DEPARTMENT OF GEOGRAPHY AND GEOLOGY
ACADEMIC PROGRAM REVIEW
COMPREHENSIVE REPORT: 1998-2003

PROGRAM NAME: BS in Geography
and AS in Meteorological Technology
and GIS Certificate Program

WKU REFERENCE NUMBER: 674 (BS), 674P (BS Prep)
269 (AS) and 174 (GIS)

DEPARTMENT NAME: Geography and Geology

NAME OF DEPARTMENT HEAD: David J. Keeling

NAMES OF FULL-TIME FACULTY WHO REGULARLY TEACH COURSES IN THIS PROGRAM:
Algeo, Katie Crawford, Nicholas Keeling, David
All, John Deal, Richard Kenworthy, Stephen
Bingham, James Dobler, Scott Kreitzer, Debbie
Blackburn, Will Foster, Stuart Mahmood, Rezaul
Cary, Kevin Groves, Chris Trapasso, Michael

** Crawford, Dobler, and Groves also teach courses in the Geology program occasionally.

NAMES OF OPTIONAL RETIREES WHO REGULARLY TEACH COURSES IN THIS PROGRAM:
Petersen, Albert

NAMES OF PERSONS PRIMARILY RESPONSIBLE FOR PREPARING THIS REPORT:
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DATE OF SUBMISSION: December 1, 2003
ACADEMIC PROGRAM REVIEW
Department of Geography and Geology
December 1, 2003

OVERVIEW OF THE DEPARTMENT
The Department of Geography and Geology comprises 20 full-time faculty and serves about 210 undergraduate majors, 40 minors, and 28 graduate students in a variety of specializations. The Department offers a B.S in Geography, a B.S. in Geology, and an MS in Geoscience (with separate reports provided on each program), as well as an AS in Meteorological Technology and a 12-hour GIS Certificate. Several educational, research, and public service facilities are housed within the Department that provide exciting opportunities for a combination of theoretical and practical work. A major goal of the Department is to involve undergraduate and graduate students actively in all aspects of research as an integrated part of their academic programs with the purpose of nurturing their intellectual growth, critical-thinking skills, and technical experience. The Center for Cave and Karst Studies serves as a major research center dealing with all aspects of cave and karst studies, with an emphasis on solving environmental problems associated with karst terrain. The Hoffman Environmental Research Institute, part of the Center for Water Resource Studies, another of the University's Applied Research centers, is a consortium of scientists and students dedicated to research and higher education at the cutting edge of environmental science. Its primary mission is to be a leader in the development of innovative, basic, and applied research programs aimed at understanding the dynamics of human-landscape-atmosphere interactions. The College Heights Weather Station maintains a fully equipped weather station with remote radar capability. The Kentucky Climate Center, directorship of the State Climatologist for Kentucky, is the certified state climate office for Kentucky and a member of the National Climate Services Partnership. The Center archives climatic data for Kentucky, provides access to state, national, and global climatic data, and is active in a wide variety of service, research, and educational outreach activities. The Department’s new Geographic Information Science (GIS) Laboratory provides a state-of-the-art educational and research facility. The Lab maintains licenses for ArcGIS, ERDAS Imagine, and S-Plus software and provides access to a variety of spatial data, including digital geologic quads, digital elevation models, digital raster graphics, digital orthophotos, and other commonly used map data. Applied and basic field research by faculty and students is conducted continually in the local area, surrounding states, and throughout the world.

II.A. Mission Statement/Relation of the Program to the University Mission
The Department of Geography and Geology at Western Kentucky University offers the B.S. Degree in Geography, as well as the AS in Meteorological Technology and the 12-hour GIS Certificate (Geographical Information Science). These programs share the common goal of preparing undergraduate students for careers in the geosciences and for further education at the graduate or professional level. The Department offers an academically rigorous and flexible program of study that prepares students for success in a global society by providing training in the following areas: critical thinking and reasoning; geographical analysis; global environmental change; the
physical and cultural contexts of social development, growth, and change; planning; and policy development (see Figure 1).

MISSION STATEMENT

The Department aims to provide students with an outstanding and practical educational experience and it strives to achieve three fundamental goals: Excellence in Teaching, Excellence in Research, and Excellence in Service. The Department is committed to providing current knowledge and leadership development in the geographical sciences to enhance the career success of students, and to engage in scholarly activities that develop new information in the geographical sciences while providing services to constituents.

Figure 1. Discipline-Centered Graphic of the Department Mission
The Department’s fundamental philosophical goal is to instill in each of its graduates the following qualities:

### STUDENT ENHANCEMENT GOALS

- Openness to others and the ability to communicate with clarity and precision;
- Self-confidence and intellectual curiosity, with the geographical and analytical skills required to satisfy both;
- A sense of scale and context in the worlds of nature and society;
- An appreciation for the richness and variety of human experience and expression;
- An intellectual mastery in and passion for the geosciences;
- A commitment to ethical and responsible citizenship, including respect for, and an ability to get along with, others;
- A sense of direction, with the self-discipline, personal values, and moral conviction to pursue life-long learning goals.

### Vision and Mission of Western Kentucky University

- Western aspires to be the best comprehensive public institution in Kentucky and among the best in the nation.

- Western aspires to be the university of choice for students and faculty who are dedicated to academic excellence.

- True to the Western spirit, the University offers an inviting, nurturing, and challenging environment, which is responsive to the intellectual, social, and cultural needs of a diverse learning community. Western’s success is reflected in the success of its alumni, who are known for their leadership, adaptability, enterprise, and commitment to Western.

- Western aspires to produce nationally and globally competitive graduates and to provide optimum service and life-long learning opportunities for its constituents.

- Western aims to prepare students for success in a global society.

These qualities are achieved in the undergraduate program through a solid grounding in geographical analysis, critical thinking and reasoning, written and oral communication, student-centered research, and quantitative interpretation. However, the program also offers sufficient flexibility in course offerings and program tracks to allow students to develop emphases in GIS, planning, education, meteorology, environment, and sustainable development. The Department also contributes to the General Education mission of the university by offering courses in Category C (Social Science), Category D (Science), and Category E (World Cultures). Indeed, the Department’s programs are critical to the institution’s mission of preparing students for success in a global society,
as success is predicated on a clear understanding of our global society, its mechanisms, structures, challenges, and opportunities. Programs and courses in the Department also clearly mesh with the vision and mission of Western Kentucky University.

Students in the B.S. in Geography must complete 44 hours in general education courses, of which 9 hours can be applied to the major or minor. Every student majoring in Geography must complete an 18-hour common core, and then may choose 15 additional hours based on the chosen program track (see Appendix G for details). The common core in Geography includes 9 lower-division hours of general education/preparatory courses (Introduction to Human Geography (Cat. C), Introduction to Physical Geography (Cat. D), and World Regional Geography (Cat. E)) and 9 upper-division hours of skill-centered courses. The skill courses are Geographic Research Methods (focus on critical thinking, writing, and communication skills), Cartographic Design for GIS (focus on maps, GIS-centered spatial analysis, and reading the landscape), and Data Analysis and Interpretation (focus on quantitative skills in data management). The major in Geography is supported by a major or minor in another discipline, for a total of at least 48 unduplicated hours in a major-minor or double major combination. Students completing the Associate Degree in Meteorological Technology complete 23 hours in the sciences (13 hours in Meteorology/Climatology, 3 hours in Math, 3 hours in Computer Science, and 4 hours in Physics), in addition to 41 hours in general education courses, for a total of 64 hours. The Geographic Information Systems (GIS) Certificate requires 12 hours of GIS courses and can be completed as a stand-alone program or as part of a major or minor in Geography.

In summary, the Department’s mission is to recruit the best students possible, to continue to provide an up-to-date and relevant program, and to review the program and its graduates regularly through ongoing assessment, appropriate capstone courses, internships, examinations, and surveys. The program is continually enhanced through the assessment process by “closing the loop” between student-centered outcomes and program purpose and quality. With its broad spectrum of geographically centered analysis, interpretation, practice, and communication, the Geography undergraduate program subscribes to the University’s aspiration to be the best comprehensive public institution in Kentucky and among the best in the nation. The Department reflects Western’s emphasis on rigorous academic standards, creative and diverse scholarship, and appropriate and relevant service to the community, region, and profession. Geography program graduates have a strong impact on the Commonwealth and nation in the fields of GIS, planning, location analysis, environmental management and consulting, business, social and economic development, teaching, and other professions requiring strong skills in spatial analysis, critical thinking, communication, and science-based reasoning. The Geography program prepares students for success in a global society.

B. Comments/Clarifications related to Institutional Research Data

Data provided by the Office of Institutional Research significantly under-report the actual number of majors in the Geography program. The Department regularly counts +/- 40 majors over the number recorded by OIR. Overall, the number of majors has remained steady over the past five years, with 178 majors recorded by the
Department at the beginning of the Fall 2003 semester (see Appendix E.1, Table E.1.1). Compared to geography program majors at other Kentucky institutions (see Appendix E.1, Table E.1.2), the Geography major is very healthy at Western, recording more than twice as many majors as the University of Kentucky and more than all the other majors combined at the University of Louisville and the other state comprehensive institutions.

Student credit hours have undergone significant fluctuation over the past five years for several reasons (see Appendix E.1, Table E.1.3, and Appendix F, Section 1.A.4). First, significant program and course restructuring has occurred since 1998 as a consequence of several retirements and the hiring of younger faculty with new types of teaching and research expertise. Second, course additions in GIS and in several advanced areas of study, including a reinvigoration of the MS program in Geoscience, have caused a downward trend in the average class size, as many of the lab-centered courses are now limited to 20 students each (see Appendix F, Section 1.A.5). Third, the Department has routinely had student/faculty ratios in the 22-27 range and has made a concerted effort to reduce this to a ratio more approximating the average for Ogden College (17:1) (see Appendix F, Section 1.A.8), the desired ratio for Western, and for other geography programs nationwide. Indeed, for most of the 1990s, the Department routinely proved to be one of the most efficient in terms of actual expenditures per SCHP, at $82 per student credit hour (see Appendix F, Section 1.C.2). The Department also has aimed to reduce the average student credit hours produced per full-time equivalent faculty (SCHP/FTEF) from an average of 425-450 to an average of 275-300, again more approximating the average for Ogden College and for many departments across the university and nationwide (see Appendix E.1, Table E.1.2). These changes are necessary to continue improving the quality of undergraduate instruction and to prepare students more effectively for success in a global society. Although instructional efficiencies can be achieved through offering larger sections of some introductory classes, many of the hands-on, skilled-based, laboratory centered, or technique-driven courses offered by the Department at both the lower- and upper-division levels require class sizes of 20 or less. Project-centered course work or courses that require demanding pedagogies cannot be delivered effectively or productively to large groups of students.

