmental educational offerings:

- A graduate student may serve as a teaching assistant under the supervision of the faculty instructor during the academic year or summer.
- A graduate student may serve as the primary instructor for a module (1-2 weeks) under the direct supervision of the faculty instructor during the academic year or summer.
- A post-comprehensive Ph.D. student may serve as the primary instructor of a 0xx-1xx-level class (online or face-to-face) during the summer.
- A postdoctoral associate may serve as the instructor of an undergraduate course during the academic year or summer semesters under the mentorship of a faculty member.

Approved by the faculty, May, 2012

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Faculty Annual Performance Evaluation (Tenure Line)

Purpose: This yearly evaluation is to provide a relative measure of an individual's contribution towards the Department's mission and will be used by the Department Head for the purpose of rewarding merit and to provide feedback to each faculty member on his or her performance of duties as perceived by the Department Executive Committee and the Department Head. This evaluation will be used by the Head in making recommendations to the Dean of the College of Earth and Mineral Sciences with regard to annual compensation increases, when available. It also will be used for other Considerations, including making committee and other assignments, projecting future needs, and allocating Departmental resources.

Evaluators: The evaluation will be conducted by the Head, with the advice of the Tenured and Tenure-Track Faculty Evaluation Committee (subsequently referred to as FEC) shall be composed of all tenured members of the Department Executive Committee, supplemented by two additional tenured faculty members, selected by the Department Head to provide disciplinary balance to the evaluation committee and to ensure that all faculty participate in the process as frequently as possible. The FEC will fully participate in evaluating all faculty, with the exception of themselves, in accordance with the procedure outlined below. However, the recommendations of the FEC are advisory only, and the Head will have discretion over the final evaluations.

Procedures: Three areas of effort are to be considered: teaching, research, and service to the university, profession, and society. It is recognized that as long as the Department maintains an overall balance in these efforts, individuals can emphasize one or more of the categories over the other(s). There will undoubtedly be cases where teaching and/or service will be more heavily weighted (e.g., in the case of Associate Head for Undergraduate Programs, etc.) as well as when research effort will prevail (e.g, particularly for sabbatical leave but also in cases of heavily funded research efforts with considerable release time).

Every two years in a memo to the Department Head, each faculty member will state the weightings he or she would like to have applied for the next two-year period. The following rules apply: research shall constitute not less than 40% and teaching shall constitute not less than 30% of a faculty member’s time. Service shall constitute not less than 10% nor more than 20% without special arrangement with the Department Head. If no memo is received, the default proportions of 50-40-10 will be used.

Criteria: The following description of an ideal professor in the Department presents the criteria that will be considered by the FEC and sets the standards towards which we all can aspire. Of course it should not be construed as a rigid formula because none of the items is a necessary condition; it is the ensemble that matters.

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Criteria for Teaching Performance

An excellent teacher is one who:

- teaches >13 credit hours per year to classes meeting the Department requirements for enrollment
- is an effective teacher as measured by SRTE scores that are consistently above the average for faculty in the College of EMS and by scores on the Department Survey consistently of B or better
- advises >2 graduate students
- mentors undergraduates by supervising more than one senior thesis or by including them in research group activities and by involving them in funded research projects
- develops new courses or new classroom methodologies
- obtains external funds to improve teaching/learning or develop new courses
- teaches laboratory sections or closely supervises TA through frequent classroom visits and pre-lab discussions

Criteria for Research Performance

An excellent researcher is one who, on an annual basis:

- publishes significant papers and books, some first-authored, that establish the author as a rec
- recognized leader, expert, or innovator in the profession
- maintains a research program with high national and international visibility that attracts out
- standing graduate students, visiting scientists, and post-doctoral scholars
- provides RA support for more than two students each year over the past two years
- acquires funding for multiple grants and/or has multiple proposals pending
- receives invitations to speak at national/international meetings
- receives invitations to speak at departmental colloquia across nation
- presents or contributes to multiple abstracts at national/international meetings

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Criteria for Service Performance

A professor providing excellent service to his or her university1, profession, and society is one who:

- serves on and in particular, chairs national or international government or professional scientific committees
- serves on and in particular, chairs university committees
- serves as an administrator or Faculty Senate officer in the university
- serves as an editor or associate editor for professional scientific journals
- reviews many proposals for funding agencies and manuscripts for professional scientific journals
- is an officer in one or more professional scientific societies
- organizes meetings, workshops, and short courses for professional societies
- provides public outreach

Data: The following information will be used by the FEC in arriving at its evaluations:
Faculty Activity Summary (FAS-this document is to be submitted annually to the EMS Dean by each faculty member, with a copy to the Department, and is the primary basis for evaluation. Faculty should note each criterion as outlined in the previous section and include the relevant information in the FAS. Information for which there is no obvious section on the FAS form, such as names of undergraduates included in research projects, should be entered under the section most closely related. Be sure to document the ways in which you have improved teaching/learning and the specific proportions of time spent in the class room if team teaching and the proportion of time you spent in lab. Include the names of post-doctoral associates working with you, committees on which you have served over the past year, and specific numbers of proposals reviewed for funding agencies.

Departmental Data on Teaching—the Department will compile a record of all courses taught (and sections), numbers of students in each course, assignment of advisees, senior thesis advisors, and responses of present Geosciences and Earth Science majors and recent graduates to the Departmental Review form (evaluation of Departmental educational programs). These data will be used in evaluating teaching contributions and effectiveness.
University SRTEs—the department will compile these data annually.

1 University as used here includes department and college level units.

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Salary Release and Overhead Return—the department will compile these data annually.

Graduate Student Support Database —prepared by the Associate Head for Graduate Programs

Period Considered: The evaluation will use the last 2 years of the above data with emphasis placed on the current fiscal year of the evaluation. This is done in the recognition of vagaries of funding, students, and available monies for raises.

Timing: The evaluation will take place in April after all data are compiled. This will also require that faculty submit their FAS no later than April 15th to the Department. Late submissions cannot be considered.

Procedure: Each member of the FEC will be provided with a copy of the data listed above. The evaluators will grade all faculty in each of the three categories using a scale of 1 to 4, where a 4.0 indicates an individual personifies the ideals described above. A summary score will be computed by multiplying each category score by each individual's weighting factors. The FEC will then meet with the Head to discuss the results and provide an initial ranking of faculty on the basis of the composite scores of the 5 evaluators.
Feedback: Following the completion of the evaluation, the Head will prepare a written evaluation for each faculty member providing them with his or her ranking. Although there is no formal procedure for "negotiating" the results, the Head will consider reasonable appeals and/or requests for illumination.

Approved by the faculty, March 1999

Modified December, 2012

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Teaching Load (Tenure-Line)

The expected teaching load for tenure-line faculty in the Department of Geosciences is four three-credit courses per year (12 credits)[2],[3]. Faculty can make up these credits through any combination of lecture-, seminar- online-and field-based courses as long as they meet minimum enrollment levels (8 students for 0-400-level courses and 5 students for 500-level courses). Faculty receive credit for team-taught courses as follows: 75% for a course or seminar taught by two faculty and 40% for a course or seminar taught by three faculty. Every week of instruction at field camp counts for 25% of the total 6 credits. Faculty may buy out from teaching a course by releasing enough salary from a research grant to hire a PhD-level instructor as a replacement.

Faculty who direct vigorous research programs and/or who are heavily engaged in service qualify for a three-credit reduction per year, i.e. from 12 to 9 credits. The criteria for research vigor include a vital publication record, serving as PI or co-PI on federal-, state-, or industry-funded research programs, and supervising undergraduate and graduate students and postdoctoral associates. The criteria for service engagement include membership of departmental, college and university committees, advising undergraduates, mentoring of junior faculty, involvement in diversity initiatives, journal editorships and associate editorships, leadership in professional societies, and membership of government and professional panels.