Other data, such as average ACT scores and high school GPA (see Appendix F, Section 1.B.1), show consistency over the review period, although the average GPA of students declaring geography as a major increased from 3.0 in 1998 to 3.2 in 2002. OIR data on the number of program graduates are consistent with departmental data, and show the average number of graduates per year at 32 (see Appendix F, Section 1.A.2), which is approximately one-third of all Geography degrees awarded in Kentucky and typically twice as many as graduated each year from the University of Kentucky (see Appendix I). The number of full-time equivalent faculty (FTEF) teaching geography courses grew from a nadir of 13.5 in 2001 to the current 17 positions in Fall 2003. One of these positions is dedicated, effective Fall 2003, to servicing the Glasgow campus, with 13 FTEF at the main campus (plus a ½ time faculty assignment for Department Head duties and a ½ time faculty assignment for directing the GIS Facility) and one optional retiree and several adjuncts comprising the other two FTEF positions.
C. Teaching and Learning

The teaching and learning mission of the Department is to provide a relevant, up-to-date, and integrative educational experience in Geography for its majors and minors. The Department strives to prepare students for engagement with local, national, and global issues; to instill in students ethical and moral values related to citizenship and community; and to help students develop a set of integrated theoretical and practical skills that can be applied to solving community issues and problems. The Department aims to integrate the curriculum with marketplace needs and to prepare students for careers in the public and private sectors or for advanced graduate study.

1. Program Faculty:

   Fifteen full-time faculty in the Department of Geography and Geology teach courses in the Geography program, with three of those faculty also teaching occasional courses in the Geology program. One instructor is dedicated to the Glasgow campus full-time.

   - Rank of full-time geography faculty: 4 tenured professors, 1 tenured associate professor, 1 tenured assistant professor, 5 tenure-track assistant professors, and 4 instructors.
   - The four instructors and one tenured assistant professor hold M.S. or M.A. Degrees in Geography, and the 10 tenured or tenure-track faculty hold Ph.D. degrees in geography. One faculty member also holds the J.D. degree.
   - Faculty in the Geography program participate, or have participated in, the Latin American Studies Program, the Women’s Studies Program, the Honor’s Program, the Freshman Seminar experience, and various Gifted Studies programs. Three faculty also teach courses in the Geology program, and all Ph.D. faculty teach courses in the MS Geoscience program.
   - The Department currently employs one half-time optional retiree.
   - The Department employs several adjunct faculty each semester at the extended campus locations of Owensboro, Glasgow, and Elizabethtown/Ft. Knox. Typically, their contributions equal 1.0 to 1.5 FTEF each semester.

2. Program Students:

   Driven by the CPE mandate of “more students going to college,” enrollment has not been limited in the Department. The overall educational quality of students varies tremendously, with some students ranked in the top 10 percent of their high school class and others ranked in the lower 50 percent. OIR data, such as average ACT scores and high school GPA (see Appendix F, Section 1.B.1), show consistency over the review period, although the average GPA of students declaring geography as a major increased from 3.0 in 1998 to 3.2 in 2002. There is no geography requirement in the Kentucky high-school curriculum, so most students come to the introductory, general education classes completely unprepared for geographical study and generally ignorant about the world around them. The issue of geographical illiteracy among Americans has received national and international attention and much remedial work has to be done at the entry level for most incoming freshmen (see an article addressing this issue online at: http://www.wku.edu/echo/archive/2003feb/stories/geography.htm). Nonetheless,
despite these challenges, many students successfully complete the program and go on to professional or graduate school or become productive members of the community. In terms of recruiting majors, very few high-school graduates arrive at Western pre-declared in Geography. Only the Meteorology-Climatology track in Geography attracts students directly from high school, with many of them interested in careers in broadcasting or desirous of getting involved somehow in the “exciting” area of storm chasing. Approximately 80 percent of all Geography majors and minors are recruited from the introductory, general education courses, primarily Geog 110 (World Regional) and Geog 100 (Physical Geography). Many of these students “discover” Geography well into their sophomore or junior year, and this often causes an extension of their college careers as they rush to catch up on required and sequenced courses.

3. Indicators of Teaching and Advising Quality:
   From a philosophical perspective, the Department has articulated a set of program goals and outcomes related to teaching, advising, and learning.

   **TEACHING GOALS AND OUTCOMES**

   **PROGRAM GOALS:**
   - To develop students' fundamental communication skills;
   - To develop students' critical-thinking and problem-solving abilities;
   - To instill in students core values and ethics for life;
   - To instill in students an awareness of their social and civic responsibilities;
   - To enable students to understand and engage with the concepts and practices of global interdependence;
   - To promote in students a desire for continual personal development;
   - To encourage students to enhance their aesthetic perception and ability;
   - To develop students' professional proficiency.

   **PROGRAM OUTCOMES:**
   - Students have developed the knowledge, skills, and attitudes that lead toward life-long learning and enhanced life opportunities;
   - Students understand and appreciate the diverse nature of people who live together in a world of diminishing distance;
   - Students can apply the technological knowledge, skills, attitudes, and flexibility needed to succeed in a rapidly changing environment;
   - Students have developed the cognitive processes and dispositions necessary to think critically, to analyze problems in context, and to make sound and intelligent decisions;
   - Students have acquired and utilize the body of knowledge, and have developed the constellation of skills, associated with their discipline, interdisciplinary areas of specialty, or professional field;
   - Students can gather and utilize information to enhance knowledge, and can use communication skills to convey meaning effectively and accurately;
   - Students have developed fundamental skills in the geosciences, use geoscience in their chosen fields, and understand how the geosciences can be used in analysis and problem solving.
Teaching Quality:
Since 1998, four faculty have been nominated for College awards in teaching (Dr. Siewers in the Geology program won the Ogden Teaching Award in 2002). Four faculty were awarded sabbatical leaves to facilitate more in-depth research in their disciplines. Over the past five years, 15 of the Department’s students have gone on to advanced degree programs around the country (in addition to program graduates continuing on in the Department’s Geoscience Master’s program), a tribute to the educational preparation they receive in the Department. Most faculty in the Department have incorporated digital technology and web-assisted learning into the curriculum, with several faculty using personal web pages to support their teaching. Faculty have developed new courses in Introductory GIS, Advanced GIS, Global Environmental Change, Environmental Ethics in Geography, Physical Climatology, Dynamic Meteorology, and Food and Agriculture, and have taught one-time experimental courses in World Music, Globalization, Geohazards, and Storm Water Management. Faculty have also developed a series of one-hour introductory courses targeted at non-science students to attract them to the geosciences. These courses include Volcanoes and Earthquakes, Tornadoes, Mid-latitude Cyclones, Hurricanes, Floods, Droughts, and Natural Disasters. A special section of University Experience (GEOG 175) is offered each Fall semester for students pre-declared in, or considering, Geography.

One faculty member team-teaches an interdisciplinary course in Latin American Studies with the History, Modern Languages, and Political Science departments, and three faculty teach Honor’s Program-designated courses, with at least one Honor’s section offered each semester. The Department also contributes courses to the Leadership Studies Certificate Program and a faculty member in the Department supervises student projects in the LEAD 400 and LEAD 600 capstone courses. All faculty are willing to offer enhanced Honor’s designation to any upper-division course upon request. The Department of Geography and Geology is committed to ongoing faculty development in the area of teaching. Faculty members have attended 15 workshops or activities sponsored by the Center for Teaching and Learning, and the Department’s University Distinguished Professor has agreed to a half-time appointment with the CTL commencing during the 2003-2004 academic year to promote teaching quality.

The Department strongly believes that a firm link exists between excellence in teaching and excellence in research. Faculty who consistently rank high on University S.I.T.E. evaluations for student engagement and excellence in teaching are typically productive researchers. Appendix A.1 details the scholarship produced by the Geography faculty since 1998. Much of this scholarship is either a result of student-centered collaborative research or finds its way into the classroom as case studies, exemplars, or component parts of the course curriculum.

Retention:
Over the past five years, the Geography program has averaged 30 graduates per year, with a calculated 5-year retention rate of approximately 76.5%, well above the University six-year graduation rate of 42 percent. Data show that over 80% of all students pre-declaring in Geography complete an official degree program and go on to finish the program. The Department has one or two “Peer Tutors” employed each semester, typically juniors or seniors who have earned “A” grades in each of the introductory-level courses, to assist “at-risk” students. The Department relies on the
University’s 6-week assessment process, as well as individual faculty reports, to identify poorly performing students in the introductory courses and to encourage them to seek assistance from the Peer Tutors. Internal investigations have determined that over 90% of pre-declared majors in Geography who fail an introductory course do so because of poor study habits (defined as chronic absenteeism, poor note-taking strategies, intellectual laziness, and an inability to read and interpret textual material). The same problems affect non-geography majors taking general education, introductory-level courses, with approximately 6-9 percent of enrolled students each semester taking a “W” by the official drop date. Almost all of these students have problems with excessive absenteeism and a lack of serious engagement with the course material; only a few withdraw for financial or other personal reasons.

Advising Quality:
The Department has a student-centered, faculty responsive system for student advisement. Every faculty member is expected to be a good advisor, as the Geography program has seven tracks that require discipline-centered expertise in terms of advising. All students meet with the Department Head for advising when completing the official degree program, and, typically, all pre-declared freshmen students meet with the Department Head or a faculty member who specializes in the chosen area prior to registering for courses. In 2002-2003, Debbie Kreitzer received a Master of the Spirit award for participation in the Freshman Seminar program and for focusing on advising, retention, and preparing freshmen for the university experience. She also participated in the M.A.S.T.E.R. Plan (August 2003), another program designed to help retain students by easing the transition from high school to college.

In addition to personal contact with a faculty member, students have access to specific departmental “major sheets” (see Appendix H, Tracks in the Geography Major) and to detailed program and course information posted on the Department’s website (www.wku.edu/geoweb/info/program.htm). Every major or minor track, along with descriptions of every course offered in the Department, is described on the website, and the Department has a four-year degree plan posted on the website to help students plan their progress through to graduation. Informational pages are available online for many courses, as are the syllabi. These offer an option for interested students to learn more about both content and approach for these courses. The Department strives to offer all sequenced courses on a regular basis so that students can graduate on schedule.