Approved by the faculty, April 2010

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[2] New tenure-track Assistant Professors teach two courses in their first year and receive one semester off teaching in the year prior to tenure. These reductions lower the expected teaching load accordingly.

[3] Department administrators including the Head, Associate Heads and Center Directors receive a one course per year reduction in teaching load.

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Graduate Student Support

The Department of Geosciences strives to support all graduate students in good standing. We will support graduate students on Teaching Assistantships (TA) upon request, when funds are available. The need for a TA in a given course is identified by the Undergraduate Program Head. The Graduate Program Head will approve TA support to specific graduate students and assign TA duties to specific courses.

We believe that graduate students should have both a strong connection to funded research and high quality, mentored teaching experiences. Therefore, our goal is for students to be supported by a combination of TA and Research Assistantships (RA) during their graduate student tenure. Teaching assistantships will be provided to graduate students based on a variety of factors, including academic performance and length of time in degree program. When RA funding is not available, priority for TA funds will go to students of Assistant Professors, faculty who maintain a strong ratio of RA to TA support within their research group, and to faculty with strong track records of funded research and mentoring of graduate students. TA funds will normally support students working with tenure-track faculty, although students working with other faculty may receive support. The Graduate Program Head and the graduate admissions committee will work closely to ensure that students are admitted into active, well-funded research groups, and to minimize the chances of admitting students who will be supported solely or primarily via teaching assistantships during their tenure. Our expectation is that TA funding will normally constitute no more than 50% of the support a student receives during their graduate studies.
Approved by Faculty on October 17, 2013

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Peer Evaluation of Teaching

Schedule: Evaluation of tenure-track Assistant and Associate Professors will take place at the beginning of their second year and in the third and fifth years of their appointment. Evaluation of fixed-term Professors will take place at the beginning of their appointment and every third year thereafter. Tenured faculty will be reviewed in the years prior to promotion and fifth-year post-tenure review.

Committee: New professors will be assigned a teaching committee to give them advice and information about on-campus resources. Faculty may also request informal classroom evaluations that do not become part of their file.

Review Panel: Two Associate or Full Professors appointed by the Department Head

Review Process and Report: The individual under review will meet with her/his committee at the beginning of the academic year. This forum will establish expectations and guidelines for the review. The goal of the review process is to evaluate teaching ability and effectiveness. The criteria for evaluation will depend on class size and type, pedagogical styles, and characteristics of the learners. While there are no universal criteria for the evaluation of teaching, certain factors are considered common to many teaching situations. For traditional resident courses, these include adequate background preparation of lecture materials, the ability to articulate the main themes of a lecture, willingness to help students, and the ability to engage students in critical thinking, as evidenced by attention to- and participation in the classroom. For on-line and e-education courses the same factors will be considered, including adequate background preparation of on-line materials, the ability to convey the main themes via a well-designed web site, willingness to help students via discussion boards and/or chat sessions, and the ability to engage students in critical thinking as evidenced by meaningful exercises, logical progression of concepts, and stimulating, on-line discussion sessions.

The individual will provide the committee with a syllabus for each class. Committee members will arrange to visit at least one class session each semester.

Each committee member will write an evaluation of the teacher's performance. The report will include two parts: 1) an evaluation of the candidate's teaching strengths and weaknesses, and 2) suggestions as to how the candidate might improve or enhance his/her teaching skills and performance.

The evaluation will be given to the candidate and it will become part of his/her dossier.

Revised Version Approved April 13, 2010

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Promotion and Tenure

Criteria

Working within the framework established by University regulations (HR-23) and the College of Earth and Mineral Sciences (as detailed in the statement of Criteria to be used for Promotion and Tenure), the Faculty Promotion and Tenure Review Committee in the Department of Geosciences will base its recommendations on the scholarly achievements of the faculty members. This concept, in our interpretation, encompasses research, teaching, and other scholarly services to the academic community and society, and involves quality as well as quantity of scholarly production, as reflected by peer-reviewed publications. The most critical measure in our evaluation will be the individual's impact on science and higher education, i.e. his or her impact on students, colleagues, departmental programs, and field of specialization. We wish to promote and reward those who excel in their academic work and thus serve to uphold or enhance our reputation as a distinguished Department of Geosciences.

The Committee's recommendations will be based on merit, not on seniority, although it must be recognized that protracted diligence is required to establish a reputation meeting the criteria set forth above.

Although it is recognized that the composition of the faculty, in the long range, is affected by budgetary factors or the evolution of new educational trends, these factors will not be considered in tenure and promotion recommendations.

Thus, the three main criteria are teaching ability and effectiveness; research, creative accomplishment and scholarship (including, where appropriate, the scholarship and research of geoscience pedagogy); and service to the University, the public, and the profession. The relative weighting given to these three criteria may vary amongst individuals and through a faculty member's career.

Revised and approved by the Geosciences Faculty, September 14, 2010
Ratified by the Geosciences Faculty on September 8, 2011
Ratified by the Geosciences Faculty on September 6, 2012
Ratified by the Geosciences Faculty on November 14, 2013
Ratified by the Geosciences Faculty on September 11, 2014
Ratified by the Geosciences Faculty on August 27, 2015

Selection of College and Departmental Committees

There shall be a single departmental committee to consider matters of promotion and tenure of tenure-line faculty members on the University Park Campus. This committee shall be composed of five tenured faculty members elected by the tenure-line faculty. At least three must be at the rank of professor. Three members of the committee shall be elected each year. The two eligible faculty members who receive the most votes will serve two-year terms; the third will serve a one-year term. After completion of a two-year term of service, the member may not serve on the departmental promotion and tenure committee for the following two years. Each faculty member may vote for two committee members in the election. The Chair of the committee shall be elected annually by the membership of the committee. The Head of the Department of Geosciences shall

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be excluded from membership on the committee.

The departmental representative to the College Promotion and Tenure Committee serves a three-year term. Therefore, every three years an election for this position shall be held with votes being cast by all tenure-line faculty, with the Department Committee Chairs from two, three, and four years prior as candidates for election to the College P&T Committee. For example, in Spring 2016 the Departmental Committee Chairs from spring 2012, 2013 and 2014 will form the slate of candidates. The candidate with the most votes will be appointed to a three-year term. At the discretion of the Department Head, the serving chair could be reappointed to serve a second term.

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Promotion (Fixed Term)

Purpose: Working within the framework established by University regulations (HR-21, -23, -24) and the College of Earth and Mineral Sciences guidelines for the Fixed Term and Research (FT&R) Faculty (hereafter Document A), the Faculty of the Department of Geosciences wishes to establish criteria and procedures for professional advancement of outstanding faculty members who are not eligible for tenure.

Personnel Covered: This procedure applies to all FT&R faculty members who have a continuing, mission-defined status, i.e., with titles of equivalent rank to assistant professor, associate professor, or professor (research associates or lecturers, senior research associates or senior lecturers, senior scientists or professors of practice).

The Department recognizes three mission-defined appointments for which expectations for promotion will differ: 1) Research, 2) Instruction, 3) Joint (research, teaching, and service). Assignment to one of the above appointments, and the details of the job description and duties, are determined at the time of employment by the Head of Department and Dean. Job descriptions may evolve with time, and are given explicitly in the annual performance evaluation statements.

Expectations

Research Appointments

For those with research appointments, a record of accomplishment is expected in research and service. Working within the framework established by University and College regulations (HR-21, -23, and the College's *Fixed Term & Research Faculty Advisory Committee Promotion Guidelines Document*), the evaluation committee will base its recommendations on the scholarly achievements of the faculty members guided by the job description of the appointment. This concept, in our interpretation, encompasses research and other scholarly services to the academic community and society, and involves quality as well as quantity of scholarly production. The most critical measure in our evaluation will be the individual's impact on science, i.e., his or her impact on the field of specialization, colleagues, departmental programs, and students. We wish to promote and reward those who excel in their academic work and thus serve to uphold or enhance our reputation as a distinguished Department of Geosciences.

The Committee's recommendations will be based on merit, not on seniority, although it must be recognized that protracted diligence is required to establish a reputation meeting the criteria set forth above. Although it is recognized that the composition of the faculty, in the long range, is affected by budgetary factors and the evolution of new educational trends, these factors will not be considered in promotional recommendations.

Thus, the two main criteria are: 1) research, creative accomplishment and scholarship and 2) service to the department, the public, and the profession.

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Instructional Appointments

For those with instructional appointments, a record of accomplishment is expected in teaching and service. Working within the framework established by University and College regulations (HR-21 and the College's *Fixed Term & Research Faculty Advisory Committee Promotion Guidelines Document*), the review committee will base its recommendation on the scholarly achievements of the faculty member, guided by the job description of the appointment. Specifically, the committee will consider the following criteria: (1) demonstrated effectiveness and productivity in the practice of teaching and learning; (2) contributions to the literature on teaching and learning; (3) evidence of impact beyond Penn State; and (4) participation in College and University service. The most critical measure in our evaluation will be the individual's impact on higher education, i.e., his or her impact on students, colleagues, departmental programs, and field of specialization. We wish to promote and reward those who excel in their academic work and thus serve to uphold or enhance our reputation as a distinguished Department of Geosciences.

The committee's recommendations will be based on merit, not on seniority, although it must be recognized that protracted diligence is required to establish a reputation meeting the criteria set forth above. Although it is recognized that the composition of the faculty, in the long range, is affected by budgetary factors and the evolution of new educational trends, these factors will not be considered in promotional recommendations.

Thus, the two main criteria are: 1) demonstrated effectiveness and productivity in the practice of teaching, and 2) service to the College and University.

Joint Appointments

A record of accomplishment is expected in multiple areas of assignment. Working within the framework established by University and College regulations (HR-21 -23, and the College's *Fixed Term & Research Faculty Advisory Committee Promotion Guidelines Document*), the review committee will base its recommendations on the scholarly achievements of the faculty members, guided by the job description of the appointment. This concept, in our interpretation, encompasses research, teaching, and other scholarly services to the academic community and society, and involves quality as well as quantity of scholarly production. The most critical measure in our evaluation will be the individual's impact on science and higher education, i.e., his or her impact on students, colleagues, departmental programs, and field of specialization. We wish to promote and reward those who excel in their academic work and thus serve to uphold or enhance our reputation as a distinguished Department of Geosciences.

The Committee's recommendations will be based on merit, not on seniority, although it must be recognized that protracted diligence is required to establish a reputation meeting the criteria set forth above. Although it is recognized that the composition of the faculty, in the long range, is affected by budgetary factors and the evolution of new educational trends, these factors will not be considered in promotion recommendations.

Thus, the three main criteria are teaching ability and effectiveness; research, creative accomplishment and scholarship; and service to the University, the public, and the profession.

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Selection of Committees: The promotion committee will consist of the Geosciences Promotion and Tenure Review Committee for tenure-eligible faculty in the Department of Geosciences plus a non-tenure track joint appointment faculty member of higher rank if possible from the Department, otherwise from the College of EMS (hereafter P&T+1).

Frequency of Reviews and Initiation of Promotion Procedures: FT&R faculty will be reviewed every year by their supervisors, as required by College policy. The supervisor for those faculty of rank equivalent to professorial ranks will be the Department Head.

Procedures: Promotion to or beyond the equivalent rank of assistant professor requires recommendation by the P&T+1 Committee as appropriate, and a recommendation from the Department Head to be forwarded to the College FT&RP Review Committee, and then to the Dean for approval. Any level of review may recommend to not promote a candidate, but the candidate's file must proceed to subsequent levels unless the candidate elects to withdraw.

The Promotion Dossier: The College's Fixed Term and Research Promotion Guidelines will be followed. Those guidelines state that the dossier consists of the most recent annual review and preceding reviews, a précis that includes a brief summary of the past six (sic) years of contributions, the supervisor's and/or unit leader's recommendation, and external letters of support. Specifically, the dossier should include:

- Part A - Personal Statement (The argued case for promotion and the specific plans for continued development)
- Part B – Curriculum vitae
- Part C – Unit leader Statement (Department or Institute Head)
- Part D – Letters of Support from areas relevant to the position (Letters of support will be solicited by the unit head in cooperation with the candidate. Letters may be internal or external, depending on the scope of the candidate's work. Three to four letters are recommended.)
- Part E – Other summative evidence from previous year's reviews

The P&T+1 Committee Chair will prepare: 1) a summary document on each candidate for promotion, indicating the overall vote of the committee and 2) a brief statement as to why that candidate is or is not being recommended. The Department Head will evaluate the recommendations of the Committee, prepare a memo for each candidate containing his or her recommendation, and forward the recommendations for promotion to the College FT&RF Promotion Review Committee for consideration. Following evaluation and determination of promotion eligibility, the Head of Department and supervisor/mentor will meet with the candidate to orally review the Committee's evaluation.

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Important Dates: The following dates are offered as a guide:

October 1	Dossier made available to the Head of Department for consideration by the Promotion Committee
December 15	Promotion Committee Chair provides the committee's recommendations to the Department Head
January 2	Department Head forwards dossiers and accompanying documents to the Dean
May 31	Candidates notified of the result

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DEPARTMENTAL PROCEDURES

Colloquium Speaker Meal and Alcohol Allowance

When hosting a meal for a colloquium speaker the meal allowance is $41/per person (including tip) and $14/per person for alcohol. Any overage of the above allowances may result in a payroll deduction. Please limit your meals to 5 or fewer people including the visitor and always get an itemized receipt.

Office and Laboratory Space Allocation

The allocation of office and laboratory space in the Department of Geosciences ultimately is the responsibility of the Head of Department who must respond to the requests and demands of the Dean of the College. The distribution of office space among faculty, students, postdoctoral researchers, visitors, Commonwealth Campus faculty and administrative and research staff may change as the needs of the Department change. The Associate Head for Graduate Programs is responsible for the assignment of rooms to the graduate students from among those allocated by the Head of Department for graduate student use. The University standard for Assistant, Associate and Full Professors office space is 150 sq. feet, approximately the size of the offices on the west side of Deike Building. When available, senior faculty may occupy larger offices; priority will be based on years served and University and national recognition such as distinguished or Evan Pugh professorship, membership in the National Academy, etc. Occupancy in these larger offices is a privilege and is limited. Laboratory space is communal and subject to reassignment by the Head of Department based on evolving research needs of the Department. Preference for laboratory space reassignment and renovation will go to those faculty promoting the shared use of facilities.

Emeritus Faculty Privileges

In addition to the privileges described in policy **HR25 Emeritus Status**, emeritus faculty in the Department of Geosciences will be afforded the following privileges by the Department, *contingent upon availability*:

- Continued participation in Department faculty meetings and other Departmental functions as before retirement, but without voting rights.
- Continued access to computer support technical staff.
- For up to one year following retirement, continued occupancy of the faculty member's assigned office;
- After one year, access to emeritus community office space;
- In the unusual case where emeritus faculty have continuing sponsored projects run through the University, access to necessary laboratory space and equipment and administrative support of those projects, recognizing that said space and equipment likely will be repurposed for use by active faculty and students.
- Any materials not directly related to active research must be removed from all laboratory or storage spaces previously occupied.
- Any arrangement for continued use of space and services will be reassessed on an annual basis.