4. Indicators of Student Learning:

Currently-enrolled students:
Many of the program’s students choose an internship experience during their junior or senior year, and many have participated in local, national, and international supervised research projects. Forty-four students have completed external internships or an internal practicum since Summer 1999 (see Appendix K). Thirty-five of the program’s students have participated in a study abroad or departmental field camp over the past five years (including geography, geology, and geoscience students). The Department assesses each graduating senior through a written exam that comprises a basic discipline-centered knowledge survey and six written analytical and critical-thinking essays based on the student’s track in the program. Data and student feedback
from the senior assessment are used to enhance student learning through program and course revisions, thus “closing the loop” between student learning outcomes and program goals.

Students also engage in supervised course-centered and independent research, presenting posters and papers at local, regional, national, and international conferences. During the review period, over 100 student-authored papers and posters were presented at conferences and other academic meetings. Another forty-five students enrolled in directed study, independent research, or other supervised learning experiences in the Department.

Program Graduates

The majority of the graduates in Geography find employment in one of the many specialty areas of the discipline. A major barrier to successful career placement for many graduates is an unwillingness to seek employment beyond Kentucky. Moreover, a lack of career opportunities in location analysis, transportation planning, environmental management and consulting, city and regional planning, climate-related positions, and business enterprise within the state continue to limit the ability of graduates to find suitable employment beyond graduation. The Department is attempting to address this problem through program restructuring, a new focus on GIS-related courses, and more structured research-centered experiences that might better prepare students for career opportunities. Those students who have gone on for graduate study in major geography programs around the country (e.g., Indiana State, Washington, Kentucky, Tennessee, Vanderbilt, Florida, and Kansas) have been successful. Five program graduates have successfully completed the Ph.D. since 1998. According to data gathered through alumni surveys via the departmental GEOGRAM, over two-thirds of the respondents reported that they had found full-time employment in areas strongly or moderately related to their major focus within two years of graduation (see partial alumni data in Appendix G).

D. Research/Creative Activity

Faculty in the Department conduct applied and basic research in local, regional, national, and international environments on a wide variety of issues related to human-environment interactions. The Department aims to involve all of its students in applied research activities, facilitated through the activities of the Programs of Distinction and the research institutes, with particular emphasis on local and regional development issues. Appendix A.1 details the scholarship of faculty assigned primarily to the Geography program. During the review period 33 articles, books, and book chapters were published in peer-review outlets, with another 168 articles, technical reports, book reviews, editorials, and comments published in other non-peer-reviewed forums. Appendix B.1 details the academic presentations made by the faculty during the review period at conferences, university seminars, and other meetings locally, nationally, and around the world. For example, faculty in the Department have presented 279 research papers and seminars in the United States, China, Britain, Spain, Mexico, Argentina, South Korea, New Zealand, Hong Kong, Belgium, and Greece, a remarkable global reach of scholarship! Dr. Chris Groves won the 2000 Ogden College Award for Research and Scholarly Activity.
E. Service

The Department strives to provide relevant, practical service to the university, the community, the Commonwealth of Kentucky, and to the disciplines of Geography and Geology. Both faculty and students are encouraged to serve on committees, to be active in their communities, to provide expertise and advice to a variety of constituents, and to work towards improving the human-environment condition. During the review period, literally hundreds of different types of service activities were recorded by the Geography faculty, and Appendix D.1 details the myriad institutional, community, P-12, and discipline-related service activities engaged in by faculty during the review period. The quality and volume of service provided to the Department, college, institution, community, region, state, and nation distinguish this Department from many others on campus. Dr. Stuart Foster has served as the Kentucky State Climatologist since August 2000, replacing D. Glen Conner, who served in that position from 1978 with distinction until his retirement in 2000. Dr. Ken Kuehn (detailed in the Geology program section) received the Ogden College Award for Public Service in 1999 (and was also named University Distinguished Professor in 2001), and Dr. Nick Crawford received the same award in 1996. Both Drs Crawford and Kuehn have been recognized by the American Institute of Professional Geologists and the Kentucky Society of Professional Geologists respectively for distinguished service. Faculty have served with distinction in many professional organizations, including service as manuscript reviewers, officers, webmasters, grant proposal reviewers, paper-session coordinators at professional meetings, and spokespersons.

F. Grant Activity

Since 1998, faculty have been actively seeking grants and contracts from a variety of external and internal sources to support student-centered research. The Department has three research centers that function as part of Ogden College’s Applied Research and Technology Program: The Center for Cave and Karst Studies, the Kentucky Climate Center, and the Hoffman Environmental Research Institute. Over the five-year period, faculty applied for over $18 million in 204 individual grants and contracts and received total funding in the amount of $3.53 million (approximately a 20 percent success rate). Of this amount, $108,843 came from internal sources and $3.25 million came from external sources (see Appendix E.1, Table E.1.4, for summary details, and Appendix C.1 for grants detailed by faculty member).

G. Other Indicators of Program Achievement and Contributions

1. Program Viability:

The Geography program remains a strong and popular major at Western, with the average numbers of majors hovering between 160 and 175 over the past five years. The majority of majors in Geography are recruited directly from the introductory, general education courses. The strength of the program is based on student-centered learning, good advising, excellent teaching, and faculty/student research that is integrated into the curriculum. Although geography enrollments have suffered nationally over the past generation of students as a consequence of P-12 systems failing to appreciate the importance of a geographically centered education, several changes have occurred that are reinvigorating the discipline and drawing more students to the major. First, a new
Advanced Placement test in Human Geography has been introduced into high schools. Second, the development of advanced spatial mapping techniques, encapsulated in Geographic Information Science (GIS), and new satellite-based locational tools, such as Global Positioning Systems (GPS), have captured the imagination of the latest generation of students. This interest in advanced spatial mapping tools and techniques will translate into a growing demand for spatially centered courses and programs over the coming years. Tables E.1.6 and E.1.7 in Appendix E.1 detail the anticipated growth in demand for GIS-related courses and the 12-hour GIS certificate program.

2. Contributions to University Programs:

In addition to providing discipline-centered technical, theoretical, and applied courses in Geography, the Department offers several courses in General Education:

Category C - Social Science
- Geog 101 Principles of Human Geography
- Geog 350 Economic Geography
- Geog 360 Geography of North America
- Geog 471 Natural Resource Management
- Geog 480 Urban Geography

Category D – Science
- Geog 100 Introduction to Physical Geography (Honors Designated)
- Geog 121 Meteorology (Lab Designated)
- Geog 280 Introduction to Environmental Science

Category E – World Cultures
- Geog 110 World Regional Geography (Honors Designated)
- Geog 200 Introduction to Latin American Studies

The Department also contributes to the Honors Program by offering Honors designated sections of Geog 100 and 110, and offers upper-division Honors-augmented classes at the request of Honors students. Courses in the Department also fulfill requirements in the Latin American Studies program (#408), the Asian Studies program (#317), the Russian and East European Studies program (#451), the Canadian Studies program (#198), and the Middle East Studies Certificate program. Nine hours in Geography are required for the Major in Social Studies (#592), and geography courses are also accepted as concentration requirements or electives, or suggested electives, in Political Science (#686), Broadcasting (#726), News/Editorial Journalism (#716), Photojournalism (#750), Public Relations (#763), Elementary Education (#527), Middle Grades Education (#579), Industrial Sciences (#571), and Biology (#525). Several courses in the Geography program are cross-listed with the Geology program, and the Department teaches one section each Fall of University Experience for Geography and Geology majors (Geog 175). Geography faculty also collaborate with faculty in the Departments of Agriculture, Biology, Chemistry, Physics and Astronomy, Education, and Public Health in graduate and undergraduate research projects.

The Department of Geography and Geology contributes to University programs by offering study abroad and geography field-camp opportunities. Study abroad programs
help prepare students to participate in a global society. In July 2002, twenty students from five university departments enrolled in courses offered by two Geography faculty through the Department’s summer program in Australia. This study abroad experience exposed students to global issues like World Heritage Site management, the effects of tourism on sensitive environments, deforestation, air and water pollution and planning issues in a way that is impossible to duplicate in the classroom. In summer 2003, eight students and two faculty toured the southwestern United States as part of a geography field camp. Students actively engaged in experiencing different cultures and physical landscapes, which broadened their understanding of national and regional peoples and lands. In 2004, the Department is offering study abroad courses in the Bahamas (Spring Break Geology program) and in the British Isles (field-based geoscience program). Approximately 40 students have expressed interest so far in these programs. Although geography and geology students constitute the majority of the students that participate in these programs, they are open to all students at WKU. Each summer, the Center for Cave and Karst Studies offers a series of workshops based at Mammoth Cave National Park. Now in its 26th year, this program offers both university credit and continuing education credit courses. These opportunities play a significant role in Western Kentucky University’s Quality Enhancement Plan as they enhance student “engagement” and prepare students to live and work in a global society.

3. Use of Technology:

Technology has been thoroughly incorporated into the teaching, research, and service strategies of the Department during the review period. The Department has made a concerted commitment to the use of digital instruction technology to enhance student learning. Digital projectors and computers are available for instructional use in all classrooms, either permanently installed or on a mobile cart. Faculty routinely use presentation technology in conjunction with PowerPoint, interactive web sites, and various specialized software. Digital media's power lies in its ability to combine photographs, maps, and text, allowing instructors to illustrate abstract concepts with real world examples and to meet the needs of visual as well as aural learners. Through institutional Action Agenda funds, the Department developed, in partnership with the Agriculture and Architectural and Manufacturing Sciences departments, a state-of-the-art GIS facility. GIS courses are taught in the facility, which seats twenty students. All computers are networked to the internet and to the campus network. Specialized hardware in the lab includes a flat bed scanner and nine digitizing tablets. A system-wide license with ESRI Corporation provides an unlimited number of licenses for ArcGIS 8.3, an advantageous arrangement vis-à-vis future expansion of GIS facilities. Additional software includes ERDAS Imagine, CorelDraw, Visual Basic, Java, C++, S-Plus, SPSS, Dreamweaver, Fireworks, AutoDesk Map, and Mathematica. In addition to regular use for GIS instruction, the lab is scheduled on an as-needed basis by other geography and geology classes for demonstrations and hands-on analysis. The GIS Research and Development lab, containing four workstation-class computers, two file servers, a large format scanner, large format printer, and two Trimble Pro GPS units, provides advanced GIS computing facilities for student and faculty research. The lab also meets, on a contractual basis, local business and community needs for GIS services.
Through judicious use of grant funds, specialized equipment has been purchased to support student-centered research activities, including computers and other electronic equipment, scanning electron microscopes, micro-gravity meters, and other supporting materials. The Department has expended funds from its own operating budget to provide zip disks, memory-chip upgrades, faster computer processors, and other ancillary computer hardware needed to support faculty teaching and research activities. The standard computer set-up provided by the institution is completely inadequate for basic teaching and research needs in the sciences. Several of the more senior faculty are still running computers with outdated operating software, inadequate RAM and hard-drive capabilities, and without the ability to run more sophisticated analytical software (ArcGIS, S-Plus, etc.). The Department maintains a strong web presence with its departmental website (www.wku.edu/geoweb/) (see Appendix L, copy of the home page), which hosts several thousand visitors each year. The website has hundreds of information pages, with course descriptions, program summaries, and details about faculty and student research projects, as well as links to all of the important teaching, research, and service activities within the Department. The website is maintained by the Department Head and is updated monthly, or more frequently as news or changes occur.