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It is the University's practice to extend liability coverage to emeritus faculty when they are asked by the University to participate in University-sponsored activities. Emeritus faculty will be subject to all applicable University policies.

Computer Replacement

The Department of Geosciences will match the College contribution to the replacement of personal-use computers following the College procedure and guidelines for frequency and cost of replacement.

Research Incentive Funds

At the discretion of the Head of Department, a fraction of the Research Incentive funds provided to the Department will be provided to departmental faculty in proportion to their generation of RIF funds through their sponsored projects in the previous year. Multi-PI projects will be credited to each co-PI as a fraction of the total number of Departmental co-PIs on the project. The use of these funds must be in accordance for the rules set forth for the use of general funds and the guidelines for RIF use set out by the Provost.

Department Funding of Field Trips

The Department of Geosciences strives to provide funding for field trips that are embedded within courses offered by the Department as well as special field trips not associated with courses. Priority for funding will go to embedded field trips and to trips that are consonant with the source of funding, typically oil and gas industry sponsors.

Courses that have an embedded field trip of at least 5 days duration with at least 8 students enrolled will be provided supplemental funding, if available. For each Geosciences or Earth student, the Department will strive to contribute up to $500 of match to student contributions for travel related expenses (including transportation, food and lodging, fees and other on-site expenses) and will cover the reasonable travel costs of the faculty member leading the trip. Travel support for an additional faculty member will be provided for trips with more than 12 student participants.

Requests for field trip support should be made to the appropriate Associate Head at least one semester in advance of the semester in which the course for which field trip is embedded is offered. The Associate Head will make a recommendation to the Head of Department for final approval. The Head of Department will receive special field trip requests directly.

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Department Reimbursement Policies for Graduate Student Hosting of Visiting Students

Geoscience graduate students may be asked to host visiting students as part of Department- sponsored activities or programs (e.g., Prospective Graduate Student Weekends). Reimbursement guidelines for expenses incurred by the graduate student as part of the hosting responsibilities are as follows:

1. Only meals are reimbursable; alcohol and entertainment are not allowable expenses.

2. Per meal reimbursement is limited to the visiting student, the host Geosciences graduate student and a maximum of one additional Geosciences graduate student.

3. Meal costs should not exceed $20.00 (including tip) per person for each meal.

4. A grocery store receipt is acceptable in lieu of restaurant meal expenses, but should not exceed the $20.00 per person limit (Item 3) and the limit on the number of persons (Item 2).

5. An itemized receipt, along with the names of the persons whose meals are covered by the receipt, are required for reimbursement.

6. The itemized receipt and the list of meal attendees covered by the receipt must be attached to a completed and signed Group Meal Form and submitted to the Department's Financial Assistant in 503 Deike.

Guidelines for Leaders of and Student Drivers on Field Trips Basic

Driving Requirements:

1. Must have a successfully completed the Motor Vehicle background checks (ALL students) please see Tina Vancas (505 Deike) for paperwork
2. Must be an employee, paid specifically to drive on the field trip
3. Must be 21 or over
4. Must have a valid US driver's license
5. Must take the maxivan online course
6. Must be present for the vehicle sign out and inspection
7. Must return vehicles in good shape

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Everyone must study and know Penn State policies relating to risk:

1. https://guru.psu.edu/policies/psu/BS20.html
2. http://www.controller.psu.edu/divisions/riskmanagement/docs/walletcard.pdf
   If a student becomes sick on the trip out you cannot leave them to fend for themselves. An instructor/TA must stay with the student until they are conveyed home safely (through contact with Risk Management).
3. http://studentaffairs.psu.edu/conduct/
   You should also familiarize yourself with the Office of Student Conduct: they can help you if a student is posing a problem, including helping arrange for the student to be removed from the group.
4. **http://guru.psu.edu/formpublic/8-05IncidentFormFRM3.pdf**
   Risk Management Incident Reports - If a student is physically injured during the trip (not including general illness), the college/campus must complete an Incident Form and submit it to the Risk Management Office as soon as possible.
5. (http://guru.psu.edu/policies/SY03.html)
   Assistant VP for Student Affairs at UP or Chief Student Affairs Officer at Campus to be notified of all emergencies involving students
6. Manage situation at the most informal and appropriate level possible; serious incidents will require a more centralized approach.
7. Maintain a log of events, actions taken, and follow-up documentation.
8. You can also always contact University Police and they can transfer your call to the appropriate person (for student illnesses, accidents, conduct problems, legal altercations, etc.): Penn State UP Police Services (24/7) at **+1.814.863.1111**

Keys

University building keys are the property of the University and may not be duplicated. Loss of keys must be immediately reported to Police Services (863-1111) and to your Access Coordinator in room 503 Deike. No replacement key will be issued with payment of the replacement cost ($20/key)

Keys must be returned to the Access Coordinator upon termination of employment and/or student status or transfer from the Department of Geosciences.

Failure to return keys upon termination or transfer may result in the withholding of the appropriate amount from the employee's paycheck or a charge to a student's account until the keys are returned.

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Vehicle Use

Drivers of Departmental and University vehicles must meet the following basic requirements:

1. Must have a successfully completed the Motor Vehicle background checks; please see the Administrative Assistant for paperwork
2. Must be an employee of the University
3. Must be 21 or over
4. Must have a valid US driver's license
5. Must take the maxivan online course
6. Must be present for the vehicle sign out and inspection

The Department of Geosciences currently owns a metallic tan Chevy Suburban that seats 8 - 9 persons. It is parked in the Nittany Parking Deck, usually on the 4th or 5th floor. As a vehicle with university plates, there is no charge for the Suburban use of the Nittany Parking Deck.

Vehicle Sign-Out

1. Make a request in person or via email to Jo Ann Lehtihet or Jennifer Billett (503 Deike) to reserve the vehicle. If the vehicle is available for the date and time you request, please provide the name of the driver (if not yourself), your destination and purpose for the trip, and the budget number against which vehicle mileage will be charged. This will be entered into both the on-line vehicle reservation system and the hard copy vehicle reservation sheet.

2. On the day of vehicle use (or the previous business day if you need the vehicle when the main office is closed), go to 503 Deike to pick up the vehicle key and a copy of this Document (Use of Departmental Vehicle).You will also need to check the hard copy vehicle reservation sheet to determine where the last user parked the vehicle and the ending gas level of the previous use.

3. When picking up the vehicle at the Nittany Parking Deck, please note the beginning mileage. A parking ticket from the last entry into the parking deck should be in the glove compartment. You will need this ticket to exit the parking facility.

Fuel Card

A departmental fuel card is located in the glove compartment of the vehicle (along with the vehicle's registration and insurance documents) and may be used to purchase fuel at any gas station. When using the card, you will be prompted to enter the odometer reading and a PIN before fueling. **The PIN number for the fuel card is 1001.** As a courtesy to the next user, please return the vehicle to the Nittany Deck after your use with **no less than** one-half tank of fuel.

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Cleanliness

We expect that the departmental vehicle be clean inside and out when returned to the Nittany Parking deck. This is the user's responsibility. Cleaning expenses, such as at a Car Wash, incurred by individuals may be reimbursed with submission of a receipt to Jennifer Billett.

Returning the Vehicle

Please do not keep the vehicle past your scheduled time as others may have reserved it in your absence. Return the departmental vehicle to the Nittany Parking Deck, if possible parking on either the 5th or 4th floors. Place the parking ticket you obtained upon entry in the glove compartment. Make note of the ending mileage and the fuel level. Return the keys to 503 Deike and complete the hard copy vehicle reservation sheet with the beginning and ending mileage, ending fuel level, and the location of the parked vehicle.

DEPARTMENT OF GEOSCIENCES
2001 Chevy Suburban
Color: Metallic Tan

Plate Number: A2337P (Navy Penn State Plate)

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Parking Instructions

Enter the Nittany Parking Deck on the visitor side and take a ticket. Likewise, exit the deck on the visitor side, handing the ticket to the staff manning the exit booth. Because the Suburban has a university license plate, you will not be required to pay for parking. Note that there is a parking attendant at the exit booth between 7:30 am and midnight.

Maintenance

Inspection, servicing, and periodic detailing of the Suburban are managed by Don Voigt and Denny Walizer. Drivers are asked to immediately report damage to and/or problems with the Suburban to the Geosciences Main Office (865-6711), Denny Walizer (227 Deike, dpw3@psu.edu, 863-2023), or Don Voigt (209 Deike, dev2@psu.edu, 865-3732).

Driver Requirements

Drivers of the Suburban must be at least 21 years of age with a valid driver's license issued by a state of the United States or by a province of Canada. In addition, the Suburban may only be driven by paid employees of the Penn State University. Non-employees may be passengers, but not in the capacity of driver. Fines (for violations such as parking and speeding) are the responsibility of the Suburban user.

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Appendix V: Department of Geosciences Faculty Recognition between 1969 & 2024

1969	Robert F. Schmalz	Wilson Award for Excellence in Teaching in Earth and Mineral Sciences
1970	David P. Gold	Wilson Award for Excellence in Teaching in Earth and Mineral Sciences
	Hiroshi Ohmoto	Waldemar Lindgren Award, Society of Economic Geology
	E. G. Williams	Wilson Award for Excellence in Teaching in Earth and Mineral Sciences
1971	Robert F. Schmalz	Lindback Award for Distinguished Teaching
1972	Robert E. Newnham	Wilson Award for Excellence in Teaching in Earth and Mineral Sciences
	Charles P. Thornton	Wilson Award for Excellence in Teaching in Earth and Mineral Sciences
1973	Hiroshi Ohmoto	F.W. Clarke Award, Geochemical Society
1974	Al Guber	Reinhardt Theissen Medal from the International Committee for Coal & Organic Petrology
	William B. White	Wilson Award for Excellence in Teaching in Earth and Mineral Sciences
	Roger J. Cuffey	Elected fellow of the Geological Society of America
1977	Peter Lavin	Wilson Award for Excellence in Teaching in Earth and Mineral Sciences
	Richard Parizek	Karl M. Mason Award from the Pennsylvania Department of Environmental Resources
1980	Mike Arthur	American Association of Petroleum Geologists President's Award
1981	Hiroshi Ohmoto	Penn State’s Faculty Scholar Medal Outstanding Achievement in Science and Technology
1982	Richard Parizek	Sixth Birdsall Distinguished Lecturer

1983	Robert Scholten	Wilson Award for Excellence in Teaching in Earth and Mineral Sciences
1984	Richard Parizek	The Geological Society of America Clear Water Conservancy Award
	Barry Voight	Applied Research Award from the National Research Council
1986	Richard R. Parizek	Wilson Award for Excellence in Teaching in Earth and Mineral Sciences
1988	Kevin P. Furlong	Wilson Award for Excellence in Teaching in Earth and Mineral Sciences
1989	Roger J. Cuffey	Wilson Award for Excellence in Teaching in Earth and Mineral Sciences
	Terry Engelder	Elected a Fellow of the Geological Society of America
1990	Alfred Traverse	Paleobotanical Society International Medal
	Barry Voight	Wilson Award for Excellence in Research in Earth and Mineral Sciences
1991	Richard B. Alley	David and Lucile Packard Foundation Fellowship in Science and Engineering and Presidential Young Investigator Award
	Susan L. Brantley	David and Lucile Packard Foundation Fellowship in Science and Engineering and Presidential Young Investigator Award
	Buzz Graham	Wilson Award for Excellence in Teaching in Earth and Mineral Sciences
	Richard Parizek	Gabriel Narutowicz Medal from the Institute of Meteorology and Water Management, Warsaw, Poland
	Barry Voight	Faculty Scholar Medal for Outstanding Achievement in the Physical Sciences and Engineering
1992	Eric J. Barron	Wilson Award for Excellence in Research in Earth and Mineral Sciences
	Terry Engelder	Wilson Award for Excellence in Teaching in Earth and Mineral Sciences

1993	Kevin Furlong	Wilson Award for Excellence in Research in Earth and Mineral Sciences
	James Kasting	Alumni Merit Award of the University of Michigan's Atmospheric, Ocean and Space Sciences Alumni Society
	Deane Smith	Elected Fellow of the Geological Society of America and the Mineralogical Society of America and to the Commission on Powder Diffraction of the International Union of Crystallography
1994	Alan Davis	Reinhardt Theissen Medal of the International Committee for Coal & Organic Petrology
	Peter Deines	Wilson Award for Excellence in Research in Earth and Mineral Sciences
	Hiroshi Ohmoto	Awarded the Silver Medal of the Society of Economic Geologists
1995	Hubert L. Barnes	Distinguished Visiting Fellow, University of Wales
	Albert Guber	Wilson Award for Excellence in Teaching in Earth and Mineral Sciences
	James Kasting	Fellow of the American Association for the Advancement of Science
1996	Richard B. Alley	Robert E. Horton Award of the American Geophysical Union
	Michael A. Arthur	Francis P. Sheppard Medal in Marine Geology from the Society for Sedimentary Geology
	Eric J. Barron	Fellow of the American Meteorological Society.
	Peter Flemings	Wilson Award for Excellence in Teaching in Earth and Mineral Sciences
	Rudy L. Slingerland	Wilson Award for Excellence in Research in Earth and Mineral Sciences
1997	Richard B. Alley	Wilson Award for Excellence in Teaching in Earth and Mineral Sciences
	Eric J. Barron	Distinguished Lecturer of the American Association of Petroleum Geologists
	Susan L. Brantley	Wilson Award for Excellence in Research in Earth and Mineral Sciences
	Katherine H. Freeman	Peter Schenck Award of the European Association of Organic Geochemists
1998	Hubert Barnes	University Distinguished Professor

	Roger J. Cuffey	Two fossil organisms, Cuffeyella arachnoidea and Deplotrypa cuffeyi, named after Roger J. Cuffey.
	Katherine H. Freeman	James Lee Wilson Medal from SEPM, the Society for Sedimentary Geology
	Lee Kump	Fellow of the Geological Society of America
	Richard R. Parizek	M. King Hubbert Science Award of the National Ground Water Association
1999	Eric J. Barron	Wilson Award for Excellence in Teaching in the College of Earth and Mineral Sciences
	Richard Parizek	Award for Distinguished Service in Hydrogeology from the Hydrogeology Division, The Geological Society of America
2000	Richard B. Alley	Faculty Scholar Medal for Outstanding Achievement in Physical Sciences and Engineering.
	Michael A. Arthur	Wilson Award for Excellence in Research in Earth and Mineral Sciences
	Hubert L. Barnes	Geochemistry Fellow of the Geochemical Society and the European Association of Geochemistry
	Alan Davis	Gilbert H. Cady Award from the Geological Society of America, Coal Geology Division.
2001	Kevin Furlong	G. Montgomery and Marion Mitchell Award for Innovative Teaching
	Hiroshi Ohmoto	Wilson Award for Excellence in Research in Earth and Mineral Sciences
	Richard R. Parizek	Charles V. Theis Award, American Institute of Hydrology
	Alfred Traverse	Excellence in Education medal from the American Association of Stratigraphic Palynologists.
2002	Hubert Barnes	Penrose Medal from the Society of Economic Geologists
	James Kasting	Elected to the International Society for the Study of the Origin of Life
2003	Hubert Barnes	Distinguished Service Award from the Geochemical Society