4. Uniqueness of Department and Program:

- The Department of Geography and Geology is the only one of its kind in the Commonwealth of Kentucky and it holds the largest concentration of earth scientists in the state.
- The Department is strategically located near Mammoth Cave National Park, along the 31W Heritage Corridor, and near important coal resources. Its location offers significant research advantages.
- The Department has the only program in the United States with a specific emphasis on karst hydrogeology and on the numerous problems associated with development upon karst terrain.
- This is the only department in the Commonwealth with a curriculum in atmospheric science, and it is the only department on campus with three Programs of Distinction (The Kentucky Climate Center, the Center for Cave and Karst Studies, and the Hoffman Environmental Research Institute through the Center for Water Resource Studies).
- The Kentucky Climate Center, housed in the Department, is nationally recognized by the American Association of State Climatologists and acknowledged by the National Climatic Data Center as the State Climate Office for Kentucky.
- Faculty are diverse in training and research interests, yet provide an integrative approach to human-earth issues that spans the human and physical sciences. Several faculty are internationally respected as experts in their research areas.
- The Department's unique focus on the spatial dynamics of human-earth relationships provides an analytical perspective not offered by any other discipline on campus.
- The Department's history of successful programs in city and regional planning, environmental management, and geologic sciences places it in a unique position to integrate business, community, academic, and governmental approaches to addressing human-earth issues.
The Department's expertise in spatial and geologic analysis gives it a distinct advantage in teaching, developing, and promoting GIS (Geographical Information Science) approaches to problem solving.

The Department is distinctive in providing professional public service through the State Climatologist and the Kentucky Climate Center, through its weather information broadcasts from the College Heights Weather Station, and through the Center for Cave and Karst Studies that addresses karst-related environmental problems.

The Department is internationally recognized for its well-marketed and high-quality summer research programs at Mammoth Cave National Park that address environmental problems associated with development on the karst terrain.

The Department is distinctive in the University for its long history of successful professional public service related to human-environment issues in the local community, the Commonwealth, nationally, and internationally.

Two faculty in the Department recently launched the Human-Environment Linkages Program (HELP), which represents a new direction for the Department of Geography and Geology (see more on this initiative below in Section I).

5. Contributions to Diversity Goals:

The Department has a long history of integrating issues of ethnic diversity, gender equality, and personal orientation into the curriculum. Both GEOG 101 and GEOG 110, which are general education courses, address issues of diversity and gender both in U.S. society and in cultures across the planet. The Department offers the only courses on campus that deal explicitly with the spatial aspects of diversity and gender. In the Spring 2001 semester, the Department offered a course, cross-listed with Women's Studies, titled Women, Geography, and Development. Many upper-division courses, such as GEOG 360, North America, and GEOG 485 Population and Resources, address issues of ethnic diversity in the United States. In many of the planning courses, significant attention is given to issues of economic and political well-being among African-Americans and other ethnic minorities in U.S. society.

In the Department, females comprise one-third of all majors, a trend that is average for Geography and Geology around the country, whereas most introductory-level classes are at least 50% female, also on a par with national statistics. For example, data from the U.S. Department of Education show that between 1990 and 2001, females earned approximately one-third of all BA/BS degrees granted in Geography [In 2000-2001, 3981 Geography degrees were conferred nationally, of which 1,456 went to females, or 36.5 percent]. The Department has made special efforts in past years to identify, recruit, and hire minorities and females into faculty positions, especially through personal contacts, listservs within the disciplines, recruiting at national and regional conferences, and by word of mouth. Out of twenty full-time faculty, three are female, one is South Asian, and the rest are white males. The Department recognizes that it has work to do in creating a more diversified faculty and it continues to identify ways to attract a broader and more diverse pool of applicants for advertised vacancies.
6. Accreditation Status:

*Not Applicable.* There is no national or regional accreditation body for the discipline of geography.

7. Planning, Development, and other Areas:

A copy of the Department’s 2001-2006 Strategic Plan is attached in Appendix L. All of the issues addressed in the Department’s Strategic Plan have been covered elsewhere in this document. The Department is pro-active in attracting development funds (with the excellent support of staff in the Development office) and it receives a steady flow of donations each year from a core group of alumni. Each year, the Department produces a 30-page alumni newsletter (GEOGRAM), detailing the activities of faculty and students over the preceding year (see 2003 version of the GEOGRAM newsletter in Appendix L). The newsletter is mailed to approximately 1500 alumni and typically results in direct contact from 30-50 alumni each year. This past year the Geology program received a $100,000 gift ($50,000 with a $50,000 state match) from the Gildersleeve family to support student research and travel. In 2001, the Department received a gift-in-kind of 55 acres of farmland from Dr and Mrs James Taylor (a former faculty member in the Department), with a value to be determined upon liquidation of the asset. Cash and in-kind donations from generous alumni contribute to student support each year for travel to conferences, field research sites, and for study abroad programs and field camps.

8. Additional Indicators for Career Preparation Programs:

“The Association of American Geographers (AAG) conducted an extensive survey of employment trends among geography graduates in the 1990s. Not surprisingly, the top three categories of jobs listed were (1) environmental, (2) GIS/Remote Sensing, and (3) cartographer. College professors came in fourth. A large number of recent graduates had found employment in the private sector (40 percent), with slightly over 30 percent finding work in government. Although there is some privatization of government activity, geographers already have a strong foothold in the private sector. Globalization may export jobs to other regions, but high-level skills should continue to find a market in the U.S. The study’s authors pointed out that geography’s great advantage over other liberal arts resided in the ability of it practitioners to combine technical skills with other basic talents such as literacy, numeracy, decision making, problem solving, and critical thinking. This is particularly true for those who can apply their mapping science skills to a range of real world problems, and also those who can impress their employers with the value of a spatial perspective. Fluctuations in the national and global economies always affect the immediate demand. Students who finish during a downturn may have to take a less than optimum position and be patient to climb the ladder. During boom times, graduates must be prepared to take advantage of the range of new job opportunities or to advance in current work settings” (online at: http://www.aag.org/Careers/jobinfo.htm).

Probably the greatest potential for employment growth lies in the area of spatial mapping, GIS, and remote sensing. The Department has identified GIS as a growth area in its curriculum (see Appendix E.1, Tables E.1.6 and E.1.7). Again, according to the AAG (online at: http://www.aag.org/Careers/jobinfo.htm): “While GIS and Remote
Sensing encompass diverse skills and are separate specialties, increasingly the two tools are used jointly to solve problems. The technical specialties offer some of the greatest opportunities, particularly as government and business discover the nearly limitless range of applications for these skills. Those with expertise in these areas can also help with illustrations for publications. Geographic Information Science specialists can find themselves working in almost any situation. Government needs them to manage and analyze environmental, population, and transportation activity. Local governments are turning to GIS to help manage public utilities and land transactions. Business is finding it a powerful means to monitor commercial activity and to manage the movement of goods and services. In some situations a narrow expertise in one GIS software may open the door for a college graduate, but greater opportunity exists for those who have a topical specialty to go along with their technical skills. Finally, whether using satellite images or aerial photographs, there is ample opportunity for those with training in these areas. Analysis of land use/land cover change is vital to agricultural, forestry, and other environmental activities. The U.S. EPA maintains a team that uses historical aerial photographs to track past hazards-related activity. There is also opportunity to employ these tools in diverse military or national security applications.

H. Response to Previous Program Reviews or Other Assessments

The Department submitted a program review in 1998, and received no constructive feedback from the submission. The response to the review was "maintain," with the comment "This appears to be a strong program that also makes a good contribution to general education."

In September 2003, the Department commissioned an external review of the Department, conducted by Dr. Robert Kent, Department Head in Geography and Regional Planning at Akron State University, Ohio. His review summary stated: "This is a strong department. It has a collegial supportive workplace environment. Department members are loyal and display a strong esprit de corps. The Department’s mission includes a strong general education component, besides granting associate degrees in meteorology, bachelors' degrees in geography and geology, and a master's degree in geosciences. Despite the heavy teaching load, faculty members are productive researchers, scholars, and teachers, and also are actively engaged in the local and regional community and indeed throughout the state. The Department is well respected within its college and could be considered one of the college’s more significant departments. The Department has a strong enrollment, many undergraduate majors, and a master’s program. With the recent creation of dedicated computer teaching labs, a GIS center, and a full time GIS lab manager, the Department is well positioned to build additional faculty strength in rapidly expanding areas like GIS and remote sensing. The Department should reinforce its expertise in planning and continue its outreach activities to local and regional planning agencies through internships, contracts, and professional interaction."
I. Future Directions

• Geographical Information Science:
  The growth potential in GIS and related technologies is discussed elsewhere in this document (see also Appendix E.1, Tables E.1.6 and E.1.7). In summary, GIS use has grown exponentially over the past decade and is now pervasive in academia, government, and industry. In environmental monitoring, urban planning, location analysis, public health, criminology, forestry, transportation, utility management and many other fields, the power of GIS is used to analyze spatial data, create comprehensible visual representations, and enhance the decision-making process. GIS technology will only continue to diffuse more widely into society. It is likely that the standard home or office computer of the future will include GIS software, much as word processors, spreadsheets, and presentation software are now standard. In the winter 1999-2000 issue of *ArcNews Online*, Roger Tomlinson, president of Tomlinson Associates and an early leader in GIS development, characterized the future of GIS as a pivotal technology for the twenty-first century:

  Looking at GIS in the new millennium, one starts with the firm expectation that the adoption of GIS societywide and worldwide is inevitable and that GIS users will be advantaged in their work while nonusers will be relatively disadvantaged... An essential foundation of GIS usage is the availability of trained people. Perhaps the entire rate of technology take-up in the first part of the millennium will depend on training. The need is for persons who are geographically literate and able to learn how to use the technology. The training focus must be on the ability to solve geographical problems.