	Roger Cuffey	Richard Owen Award from the Indiana University Department of Geological Sciences
	Roger Cuffey	Inter-College Ecology Program, Long-Term Service Award
	Rudy L. Slingerland	Wilson Award for Excellence in Teaching in the College of Earth and Mineral Sciences
2004	Richard B. Alley	G. Montgomery and Marion Mitchell Award for Innovative Teaching
	Susan L. Brantley	Faculty Mentoring Award in Earth & Mineral Sciences
	Peter Deines	Wilson Award for Outstanding Service, Earth and Mineral Sciences
	Kate Freeman	Wilson Award for Excellence in Teaching in the College of Earth and Mineral Sciences
	James Kasting	Elected Fellow of the American Geophysical Union
	Richard Parizek	Michel T. Halbouty Award from the Geological Society of America
2005	Michael Arthur	Wilson Award for Outstanding Service:
	James F. Kasting	Faculty Scholar Medal Award
	Lee Kump	Faculty Mentoring Award in Earth & Mineral Sciences:
	Demian Saffer	GSA Young Investigator Award Recipient
2006	Richard Alley	Louis Agassiz Medal by the European Geosciences Union. Awarded the International Glaciological Society's Seligman Crystal
	Tanya Furman	Presidential Award for Excellence in Science, Mathematics and Engineering Mentoring
	Peter Heaney	Faculty Mentoring Award in Earth & Mineral Sciences; Elected Fellow of the Geological Society of America
	Richard Parizek	Wilson Award for Outstanding Service
	Peter Wilf	The David and Lucile Packard Foundation Fellowship
2007	Richard Alley	Roger Revelle Medal from AGU

	Michael Arthur	Laurence L. Sloss Award in Sedimentary Geology from GSA.
	Susan L. Brantley	Elected Fellow of AGU; EMS Wilson Award for Outstanding Service
	Katherine Freeman	Elected Fellow of GSA.
	Lee R. Kump	Wilson Award for Excellence in Research in Earth and Mineral Sciences
2008	Richard Alley	Elected a Member of the National Academy of Sciences
	Michael A. Arthur	Elected a Fellow of the American Association for the Advancement of Science (AAAS).
	Susan L. Brantley	University Distinguished Professorship
	Katherine H. Freeman	EMS Faculty Mentoring Award for her dedication to graduate education.
	Kevin P. Furlong	Elected fellow of the Geological Society of America.
	Peter J. Heaney	G. Montgomery and Marion Mitchell Award for Innovative Teaching.
	James Kasting	Elected a Member of the American Academy of Arts and Sciences.
	James D. Kubicki	EMS Faculty Mentoring Awards for his dedication to graduate education.
	Barry Voight	Elected a Fellow of the American Geophysical Union.
2009	Richard Alley	Tyler Prize for Environmental Achievement
	Charles Ammon	Wilson Award for Excellence in Research in the College of Earth and Mineral Sciences
	Jenn Macalady	Faculty Mentoring Award for superb graduate teaching and advising.
	Hiroshi Ohmoto	Society of Resource Geology's Kato Medal
	Kamini Singha	Environmental and Engineering Geophysical Society's Early Career Award
2010	Richard Alley	Elected a Fellow of the American Academy of Arts and Sciences.
	Kate Freeman	Named a Fellow of the John Simon Guggenheim Memorial Foundation.

	Chris Marone	Wilson Award for Excellence in Research
	Eliza Richardson	G. Montgomery and Marion Mitchell Award for Innovative Teaching
	Demian Saffer	Friedrich Wilhelm Bessel Research Award from the Alexander von Humboldt Foundation.
2011	Richard B. Alley	Stephen H. Schneider Award for Outstanding Climate Science Communication, Climate
	Sridhar Anandakrishnan	Elected Fellow of the American Geophysical Union.
	Dave Bice	G. Montgomery and Marion Hall Mitchell Award for Innovation in Teaching.
	Tim Bralower	Fulbright Scholarship
	Susan L. Brantley	Arthur L. Day Medal from the Geological Society of America.
	Kate Freeman	Elected a Fellow of the Geochemical Society.
	Peter Heaney	Wilson Award for Excellence in Teaching.
	Art Rose	William T. Plass Award from the American Society of Mining and Reclamation.
	Kamini Singha	George W. Atherton Award for Excellence in Teaching.
2012	Richard Alley	U.S. News STEM Leadership Hall of Fame Awards.
	Susan L. Brantley	Elected to the National Academy of Sciences; Presidential Award, The Soil Science Society of America; Elected Geochemical Fellow from the Geochemical Society and European Association of Geochemistry.
	Kate Freeman	Science Innovation Award in Biogeochemistry.
	Tanya Furman	Penn State Commission for Women Achieving Woman Award
	James Kasting	Named Evan Pugh Professor
	Lee Kump	Elected Geochemical Fellow from the Geochemical Society and European Association of Geochemistry.
	Jenn Macalady	Named a Kavli fellow of the National Academy of Sciences.
	Andy Nyblade	Paul G. Silver Award from the American Geophysical

	Rudy Slingerland	G. K. Gilbert Award for Geomorphology by AGU's Earth and Planetary Surface Processes Focus Group.
2013	Richard Alley	American Association for the Advancement of Science Public Engagement with Science Award.
	Richard Alley	Honorary Doctorate of Science from the University of Wisconsin.
	Susan L. Brantley	Honorary doctorate by the University of Lausanne, Switzerland.
	Elizabeth Hajek	Rudy L. Slingerland Early Career Professorship.
	Katherine H. Freeman	Elected to n the National Academy of Sciences; Elected Fellow American Geophysical Union
	Katherine H. Freeman	Wilson Award for Excellence in Research in the College of Earth and Mineral Sciences
	Hiroshi Ohmoto	Geochemical Society of Japan's Shibata Medal
	Rudy L. Slingerland	Elected Fellow of the American Geophysical Union
	Andrew A. Nyblade	Elected Fellow of the American Geophysical Union
	Peter Wilf	George W. Atherton Award for Excellence in Teaching
	Barry Voight	Thorarinsson Medal of the International Association of Volcanology and Chemistry of the Earth's Interior
2014	Richard Alley	Elected as a Foreign Member of the Royal Society (UK); Arthur L. Day Prize and Lectureship of the US National Academy of Sciences; Friend of the Planet award from the National Center for Science Education (NCSE); honorary degree (Doctor of Humane Letters Honoris Causa) from Albion College.
	Timothy Bralower	Elected Councilor to the Geological Society of America.
	Don Fisher	Paul F. Robertson Award for Research Breakthrough of the Year, College of Earth and Mineral Sciences
	Lee Kump	Elected Fellow of the American Geophysical Union,
	Chris Marone	Elected Fellow of the American Geophysical Union; Paul F. Robertson Award for Research Breakthrough of the Year, College of Earth and Mineral Sciences
	Demian Saffer	Paul F. Robertson Award for Research Breakthrough of the Year, College of Earth and Mineral Sciences

	Peter Wilf	Distinguished Member of the National Society of Collegiate Scholars
2015	Richard Alley	Honorary Doctor of Science, University of Chicago; BBVA Foundation Frontiers of Knowledge Award
	Chuck Ammon	Elected Fellow of the American Geophysical Union
	Timothy Bralower	College of Earth & Mineral Sciences' Wilson Award for Outstanding Service
	Katherine Freeman	Penn State Distinguished Professor
	James Kubicki	Wilson Award for Excellence in Research in the College of Earth and Mineral Sciences
	Mark Patzkowsky	Elected Fellow of the Paleontological Society
2016	Richard Alley	Climate Communications Prize, AGU
	Susan L. Brantley	Wollaston Medal of the Geological Society of London; Geochemistry Division Medal by the American Chemical Society
	Terry Engelder	Gordon H. Wood Memorial Award from the Energy and Mineral Division of the Eastern Section of AAPG
	Katherine Freeman	Penn State Evan Pugh Professor
	Elizabeth Hajek	College of Earth and Mineral Sciences' Wilson Award for Excellence in Teaching
	Peter Heaney	College of Earth and Mineral Sciences' Faculty Advising Award
	Chris House	Elected Fellow Geological Society of America; Member of the current NASA Mars Science Laboratory Curiosity Rover team
	James Kasting	Stanley Miller Medal of the National Academy of Sciences
	Tess Russo	Rudy L. Slingerland Early Career Professor
	Peter Wilf	Elected Fellow Geological Society of America; Paul F. Robertson Award for Research Breakthrough of the Year, College of Earth and Mineral Sciences
2017	Richard Alley	Wollaston Medal, Geological Society of London
	Hu Barnes	Penn State Alumni Association Honorary Alumnus Award

	Timothy Bralower	Mitchell Award for Innovative Teaching, College of Earth and Mineral Sciences
	Terry Engelder	Wilson Award for Excellence in Research, College of Earth and Mineral Sciences
	Donald Fisher	Wilson Award for Excellence in Teaching, College of Earth and Mineral Sciences
	Katherine Freeman	Alfred Treibs Award, Geochemical Society
	Lee Kump	Robert M. Garrels Award of the Geobiology Society
	Chris Marone	Editors' Citation for Excellence in Refereeing for *Geophysical Research Letters*
	Andrew Nyblade	Penn State's President's Award for Excellence in Academic Integration
	Byron Parizek	Penn State's University College Faculty Scholar Medal
	Barry Voight	Elected to the National Academy of Engineering
	Andrew Smye	President's Award, Geological Society of London; Rudy L. Slingerland Early Career Professorship
	Peter Wilf	Elected Fellow of the Paleontological Society
2018	Richard Alley	Honorary Member of the American Meterological Society; Distinguished Explorer of the Roy Chapman Andrews Society
	James Kasting	Elected member of the National Academy of Sciences
	Arthur Rose	Hitchon Award, International Association of Geochemistry
	Michael Arthur	V. M. Goldschmidt Award from the Geochemical Society; elected Fellow of the Geochemical Society
	Peter LaFemina	Hanse-Wissenschaftskolleg Institute for Advanced Study Fellowship
	Andy Nyblade	Wilson Award for Outstanding Service in the College of Earth and Mineral Sciences
	Tieyuan Zhu	J. Clarence Karcher Award, Society of Exploration Geophysicists
2019	Richard Alley	Roosevelt "Rosey" Thompson Award; Visiting Scholar of Phi Beta Kappa
	Maureen Feineman	Wilson Award for Excellence in Teaching, Penn State College of Earth and Mineral Sciences

	Katherine Freeman	Richard Owen Distinguished Alumni Award, Department of Earth & Atmospheric Sciences, Indiana University
	Klaus Keller	Penn State Outstanding Postdoc Mentor Award; Paul F. Roberson Award for Research Breakthrough of the Year, Penn State College of Earth and Mineral Sciences
2020	Charles Ammon	G. Montgomery and Marion Mitchell Award for Innovative Teaching
	Sridhar Anadakrishnan	Wilson Award for Excellence in Research, College of Earth and Mineral Sciences
	Timothy Bralower	George W. Atherton Award for Excellence in Teaching
	Roman DiBiase	Rudy L. Slingerland Early Career Professor of Geosciences
	Katherine Freeman	Nemmers Prize in Earth Sciences from Northwestern University
	Byron Parizek	Delta Mu Sigma Honor Society's Susanne Waitkus Faculty Award for Academic Excellence
2021	Susan L. Brantley	Recipient of the Dr. Hubert Barnes and Dr. Mary Barnes Professorship in Geosciences; Elected to American Academy of Arts and Sciences
	Maureen Feineman	Schreyer Honors College Excellence in Advising Award; College of Earth and Mineral Sciences' Faculty Advising Award
	Katherine Freeman	Arthur L. Day Medal from the Geological Society of America
	Tanya Furman	Elected president of the Education Section of the American Geophysical Union
	Elizabeth Hajek	President-elect of the Society for Sedimentary Geology
	Kimberly Lau	GSA Geobiology and Geomicrobioloogy Division Pre-Tenure Award
	Richard Parizek	International Service Award from the International Association of Hydrogeologists
	Mark Patzkowsky	College of Earth and Mineral Sciences' Faculty Mentoring Award
2022	Susan L. Brantley	IAGC Vernadsky Medal in 2022 from the International Association of Geochemistry; named an Evan Pugh University Professor by Penn State
	Katherine Freeman	Honorary Doctorate of Science from the University of Chicago

	Sarah Ivory	Wilson Faculty Fellow; recipient of Geological Society of America Continental Scientific Drilling Division Distinguished Lecturer Award
	Lee Kump	Elected a member of the U.S. National Academy of Sciences
	Kimberly Lau	Donath Young Scientist Medal, Geological Society of America
	Mark Patzkowsky	Fulbright Fellowship
	Christelle Wauthier	Elected President-elect for the Natural Hazards section of the American Geophysical Union
	Peter Wilf	College of Earth and Mineral Sciences' Wilson Award for Excellence in Research
2023	Elizabeth Hajek	Wilson Award for Outstanding Service from the College of Earth and Mineral Sciences
	Peter Heaney	George W. Atherton Award for Excellence in Teaching; Honorary Award from the Eastern Federation of Mineralogical and Lapidary Societies
	James Kasting	Named Atherton Professor
	Kimberly Lau	Sloan Foundation Research Fellowship
	Peter Wilf	Elected an AAAS Fellow
2024	Sridhar Anandakrishnan	Fulbright Fellowship
	Don Fisher	Wilson Award for Outstanding Service
	Chris House	Wilson Award for Excellence in Research
	Miquela Ingalls	Early Career Scientist Award, Society for Sedimentary Geology
	Jesse Reimink	Paul F. Robertson Award for Research Breakthrough of the Year

APPENDIX VI

SPECIAL PROGAMS – 2000-2024

AFRICAARRAY

AfricaArray was started in 2005 as an initiative to rebuild the geophysics program at the University of the Witwatersrand (Wits) in Johannesburg, South Africa. In 2004, the Head of the School of Geosciences, Prof. Paul Dirks, approached Prof. Andrew Nyblade about how to rebuild the once preeminent geophysics program at Wits, which had gone into decline during the 1990's. Together, Nyblade and Dirks formulated a plan containing five key elements: 1) Fund raising to increase the number of geophysics faculty at Wits and support a vigorous research program in solid earth geophysics; 2) Establishing a geophysical observatory network to provide data for research by faculty, graduate students and postdocs; 3) Expand the geophysics field school at Wits that was part of the B.Sc. honors degree in geophysics to include non-degree students from other universities; 4) Hold an annual science workshop; 5) Develop programs to attract students to Wits from historically disadvantaged communities (Nyblade et al., 2008). Nyblade, aware that in the U.S. there were similar issues of underrepresentation in the geosciences, decided to add a sixth element, a diversity program for U.S. students at Penn State that would link to programs at Wits and provide an international educational experience for U.S. underrepresented minority (URM) students.

After a year of successful fundraising and the Council for Geoscience (aka South African Geological Survey) pledging ten seismic stations from the South African National Seismic Network to start the geophysical observatory network, AfricaArray was launched in 2005 with an inaugural workshop at Wits. The workshop was attended by geoscientists from throughout Africa, and because of the needs expressed at that workshop for improved science capacity building in much of Africa, a decision was made to expand the geophysical observatory network beyond South Africa, and, where possible, support research and the training of African students at other African universities. AfricaArray grew quickly, with seismic

observatories established in many African countries, participation in the geophysics field school by students from outside Wits, and the development of industry collaborations. In 2007, Prof. Ray Durrheim was hired into a chaired position at Wits with support from the South African National Research Foundation, and with Ray on board, the number of AfricaArray graduate students and postdocs at Wits expanded rapidly. In 2009, Prof. Paul Dirks left Wits for a faculty position in Australia, and Prof. Durrheim took over as co-director of AfricaArray together with Prof. Nyblade. By 2010, the observatory network consisted of over 50 seismic stations in more than 15 African countries, and 2011-2012 GPS receivers and automated weather stations were added to about half the observatories (Nyblade et al., 2011).