  Western Kentucky University has an unparalleled opportunity to be a leader in this field, building on the foundation of the GIS certificate program already in place. The existing program has been singled out by ESRI Corporation, the developer of leading GIS software, as a distinguished GIS program. The certificate program provides a broad foundation in GIS concepts and techniques, familiarity with a wide variety of data sources and applications. To meet future needs, the program should be enhanced by the addition of advanced courses that focus on specialized and in-depth use of GIS in particular fields and by the greater integration of GIS into all geoscience courses. To achieve these goals, expanded lab facilities to accommodate larger number of classes and students and a commitment to ensuring adequate numbers of GIS-trained faculty are needed.

• Environmental Science:
  The Department plans to take a leadership role in developing and promoting environmental science at the University. Geography is uniquely holistic and such a vision is required to pull together the disparate elements of environmental science. The Department is well-suited to coordinate individual research programs across the University and it can help to develop a curriculum for both undergraduates and graduate students. The idea is not to direct what research is to be performed, but rather to encourage synergies with other departments for grant writing while creating a standard educational curriculum. A logical outgrowth would be the development of a joint Ph.D. program with the University of Kentucky so that each institution could share its expertise for the benefit of everyone.
Two faculty in the Department recently launched the Human-Environment Linkages Program (HELP), which represents a new direction for the Department of Geography and Geology. HELP is not just a new research lab, although cutting-edge research will occur here. The mission of HELP is to extend the benefits of research into the community by conducting research of local, national, and global significance and then disseminating that research to a variety of outlets. Environmental issues specifically commonly have both a scientific and a policy dimension and the HELP hopes to overcome the traditional failure to incorporate each in academic analyses. Coursework will focus on small sessions of motivated students doing research on environmental issues. A key component of the courses will be dissemination of the findings by the students through presentations at local high schools and to other interested stakeholders. This particular approach is unique among Kentucky institutions.

HELP offers students training in computer skills, mapping, synthesis of data, and presentation skills all focused on research issues with “real-world” significance. This training and experience will be useful for students across their disciplines, it should improve retention, and it could open more career and graduate school opportunities. For example, both HELP’s Residential Radon and Karst Stormwater projects have been successful areas of undergraduate research. Students have presented their findings at research conferences and to area high schools over the past year.

Related to this is an unexploited departmental expertise in hazards research. This is a unique but pressing gap in state expertise that the Department could fill, as it has both geographers and geologists. Radon, quartz, flooding, West Nile Virus, sinkhole collapse, drought, homeland security, and even mid-continent earthquakes are all aspects that the Department could address. For example, existing faculty could develop a medical geography course and could research the emergence of new health risks such as West Nile Virus, new outbreaks of malaria, dengue fever, and SARS, as well as ecological vulnerabilities such as limits to food production due to global climate change.

**Meteorology and Climatology:**

The Meteorology/Climatology track in Geography continues to be the most popular among geoscience majors and is poised for significant growth. The Department receives an average of 100 to 150 inquiries per year from prospective students interested in studying meteorology and climatology, far more that any other specialization. Nearly all pre-declared geography majors enter the Department under this track. This trend appears steady through time, with no indication of lessening, in part because the Meteorology/Climatology track is the only such specialized program in Kentucky and Tennessee. The data support regional recognition of this vibrant program, as it is strategically located and has tremendous potential to achieve national recognition.

Recently added coursework has allowed the Meteorology/Climatology program to meet the minimum coursework required by the American Meteorological Society to bestow its ‘Seal of Approval,’ to the Department’s Broadcast Meteorology students. This is an important first step towards the Department’s goal of achieving an accredited “Minor in Meteorology.”

The development of environmental monitoring capabilities in conjunction with the Kentucky Climate Center, and the increased awareness of the impacts of weather and climate on social and economic well-being, are expected to drive continued growth in
student enrollment and opportunities for graduates in environmental careers. To meet future needs, the program should be enhanced by the addition of advanced courses that focus on in-depth use of forecasting models, radar-based remote sensing, environmental monitoring networks, and GIS. To reach these goals, expanded laboratory facilities are essential to accommodate the already high student demand. New and expanded coursework is required, along with additional faculty, trained in model-based atmospheric science. The new courses and facilities are an integral part of the Department’s future growth strategy. This growth is hindered, at this point, by an insufficient number of faculty.

• **Geoscience Outreach:**

  Outreach is another area of potential growth for the Department, which has the faculty expertise to address many local, national, and international problems. Through the Hoffman Environmental Research Institute, the Center for Cave and Karst Studies, the Kentucky Climate Center, and the Human Environment Linkages Program, the Department could expand its outreach opportunities, including local presentations, regional workshops, and media outlets. The faculty have a duty to the community to assist in issues of concern, especially hazards, and the Department is uniquely positioned to offer expertise for public planning and policy.

  Increased awareness of short-term climatic variability and concern about potential long-term change has contributed to growing interest in environmental monitoring from the local to the global scale. The Kentucky Climate Center is aggressively pursuing a strategic goal to develop a statewide environmental monitoring system. Realization of this goal will enhance Western Kentucky University’s national reputation for education, research, and service in the environmental sciences. The availability of real-time environmental data will greatly benefit the Department’s program in meteorology and climatology. In addition, the system will provide a basis for developing educational outreach programs for students and teachers in P-12. Finally, real-time environmental data have been demonstrated to have economic value and will create opportunities to develop value-added products for the public and private sectors. Efforts are currently underway through the University to acquire external funding for system infrastructure, and an ongoing commitment by the University will be necessary to realize the full range of opportunities created by this system.

• **Summary:**

  The Department is well-placed to take advantage of changing technologies and new approaches to geoscience teaching, research, and service. It serves an important role in Ogden College and in the institution, both in terms of providing important general education courses and in terms of providing training in GIS and other spatial-analytical geoscience techniques. The faculty are productive in all areas and continually engage students for success in a global society. The Department requests an “Enhance” designation to allow it to expand in the areas of GIS, geoscience techniques, and student-centered learning.
Appendix A. Publications by Geography Faculty, 1998-2003

PR (peer reviewed)

Katie Algeo, Ph.D. [2001]


Book and Software Reviews:

John All, Ph.D., J.D. [2002]


Kevin Cary, M.S. [2002]

Nicholas Crawford, Ph.D.


(2000) with Brackman, T.B. (graduate student), Parker, R.G. (graduate student), Curry, W.A. (graduate student), Ek, D.A. (graduate student), Larson, R.A. (graduate student), Ryan, G.G. (graduate student), Gossett, J.M. (graduate student), Meredith, J. (graduate student) and D. Huffines. Investigation of Gasoline Vapors Rising from a Karst Aquifer into Greenwood Park Church of Christ and the Foundation Christian Academy, Bowling Green, Kentucky. Proceedings of Mammoth Cave National Park’s Eighth Science Conference.


**Technical and Other Reports:**
(1998-2003) 73 technical and other reports to clients, attorneys, public agencies, and other constituents (see detail in Appendix J).

**Richard Deal, Ph.D. [2001]**
Stuart, Foster, Ph.D.


Technical Reports:

(2003) A Model of Spatial Precipitation Gradient of Heavy Precipitation Events to Estimate the Probability of Extreme Differences in Precipitation Totals at Proximate Locations. Kentucky Climate Center and Center for Cave and Karst Studies, WKU.


Chris, Groves, Ph.D.
(In review) with Liu, Z., D. Yuan, J. Meiman, G. Jiang, and S. He. Controls on South China Karst Aquifer Storm-Scale Hydrochemistry. Ground Water. (PR)


(2002) with Glennon, J.A. An examination of perennial stream drainage patterns within the Mammoth Cave watershed. Journal of Cave and Karst Studies 64: 82-91. (PR)


**Technical and other Reports:**


**David J. Keeling, Ph.D.**


Book Reviews:
(In press) Review of “Understanding the City: Contemporary and Future Perspectives" by John Eade and Christopher Mele (eds.) in Area (Journal of the Institute of British Geographers).


Editorials, Commentaries, and Editorships:


**Stephen Kenworthy, Ph.D. [2003]**


**Rezaul Mahmood, Ph.D. [2001]**

(In Review) with Legates, D. R. and Meo, M. Soil water availability and potential rainfed rice productivity in Bangladesh: A CERES-Rice Model-based Assessment. *Applied Geography*. (PR)


**L. Michael Trapasso, Ph.D.**


(2003) with et.al. Computer Exercises in Meteorology, ERIC-ChESS Clearinghouse for Social Studies and Social Science Education. Online Educational Resources, Social Studies Development Center of Indiana University, Bloomington, Indiana.


(2000) with Tim Troutman. Utilizing Established Techniques in Forecasting the Potential for Derecho Development. Preprints to the 20th AMS Severe Local Storms Conference, Orlando, Florida. (PR)


(1999) with Larissa Keith. Relationships Between Selected Meteorological/Pollution Parameters and Hospital Admissions for Asthma, Journal of the Kentucky Academy of Science 60(2): 73-77. (PR)


Book Reviews:
Appendix B. Academic Presentations by Geography Faculty, 1998-2003

Katie Algeo, Ph.D. [2001]
(2001) *Appalachian Stereotypes: An Epistemological Snapshot.* Invited lecture given at Ball State University, October.

John All, Ph.D., J.D. [2002]


Kevin Cary M.S. [2002]

(2002) The GIS Program at Western Kentucky University. Middle Tennessee Forum on Geographic Information Systems, October, Nashville.


Nicholas Crawford, Ph.D.
(1998-2003) 75 presentations at universities, conferences, meetings, and other settings (see detail in Appendix J).

Richard Deal, Ph.D. [2001]


Scott Dobler, M.S. [2000]


Stuart, Foster, Ph.D.


Chris, Groves, Ph.D.


Regional:


(1999) with Curry, W. Evaluation of karst aquifer sedimentation rates using Cesium 137 from open-air nuclear weapons testing as a tracer. Kentucky Academy of Science, Richmond, Kentucky.