Over the years, AfricaArray became defined by several core components. The first was an annual science workshop held at Wits University, routinely attended by 80-100 scientists, mostly from Africa, but also from other continents. The workshop served to bring the AfricaArray community together to share science results, network, provide students and postdocs with opportunities for giving research presentations, and for station operators to troubleshoot problems and fix equipment. The geophysical observatory developed into a network of stand-alone distributed stations spread throughout eastern, western and southern Africa. The observatory network provided open access data archived under the AF network code at the IRIS data management center and greatly expanded the availability of broadband seismic data for the African continent. In addition, many project-specific temporary seismic networks were deployed for one or more years in several countries. The geophysics field school, run annually over a 2-week period, provided students from all over Africa a unique opportunity to build friendships and collaborations while at the same time gain valuable training in practical geophysical data acquisition, processing and interpretation methods (Webb et al., 2015). The final, and perhaps most important core component was the training of undergraduate and graduate students at Wits, Penn State and several other African universities. Between receiving degrees (B.Sc., M.S., Ph.D.), attending the field school and

workshops, and participating in the U.S. diversity program, well over 200 students were involved in AfricaArray between 2005 and 2024.

The diversity program for U.S. URM students at Penn State was run by Prof. Nyblade with help from many postdocs and senior graduate students mentored by Prof. Nyblade. Financial support was provided by Penn State, NSF, and several oil companies. The program included an eight-week summer research and education experience at Penn State, during which the students traveled to South Africa to participate in the geophysics field school run by Wits and to attend the AfricaArray workshop. During the academic year, the students were mentored and supported by faculty at their home institutions. An annual AfricaArray forum was held early each fall semester in Houston at one of the supporting oil companies, providing students a chance to learn about careers in the oil industry, present research results from their summer projects, and network with company recruiters. From 2005-2019, over 100 students participated in the program. Most of the students came from five core partner minority-serving institutions, Fort Valley State University, North Carolina A&T University, University of Texas – El Paso, California State University Northridge, and California State University Bakersfield. The diversity program shut down in 2020 when the covid-19 pandemic hit and, unrelated to the pandemic, Penn State withdrew its financial support for the program.

AfricaArray remains a vital part of the School of Geosciences at Wits. Although the permanent observatory network was shut down during the covid-19 pandemic and has not yet been restarted, the research and education program at Wits in 2024 was going strong, with over 20 graduate students and postdocs supported. In 2022, Prof. Ray Durrheim theoretically retired, however he remained active in fund raising, running projects, teaching and supervising students. Similarly, Prof. Nyblade continued to support and mentor students at Wits. Prof. Sue Webb continued to run the geophysics field school, and two recently hired faculty, Profs. Musa Manzi and Stephanie Scheiber-Enslin, quickly developed active research programs, leading AfricaArray into the future.

The scientific impact of AfricaArray can be measured by the over 200 publications in referred journals, covering the areas of African crust and mantle structure, the tectonic evolution of the African continent, the seismotectonics and seismic hazards of sub-Saharan Africa, mine seismology, reflection seismic imaging at basin and sub-basin scale, and potential field imaging. Many of the publications stem from over 100 M.Sc. and Ph.D. theses by AfricaArray students, and also from research done by over 20 postdocs. Of those students and postdocs, 34 were supported and mentored by Prof. Nyblade at Penn State. The impact on the geoscience workforce, besides the training of graduate students and postdocs, includes over 100 U.S. URM students who participated in the diversity program between 2005 and 2019. Many of them took industry jobs upon completion of their undergraduate degrees, while some matriculated into M.S. or Ph.D. programs, either at Penn State or other universities in the U.S.

Nyblade, A., Dirks, P., Durrheim, R., Webb, S., Jones, M., Cooper, G. and Graham, G., 2008. AfricaArray: Developing a geosciences workforce for Africa's natural resource sector. *The Leading Edge*, 27(10), 1358-1361.

Nyblade, A.A., Durrheim, R., Dirks, P., Graham, G., Gibson, R. and Webb, S., 2011. Geoscience initiative develops sustainable science in Africa. *Eos, Transactions American Geophysical Union*, 92(19), 161-162.

Webb, S., Manzi, M., Scheiber-Enslin, S., Chinamora, B., Naidoo, A., Lee, S.A., Isiaka, A., Mngadi, S., Tshitlho, K., Nyblade, A. and Emry, E., 2015. AfricaArray International Geophysics Field School: diversity and training come together in Africa. *The Leading Edge*, 34(10), 1230-1235.

Durrheim, R.J., and Nyblade, A.A., Insights into the structure and geodynamics of the African continent produced by AfricaArray seismograph networks, 17th SAGA Biennial Conference, Extended Abstract, 2022.

APPALACHIAN BASIN BLACK SHALES GROUP (ABBSG)

ABBSG was an industry-funded research group organized by department Professor Terry Engelder along with colleagues Michael Arthur and Rudy Slingerland with the objective of predicting the properties and occurrences of organ-rich (black) shales in the central Appalachian Basin. Arthur's major research interest was black shale and the nature of organic source rocks, Slingerland had a long-term research

interest in the Devonian stratigraphy of the basin, and Engelder had long studied joints in gas shales and their role in gas production in horizontal wells. As noted above, the early 2000s saw an increase in the price of energy and a renewed desire by American politicians for "energy independence." Earlier research funded by the Department of Energy (DOE) such as the Eastern Gas Shales Project (EGSP) focused on the question of whether shale source rocks in the Appalachian, Illinois, and Michigan basins—largely Devonian in age—could be treated as reservoir rocks. By 2007 advances in drilling technology and the fruits of the EGSP had paid off with the successful exploitation of gas shale in Texas, Oklahoma, and Arkansas. By 2007 a black shale hydrocarbon play was rapidly developing in Pennsylvania, spurred by Engelder and his SUNY Fredonia colleague, Gary Lash, who had made a concerted effort to understand the economic potential of the Marcellus Formation, the most obvious gas shale in the basin. In the August 2009 issue, the Fort Worth Basin Oil and Gas Magazine published Engelder's first attempt at a statistical calculation which suggested that there was a 50% probability that the Marcellus alone would produce 489 Tcf during the lifetime of the field. 489 Tcf of gas is 81.5 billion barrels of oil equivalent, or more than *four* times the total reserves of oil in the US at that time. The goal of ABBSG was to develop a deeper understanding of black shale formation and structural behavior while providing valuable information to companies and the public unfamiliar with Appalachian stratigraphy. Eventually more than a dozen companies with working interests in the Marcellus and other black shales contributed funding to AABSG primarily for data collection and student support. An anti-fracking lobby questioned this use of industry monies for research[1], even as those monies allowed ABBSG to establish a core laboratory with a multi-instrument core scanner and over 5,000 feet of Middle Devonian black and gray shale core from the Marcellus, Mahantango, and Geneseo/Burket Fms. Over its decade of existence ABBSG fully supported 11 graduate students & numerous undergraduate research projects and published

[1] https://www.publicsource.org/public-colleges-private-money-how-research-about-marcellus-shale-is-funded/

11 theses and dissertations and 21 articles in refereed journals on Devonian stratigraphy, geochemistry of the Marcellus Fm., and the relationship between burial history and joint development.