Seminars:


(2001) *GIS, Landscape Evolution, and Big Fun in the South China Karst.* Department of Geography and Geology, Western Kentucky University, Bowling Green, Kentucky.


(2000) *Carbon Dioxide Work at Mammoth Cave,* Kentucky. Department of Physical Geography, University of Liege, Liege, Belgium (in English translated into French).

(2000) with CO$_2$/Landscape Interactions in the Central Kentucky Karst. Institute of Karst Geology, Chinese Academy of Geological Sciences, Guilin, China (in English).

David J. Keeling, Ph.D.

Conferences:


(1999) *Urban, Political, and Economic Research in Latin America During the 1990s.* (Geography in America Project), Annual Conference, AAG, Honolulu, HI, March.


**Invited Academic Presentations:**


(2001) *Power, Production, and Polarization: Regenerated Landscapes as Socio-Political Statements.* Department of Geography and Geology Seminar Series, Western Kentucky University, January.


(1999) *Argentina at the Millennium: Optimism and Opportunity or Crisis and Chaos?* Geography Awareness Week Seminars, Middle Tennessee State University, Murfreesboro, November.

(1999) **The Role of Landscape Change in Geoscience Analysis**. Department of Geography and Geology Seminar Series, WKU, September.


(1999) **Latin America at the Millennium: New Directions, Familiar Crises**. Visiting Professor Series, Department of Geography with Latin American Studies, University of Ohio, Athens, April.

(1999) **Life in Hong Kong after the British: Development Patterns and Changing Urban Dynamics**, Department of Geography and Geology Seminar Series, Western Kentucky University, January.

(1998) **Urban Development, Economic Growth, and Globalization in Pacific Asia**. Lecture Series, Department of Geography, Hong Kong Baptist University, China, November.

(1998) **Globalization and Emerging World Cities in Asia**. Visiting Lecture Series, Department of Geography, The University of Hong Kong, China, November.

(1998) **Crossing the Millennium Rubicon: The United States, Latin America, and the Fate of Nations**. The School of International Studies Visiting Lecture Series, University of the Pacific, Stockton, California, October.

(1998) **The Rhine-Main-Danube Canal: Continental Artery or White Elephant?** Faculty/Graduate Seminar Series, Department of Geography & Geology, Western Kentucky University, September.

(1998) **Urban Landscape Change in Argentina: The Case of Buenos Aires**. Department of Sociology and Anthropology, Middle Tennessee State University, Murfreesboro, April.

(1998) **The Coffee Commodity System in Huatusco, Mexico**. Anthropology Club, Middle Tennessee State University, Murfreesboro, April.

(1998) **A Basic Gravity Model Approach to Theorizing the Economic Potential of Transport Improvements in Mexico**. Faculty/Graduate Seminar Series, Department of Geography and Geology, Western Kentucky University, Bowling Green, January.

Other Lectures:

(2003-1998) 29 Guest Lectures in University Courses

**Stephen Kenworthy, Ph.D. [2003]**

(2002) **Streambed Mobility and Dispersal of Aquatic Insect Larvae: Results From a Laboratory Study**. Poster presentation at the American Geophysical Union Fall Meeting, San Francisco, California.

**Debbie Kreitzer, M.S. [1999]**

(2002) with James M. Bingham, and Stuart A. Foster. The Heritage Corridor: Local endeavors, Global Implications. Kentucky Academy of Science Joint Meeting, Northern Kentucky University, Highland Heights,


Rezaul Mahmood, Ph.D. [2001]


L. Michael Trapasso, Ph.D.


Appendix C. Grant Activity by Geography Faculty, 1998-2003

Katie Algeo, Ph.D. [2001]

Internal:

External:

John All, Ph.D., J.D. [2002]

Internal:
(2003) WKU Sponsored Projects. Travel Grant to China for Source Water Protection Seminar and International Climate Change Program Meeting. Received. $963.
(2003) Office of the Dean, Ogden College, WKU. Travel Grant to China for Source Water Protection Seminar and International Climate Change Program Meeting. Received. $800.
(2003) Department of Geography and Geology, WKU. Travel Grant to China for Source Water Protection Seminar and International Climate Change Program Meeting. Received. $800.

External:
(2003) National Science Foundation CAREER Grant. *Global Climate Change and Pest Insects in the Northern Rocky States*. In Preparation. $500,000.


**Kevin Cary M.S. [2002]**

**Internal:**
(2002-2003) Submitted a proposal in October for mapping the WKU campus to Facilities Management and Information Technology. In April 2003, the GIS Facility was awarded $10,000 for a portion of the project’s first stage by Information Technology, which has agreed to fund the entire first stage of the project. The first stage of the project encompasses digitizing subsurface features that are relevant to Information Technology, such as telephone wires and video cable. The current status of the project is in progress. Funded $10,000.

**Nicholas Crawford, Ph.D.**

**External:**
(1998-2003) 121 grants and contracts submitted. $00.000 requested and $00.000 funded (see detail in Appendix J)

**Stuart, Foster, Ph.D.**

**External:**

(2001) with C. Groves, F. Siewers, M. Prante, D. Keeling, and M. May, IMPACT KENTUCKY!, CPE 2000-02 Regional University Excellence Trust Fund, Submitted for $408,000, Funded for $87,000.

(2000) Natural Hazards and Their Impacts on Agricultural and Urban Development in the Barren River Area, Kentucky Department of Agriculture and the Barren River Area Development District. Funded for $10,000.

**Chris, Groves, Ph.D.**

**Internal:**
(2003) Kentucky Digital Vectorized Geologic Quadrangles. WKU Action Agenda (with match from the Source Water Protection Program and the Kentucky Climate Center), total $7,000 (funded).

(2001) WKU Summer Faculty Fellowship. Landscape/Atmosphere CO₂ Interactions in the Tower Karst Region of the Li River Valley, Guanxi Province, China. $5,000.

(2001) WKU Faculty Research Grant. Landscape/Atmosphere CO₂ Interactions in the Tower Karst Region of the Li River Valley, Guanxi Province, China. $1,000.

(2000) WKU Faculty Research Grant Evolving Caverns and Dissolving Cathedrals: A Cooperative Research and Exchange Program Between WKU’s Hoffman Environmental Research Institute and the School of Geography, Oxford University, England. $1,000.
External:

(2000) WKU Development Grant for travel to the Karst Institute of the Chinese Academy of Geological Sciences, Guilin, China (with graduate student Alan Glennon). $4,138.


(2003) with D. Granger, I. Sasowsky, and F. Siewers. Cave Sediment Dating of River Incision and Landscape Evolution in the Geologically Active Areas of Southwest China. Grant proposal submitted to the National Science Foundation’s Kentucky EPSCoR Program, $25,000 (not funded).


(2002) Source Water Protection Program (Task 3) for the WKU Technical Assistance Center for Water Quality. US Environmental Protection Agency Office of Water. Funded $126,123. (This is part of the proposal by Taylor, R., C. Groves, and O. Meier WKU Technical Assistance Center for Water Quality, US Environmental Protection Agency Office of Water, total $447,075 (funded)).


(2001) with R. Mahmood and S. Foster. Flooding in Karst Watersheds: A Hydro-meteorological and Hydrogeomorphic Analysis, Kentucky EPSCoR Research Incubation Grant, $20,000 (not funded).

(2001) with R. Taylor. GIS Analysis of Groundwater Sensitivity in Kentucky. U.S. Environmental Protection Agency (as part of WKU's new Center for Wastewater Research, total funding $500,000), $71,728 (funded).


(2001) with R. Taylor. Western Kentucky University Source Water Protection Initiative, U.S. Environmental Protection Agency (as part of WKU's Technical Assistance Center for Water Quality, total funding $500,000), $163,000 (funded).


(2000) with Houston, W.E. Western Kentucky University Source Water Protection Initiative, U.S. Environmental Protection Agency (as part of WKU's Technical Assistance Center for Water Quality, total funding $500,000), $132,000 (funded).


(1999) with W.E. Houston. Western Kentucky University Source Water Protection Initiative, U.S. Environmental Protection Agency (as part of WKU's Technical Assistance Center for Water Quality, total funding $500,000), $178,000 (funded).

(1998) Travel Funding for Foreign Karst Scientists to Attend the 1998 International Meeting of the International Geologic Correlation Program, Project #379: Karst Processes and the Global Carbon Cycle. American Chemical Society, $2,000; National Park Service, $8,000; Cave Research Foundation, $2,000 (funded).


David J. Keeling, Ph.D.

Internal:

(2000) Sponsored Programs Research and Travel Grants, WKU ($2500)
(2000) Faculty Research Scholarship, Western Kentucky University, April ($1000).
(2000) Faculty Development Grant, Western Kentucky University, March ($250).
(1999) Faculty Development Grant, Western Kentucky University, January ($250).
(1998) Faculty Development Grant, Western Kentucky University, February ($200).

External:

(2002) Ministry and Land and Resources Travel Support Grant, Guilin, China ($500).
(2000) Ministry of Land and Resources Travel Support Grant, Guilin, China ($500).
(2000) NSF/AAG Conference Travel Grant (IGU), July ($1,000).

Rezaul Mahmood, Ph.D. [2001]

Internal:


(2003) with Stuart Foster. Joint initiative on local and regional hydroclimatic research. Applied Research and Technology Program (ARTP), Western Kentucky University. Funded $25,000.


External:


**L. Michael Trapasso, Ph.D.**

**Internal:**

(2003) Faculty Development Grant, $750.00,

(2001) Faculty Development Grant from Ogden College and the Department of Geography and Geology for travel funds to the ISB International Conference in Greece, $500.00

(1998) Faculty Research Grant for my research in the Antarctic, $1,000.00

**External:**

(2002) Perkins Grant Award for Meteorology Laboratory Computers, $24,765.00

(2000) Used Energy-Related Equipment Grant from the US Department of Energy (Monetary value = $7,000.00)

(1999) National Science Foundation UNIDATA Equipment Grant, $15,000

(1998) Research Grant from the Southern Regional Education Board, Atlanta, GA., for research in the Antarctic, $550.00
Appendix D. Service Activity by Geography Faculty, 1998-2003

Katie Algeo, Ph.D. [2001]

Institution:
Multiple departmental committees, workgroups, and Library Liaison.

Community and P-12:
(2002) Habitat for Humanity, Allen County, Kentucky, Summer; Helped with home construction.

Discipline:

John All, Ph.D., J.D. [2002]

Institution:
(2003-2004) University Senate Member.
(2003-2004) University Senate Faculty Welfare and Professional Development Committee Member

Community and P-12:
(2003) Kentucky Rock and Sport Trust (KRST), Board Member and Legal Analysis.
(2003) Red Cross Local Disaster Response Team Member.
(2002) Roadside cleanup – Clifty Hollow Road, November.
(2002) Interview for Earth Day Activities, WKYU-FM 91.7 Revolution Campus Radio Station
Discipline:
(2002-2003) U.N. Conference on Climate Variability and Human Health Organizing Committee Member and Promoted to Program Officer.
(2002-2003) Vice President of the Geography Section, Kentucky Academy of Science.

Kevin Cary M.S. [2002]
Institution:
(2002-2003) 35 meetings, conferences, consulting, and data-management discussions about GIS with various campus groups, faculty, students, and unit directors.

Community and P-12:
(2003) Meeting with Bowling Green’s Public Works Department’s GIS Coordinator Kyle Bearden and Assistant City Engineer Jeff Lashlee on a potential storm water project involving GIS, February.
(2003) Hosted a tour and discussion of the GIS Facility to the Bowling Green’s Public Works Department. Those that attended from the Public Works Department where the Public Works Director Emmett Wood, GIS Coordinator Kyle Bearden and Assistant City Engineer Jeff Lashlee, February.
(2003) Participated as a judge in Sigma Xi’s Student Research competition, April.
(2002) Repaired automated weather station located at the sewage treatment planet in Bowling Green and downloaded data from the automated weather station with Dr. Trapasso.
(2002) Represented the GIS program at the Southern Kentucky GIS Users Group meeting at Barren River Health Department, October

Nicholas Crawford, Ph.D.
(see detail in Appendix J).

Richard Deal, Ph.D. [2001]
Institution:

Community and P-12:
(2003) Judge, Sigma Xi Western Kentucky Student Research Conference, April.
Discipline:

Scott Dobler, M.S. [2000]
Institution:
(2001-2003) Advisor for Taiwanese Student Association
(2001-2002) Coordinated the delivery and filing of 20,000 maps and file drawers that were donated to the department.

Community and P-12:
(2002) Science Days - Presenter with the Kentucky Climate Center.
(2002) Science Olympiad - Coordinator for Geoscience, and judge
(2001) Designed and built a stream table for Rockfield Elementary on a school budget of $50.00.
(2001) Regional science fair judge at Moss Middle School.
(2001) National Geographic Geography Bee state judge, University of Louisville.
(2001) Attendance of Kentucky Geographic Alliance meeting in Beaver Dam.
(2001) Attendance and presenter at Region 7 Geography academy in Morehead, KY.
(2000) Participant in Science Days at WKU.
Stuart, Foster, Ph.D.
Institution:
Western Kentucky University, Faculty Grievance Committee
Western Kentucky University, Program Review Committee
Western Kentucky University, Ogden College Facilities Planning Committee

Community and P-12:
Bowling Green/Warren County GIS Consortium, Technical Committee
Bowling Green/Warren County GIS Consortium, By-Laws Committee
Southern Kentucky GIS Users Group
Water Availability Advisory Group, Kentucky Division of Water, Frankfort, KY
State Climatologist for Kentucky

Numerous interviews for local and regional media, including Park City Daily News, Cincinnati Post, Louisville Courier-Journal, Lexington Herald-Leader, and WBKO TV.

Daily activities of the Kentucky Climate Center responding to hundreds of requests for data and advice each year.

Ogden College Science Days, September, 2001

Discipline:
Kentucky Science Olympiad, April 20, 2002
Presented professional in-service to employees of Image Entry, Incorporated of London, KY, November, 2001
Conducted field surveys to identify potential sites for the NOAA, NCDC, U.S. Climate Reference Network (activity in progress)
Hosted the Logan County Home Educators group in the Kentucky Climate Center, November 2001

Chris, Groves, Ph.D.
Institution:
(1996-1999) University Graduate Council (alternate).

Community and P-12:
Discipline:
(1996-present) Member, national Board of Directors, Cave Research Foundation.

(1998-2003) Reviewer of 28 manuscripts for the following refereed journals:
*Water Resources Research* (2)
*Journal of Hydrology* (12)
*Ground Water* (8)
*Geochimica et Cosmochimica Acta* (1)
*Bulletin of the Geological Society of America* (1)
*Chemical Geology* (1)
*National Speleological Society Bulletin* (1)
*Hydrogeological Journal* (1)
*Journal of Hydrologic Sciences* (2)

(1998-2003) Service as a Grant Proposal Reviewer:
Cave Research Foundation Graduate Fellowship and Grant Program.

David J. Keeling, Ph.D.
Institution:
(2002-03) Chair, Department Head Search Committee, Physics and Astronomy.
(2002-03) Member, Study Abroad Advisory Committee.
(2001-02) Department Head Representative, Ogden College Dean's Search Committee.
(2001-02) Representative At-Large, University Senate Faculty Status and Welfare Committee.
(2001) Search Committee Member, Study Abroad Advisor, International Programs.
(2000-01) Senator, University Senate, Representing the Department of Geography and Geology.
(2000-01) Member, Budget Sub-Committee for Strategic Planning.


(1999-03) Member, Ogden College Graduate Curriculum Committee.

(1999-03) Member, Ogden College Curriculum Committee.

(1999-00) Member, University Tuition Policy Workgroup.

(1999-00) Member, Faculty Regent’s Advisory Council.

(1999) Member, Assistant Director of International Programs Search Committee.

(1998-00) Member, University Budget Council (Ogden College Representative).


**Community and P-12:**

(2003) *American Society and the Aftermath of September 11*, Outlook, with Barbara Deeb, WKYU-TV, Western Kentucky University, September.


(2000) Geography Outreach (4 lectures), Greenwood High, Bowling Green, May.
(1999) Geography Outreach (2 lectures), Greenwood High, Bowling Green, November.
(1999) Geography Awareness Week Speaker, Middle Tennessee State University.
(1999) Master of Ceremonies, National Geography Bee, Kentucky Finals, University of Louisville, April.

**Discipline:**
(2003) American Geographical Society Lecturer, Hidden Treasures of Europe Educational Tour, May/June: *Hidden Urban Treasures of Europe; European Union Expansion and Integration*; and *Seville - A Bridge Between the Old and New Worlds*.
(2002-04) President, Conference of Latin Americanist Geographers.
(2002) *From Patagonian to the World: Chile in the Global Economy; Ecology and Ecotourism at the End of the World; and The Falkland/Malvinas Conflict and Resource Competition*. Lectures for the American Geographical Society Study Tour, Chile, November.
(2001-02) Search Committee, New Editor of the *Geographical Review*.
(2000-02) Vice President, Conference of Latin Americanist Geographers.


(1999-00) Chair, Latin American Specialty Group of the AAG.

(1999-00) Editor, *Geography and Geology Proceedings* of the Kentucky Academy of Science.

(1999) *Brazil 2000. Study Abroad Opportunities*. Departments of Sociology, Anthropology, and Geography, Middle Tennessee State University, Murfreesboro, November.


(1998-01) Board of Directors, Conference of Latin Americanist Geographers (CLAG).


(1998-03) Publications Committee Member, CLAG.


(1998) Conference Organizer, Annual Meeting of the Midwest Association of Latin American Studies, Western Kentucky University, Bowling Green, October.


(1998-99) Vice-Chair, Latin American Specialty Group of the Association of American Geographers.


(1998) Session Chair, Annual Conference of the AAG, Boston, March.

**Manuscript Reviews and Other Professional Service:**


Stephen Kenworthy, Ph.D. [2003]
New Faculty, Fall 2003.

Debbie Kreitzer, M.S. [1999]
Institution:
(2003-2000) Mammoth Cave Field trips for GEOG 100 and GEOG 280 classes.
(2002) Department Representative for Focus on Western.

Community and P-12:

Rezaul Mahmood, Ph.D. [2001]
Institution:
Multiple service activities in the Department.

Discipline:
(2003) Organizer and Chair, Special Session in Hydroclimatology, at the 99th annual meeting of the AAG, New Orleans, Louisiana.
(1998-2003) Reviewed manuscripts for:
  International Journal of Climatology
  Climate Research
L. Michael Trapasso, Ph.D.

**Institution:**
Judging in Student Competitions: 11
Guest Lectures (On and Off Campus): 54
Masters and Ph.D. (as an outside committee member) Committees: 10
Organizational Committee Membership: University and Departmental: 7
University Recruitment Trips: 10

**Community and P-12:**
   Media Interviews (TV, Radio, Newspapers): 53

**Discipline:**
Outside Reviewer (Books, Magazines, Journals, Web sites): 12
Organizational Committee Membership: Off-campus: 4
Appendix E.1. Comparative Data, Geography Program

Table E.1.1. Geography Program Majors

<table>
<thead>
<tr>
<th>Semester</th>
<th>Met. Tech</th>
<th>Met. Tech Prep</th>
<th>Geography Prep (1)</th>
<th>Geography</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fall 2003 (2)</td>
<td>5</td>
<td>0</td>
<td>116</td>
<td>62</td>
<td>183</td>
</tr>
<tr>
<td>Fall 2002</td>
<td>5</td>
<td>0</td>
<td>48</td>
<td>81</td>
<td>134</td>
</tr>
<tr>
<td>Fall 2001</td>
<td>5</td>
<td>1</td>
<td>51</td>
<td>66</td>
<td>123</td>
</tr>
<tr>
<td>Fall 2000</td>
<td>2</td>
<td>8</td>
<td>52</td>
<td>63</td>
<td>123</td>
</tr>
<tr>
<td>Fall 1999</td>
<td>2</td>
<td>4</td>
<td>39</td>
<td>87</td>
<td>132</td>
</tr>
<tr>
<td>Fall 1998</td>
<td>6</td>
<td>2</td>
<td>36</td>
<td>97</td>
<td>143</td>
</tr>
</tbody>
</table>

(1) Students who have declared a Geography major but who have not yet filed a degree program.
(2) Fall 2003 semester majors data come from Department records.
Source: Fall 1998-2002 data provided by Institutional Research.

Table E.1.2. Geography Credit Hours Produced

<table>
<thead>
<tr>
<th>Semester</th>
<th>Credit Hours</th>
<th>FTEF</th>
<th>SCHP/FTEF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spring 2004</td>
<td>5,538</td>
<td>16.25</td>
<td>341</td>
</tr>
<tr>
<td>Fall 2003</td>
<td>5,351</td>
<td>17</td>
<td>315</td>
</tr>
<tr>
<td>Spring 2003</td>
<td>5,874</td>
<td>15.5</td>
<td>379</td>
</tr>
<tr>
<td>Fall 2002</td>
<td>5,415</td>
<td>15.5</td>
<td>349</td>
</tr>
<tr>
<td>Spring 2002</td>
<td>5,091</td>
<td>14.5</td>
<td>351</td>
</tr>
<tr>
<td>Fall 2001</td>
<td>4,748</td>
<td>13.5</td>
<td>352</td>
</tr>
<tr>
<td>Spring 2001</td>
<td>5,439</td>
<td>13.5</td>
<td>403</td>
</tr>
<tr>
<td>Fall 1999</td>
<td>6,021</td>
<td>15</td>
<td>401</td>
</tr>
<tr>
<td>Fall 1997</td>
<td>5,979</td>
<td>14</td>
<td>427</td>
</tr>
</tbody>
</table>

Table E.1.3. Geography Majors compared to other Kentucky Institutions

<table>
<thead>
<tr>
<th>Year</th>
<th>WKU*</th>
<th>UofL</th>
<th>UK</th>
<th>NKU</th>
<th>MSU</th>
<th>MoSU</th>
<th>EKU</th>
</tr>
</thead>
<tbody>
<tr>
<td>2003</td>
<td>178 **</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2002</td>
<td>127</td>
<td>49</td>
<td>64</td>
<td>16</td>
<td>3</td>
<td>23</td>
<td>32</td>
</tr>
<tr>
<td>2001</td>
<td>116</td>
<td>50</td>
<td>60</td>
<td>13</td>
<td>12</td>
<td>14</td>
<td>37</td>
</tr>
<tr>
<td>2000</td>
<td>113</td>
<td>43</td>
<td>68</td>
<td>14</td>
<td>11</td>
<td>13</td>
<td>45</td>
</tr>
<tr>
<td>1999</td>
<td>117</td>
<td>55</td>
<td>60</td>
<td>13</td>
<td>15</td>
<td>16</td>
<td>47</td>
</tr>
<tr>
<td>1998</td>
<td>120</td>
<td>58</td>
<td>60</td>
<td>9</td>
<td>14</td>
<td>13</td>
<td>56</td>
</tr>
</tbody>
</table>

* Significant under-reporting of majors is occurring at WKU.
** Designated majors in Geography (674) based on Department records.
Department of Geography and Geology (Geography Faculty)

<table>
<thead>
<tr>
<th>Year</th>
<th>Submitted</th>
<th>Funded</th>
<th>Total Grants and Contracts</th>
</tr>
</thead>
<tbody>
<tr>
<td>2003 YTD</td>
<td>$7,326,767</td>
<td>$121,946</td>
<td>41</td>
</tr>
<tr>
<td>2002</td>
<td>$2,277,593</td>
<td>$796,256</td>
<td>60</td>
</tr>
<tr>
<td>2001</td>
<td>$3,865,200</td>
<td>$706,295</td>
<td>63</td>
</tr>
<tr>
<td>2000</td>
<td>$2,901,040</td>
<td>$1,101,040</td>
<td>17</td>
</tr>
<tr>
<td>1999</td>
<td>$1,369,293</td>
<td>$460,793</td>
<td>13</td>
</tr>
<tr>
<td>1998</td>
<td>$661,750</td>
<td>$167,250</td>
<td>10</td>
</tr>
<tr>
<td>TOTAL</td>
<td>$18,401,643</td>
<td>$3,353,580</td>
<td>204</td>
</tr>
</tbody>
</table>

Table E.1.5. Geography Faculty Publications and Academic Presentations, 1998-2003

<table>
<thead>
<tr>
<th>Faculty Member - Date</th>
<th>Publications</th>
<th>Presentations</th>
<th>Technical Reports and Reviews</th>
</tr>
</thead>
<tbody>
<tr>
<td>Algeo, Katie [2001]</td>
<td>7</td>
<td>7</td>
<td>1</td>
</tr>
<tr>
<td>All, John [2002]</td>
<td>3</td>
<td>11</td>
<td>-</td>
</tr>
<tr>
<td>Crawford, Nick</td>
<td>16</td>
<td>75</td>
<td>73</td>
</tr>
<tr>
<td>Deal, Richard [2001]</td>
<td>1</td>
<td>2</td>
<td>-</td>
</tr>
<tr>
<td>Foster, Stuart</td>
<td>2</td>
<td>13</td>
<td>3</td>
</tr>
<tr>
<td>Groves, Chris</td>
<td>20</td>
<td>73</td>
<td>5</td>
</tr>
<tr>
<td>Keeling, David</td>
<td>15</td>
<td>72</td>
<td>21</td>
</tr>
<tr>
<td>Kenworthy, S [2003]</td>
<td>2</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td>Mahmood, R I [2001]</td>
<td>14</td>
<td>8</td>
<td>-</td>
</tr>
<tr>
<td>Trapasso, L. Michael</td>
<td>17</td>
<td>5</td>
<td>1</td>
</tr>
<tr>
<td>Total</td>
<td>97</td>
<td>267</td>
<td>104</td>
</tr>
</tbody>
</table>

Average per faculty per year\(^2\) | 3 | 8 | 3.25

Notes: 1. Only Ph.D. faculty are listed here, as non-tenured instructors are not expected to present research at conferences or to publish.
2. Pro-rated for faculty that commenced employment since 1998 (6.4 FTEF).
### Table E.1.6. Anticipated Growth of GIS Program, 2003-2008 (Students)

<table>
<thead>
<tr>
<th>Offered</th>
<th>GIS 317</th>
<th>GIS 319</th>
<th>GIS 417/417G</th>
<th>GIS 419/419G</th>
<th>GIS 590</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fall 03</td>
<td>40</td>
<td>20</td>
<td>20</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Spring 04</td>
<td>40</td>
<td>20</td>
<td>-</td>
<td>20</td>
<td>-</td>
</tr>
<tr>
<td>Summer 04</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Fall 04</td>
<td>60</td>
<td>40</td>
<td>20</td>
<td>20</td>
<td>5</td>
</tr>
<tr>
<td>Spring 05</td>
<td>60</td>
<td>40</td>
<td>20</td>
<td>20</td>
<td>-</td>
</tr>
<tr>
<td>Summer 05</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Fall 05</td>
<td>80</td>
<td>40</td>
<td>20</td>
<td>20</td>
<td>10</td>
</tr>
<tr>
<td>Spring 06</td>
<td>80</td>
<td>40</td>
<td>20</td>
<td>20</td>
<td>-</td>
</tr>
<tr>
<td>Summer 06</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Fall 06</td>
<td>100</td>
<td>60</td>
<td>40</td>
<td>40</td>
<td>15</td>
</tr>
<tr>
<td>Spring 07</td>
<td>100</td>
<td>60</td>
<td>40</td>
<td>40</td>
<td>-</td>
</tr>
<tr>
<td>Summer 07</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Fall 07</td>
<td>120</td>
<td>80</td>
<td>60</td>
<td>60</td>
<td>20</td>
</tr>
<tr>
<td>Spring 08</td>
<td>120</td>
<td>80</td>
<td>60</td>
<td>60</td>
<td>-</td>
</tr>
<tr>
<td>NOTES</td>
<td>(3)</td>
<td>(2)</td>
<td>(1)</td>
<td>(1)</td>
<td>(1)</td>
</tr>
</tbody>
</table>

**Notes:**

1. At this time, we can only offer one advanced course in the Fall (417) and one advanced course in the Spring (419), with the expert-level course (590) only available as a supervised research course (limited to one or two students depending on faculty time).
2. We can only offer one section of GIS 319 each semester (limited to 20 students) because of staffing constraints. This is a required course for the major as well as for the GIS Certificate, and two sections each semester are needed to keep up with demand.
3. Enrollment in GIS 317 is expected to increase steadily over the coming years as we design more specialized sections (GIS for Biology, GIS for Business, etc.) and as student interest in at least being exposed to the basic technical aspects of GIS grows.

### Table E.1.7. Anticipated Growth in the GIS Certificate Program, 2003-2008

<table>
<thead>
<tr>
<th>Academic Semester</th>
<th>Certificates Awarded</th>
<th>75% Complete Program</th>
<th>50% Complete Program</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fall 2002</td>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spring 2003</td>
<td>9</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fall 2003</td>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spring 2004</td>
<td>15</td>
<td>8</td>
<td>14</td>
</tr>
<tr>
<td>Fall 2004</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Anticipated</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fall 2004</td>
<td>6</td>
<td>10</td>
<td>16</td>
</tr>
<tr>
<td>Spring 2005</td>
<td>8</td>
<td>10</td>
<td>18</td>
</tr>
<tr>
<td>Fall 2005</td>
<td>4</td>
<td>8</td>
<td>20</td>
</tr>
<tr>
<td>Spring 2006</td>
<td>10</td>
<td>14</td>
<td>24</td>
</tr>
<tr>
<td>Fall 2006</td>
<td>8</td>
<td>12</td>
<td>24</td>
</tr>
<tr>
<td>Spring 2007</td>
<td>12</td>
<td>16</td>
<td>26</td>
</tr>
<tr>
<td>Fall 2007</td>
<td>14</td>
<td>18</td>
<td>28</td>
</tr>
<tr>
<td>Spring 2008</td>
<td>16</td>
<td>22</td>
<td>30</td>
</tr>
</tbody>
</table>
Appendix F. Undergraduate Program Data
### Appendix G. Selected Alumni Data, 1998-2003

<table>
<thead>
<tr>
<th>Alumnus/a</th>
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Appendix H. Tracks in the Geography and Geology Major and Minor

1. Tracks and Track Requirements in the Geography B.S. Program.

2. Details about the Program and about Minors in Geography.

3. Details about G.I.S. Program

4. Programs in Geology

5. Details about the Geoscience M.S. Program.
Appendix I. System-wide Enrollment and Degree Data
Appendix J.
Report Detail for Dr Nicholas Crawford
and for Dr. Michael May (1998-2003)
### Appendix K. Student Internships (1998-2007)

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Appendix L.
Department Strategic Plan (2001-2006)
Copy of Website Home Page (www.wku.edu/geoweb)
Copy of 2003 GEOGRAM, the alumni newsletter