Proposals must not exceed 8 pages in length (minimum 11 point font), excluding annual Year-End Progress Report. Academic departments within the Division of Academic Affairs are eligible to apply for Unit Productivity Awards. Generally, departments are restricted to submitting a single application per academic year; exceptions may be made with prior approval of the College Dean for those departments housing multiple programs that are independent in terms of faculty, curriculum, and administrative structure.

<table>
<thead>
<tr>
<th>Name of Department:</th>
<th>Geography and Geology</th>
</tr>
</thead>
<tbody>
<tr>
<td>Department Head Name:</td>
<td>Dr. David J. Keeling</td>
</tr>
<tr>
<td>Campus Address:</td>
<td>EST 304</td>
</tr>
<tr>
<td>Email Address:</td>
<td><a href="mailto:David.keeling@wku.edu">David.keeling@wku.edu</a></td>
</tr>
<tr>
<td>Date Submitted:</td>
<td>July 14, 2011</td>
</tr>
</tbody>
</table>

Describe the nature of the department’s initiatives to address one or more divisional priorities below during the most recent academic year. Indicate the nature of the unit’s notable achievements and best practices, and include data on measurable outcomes and indicators of success. It is neither required nor expected that departments will address all priorities below; in fact, a stronger application will likely be one that documents significant, strategic progress related to a limited number of priorities.

**Strategic Goal 1. Enhance academic quality and the WKU Experience for all students.**

**Evidence of successful initiatives to ensure the quality and relevance of academic programs:**

The primary goal of the Department for the 2010-2011 academic year was to complete a thorough review of its academic programs to ensure relevance for its students and for the wider constituency. This analysis took place under the umbrella of a more detailed Program Review for the institution, and included curriculum reassessment, faculty workload, research outcomes, and program relevance. The Department’s mission statement is the guiding philosophy:

**Department Mission Statement:** The Department of Geography and Geology prepares students to be productive, engaged, and socially responsible citizen-leaders of a global society. It provides research, service, and life-long learning opportunities for its students. The Department is responsible for stewarding a high quality of life for its faculty, students, and alumni so that they:

- Recognize science as a way of knowing, including its values and limitations;
- Achieve a depth and range of knowledge and skills in their discipline or in a multidisciplinary area;
- Develop abilities of reason and imagination; collect and analyze data, synthesize and draw conclusions; effectively communicate with others;
- Experience discovery, design, or application within the discipline and beyond;
- Evidence a commitment to an examined and evolving set of values and professional ethics, leading to informed decisions and including contributions to the discipline and to society;
- Become knowledgeable in the discipline, prepared for the future, and competitive in a global environment.

This initiative clearly overlaps with strategies to enhance the recruitment, retention, and graduation rates of our majors. For example, recent IR data revealed that Geography and Geology has an amazingly high (95.77%) retention rate for first semester students. Clearly, recruitment, retention, and graduation are inextricably intertwined with the quality and relevance of the Department’s academic programs. As part of its guiding philosophy, the following approaches for freshmen have been instituted in recent years to ensure that program quality and relevance remain a priority:

(a) Each major has a program leader who is responsible for working directly with incoming freshmen and monitoring their progress through the program.

1. Geography and Geology
(b) Faculty encourage each new major to take GEO 175 University Experience, which allows the instructor to keep close tabs on that crucial first semester experience and to monitor selection of courses for the following semester.

(c) Faculty encourage new majors to get involved in the Department’s various clubs (Geology, Meteorology, Geography) so that they can learn the academic (and social) ropes from experienced students.

(d) Faculty seek out promising new students for research engagement – catch them early and this can set the stage for lifelong research interests.

(e) The Geology program has an award for most promising freshman geologist, and the Department awards modest scholarships for freshmen who demonstrate significant academic potential.

(f) Faculty actively recruit students from the Gatton Academy, as they are engaged, motivated, and interested in the research aspects of the program.

(g) For the Meteorology program especially, the Department sets the bar high for incoming freshmen – faculty want them to have AP classes, a high ACT score, and a good distribution of science and humanities courses in their background. Especially critical here are the Math “gatekeeper” courses – students who have to take developmental courses in Math are 95% more likely to drop out of the program in the first year or to lower their expectations to a major that is less Math intensive.

(h) The Department runs a regular (bi-weekly) faculty-student seminar, featuring student and visitor research presentations, and it strongly encourages all majors to attend, especially those interested in research.

(i) Faculty plant the seed early with promising freshmen to recruit them later for lab positions, peer tutoring, and other paid positions in the department (GIS lab support, e.g.)

(j) Faculty encourage incoming freshmen to start planning for study abroad, study away, field camps, and other types of educational experiences, especially for the sophomore and junior years.

A critical component of any assessment of program quality and relevance is ensuring that pedagogical material is up-to-date and appropriate for the career needs of today’s students. Accordingly, the Department made substantial revisions to its curricula offerings during the academic year:

1. The Environmental Studies Minor (#363) has been completely revised to incorporate courses from other science programs and to offer students more choice in supporting coursework. The revised program focuses more specifically on the physical science aspects of the environment, and is complementary to the Minor in Sustainability, which focuses more specifically on principles, ethics, theories, and empirical case studies.

2. Changes in GIS software and suggestions from employers motivated the Department to add a lab component to GEOG 317 GIS and to increase the credit hours from three to four to account for the increased workload.

3. GEOG 419 has been retitled as GIS Programming to account for the restructured focus of this course.

4. A growing demand for water and karst specialists in the environmental and land-use management fields led to the creation of a new Karst Geoscience concentration in the Geography major (#674). This new area of study supports the growing sophistication of research by students and faculty in the Hoffman Institute and Kentucky Mesonet, among other areas, and is a respond to growing employment opportunities in this area of study.

5. Responding to recent nationwide initiatives to improve recruitment to the STEM disciplines through teacher-training programs, the Department created an MAE for Teacher Leaders in partnership with the Teacher Education program, with concentrations in Geography (Social Studies) and Earth Science. This new MAE program requires 18 hours of content coursework in the discipline and a minimum of 12 hours in Teacher Leader courses.

6. Continued enrollment growth in the B.S. Meteorology major (#578) has led to the development of several new advanced courses in climate science. The goal is to work towards a five-year program of study that incorporates the B.S. and M.S. programs, and to meet all national standards for professional meteorologists.

7. The M.S. Geoscience program has been completely restructured to recognize five primary areas of research and is now solely research-thesis based. As evidence of the quality of the MS Geoscience program, recent graduates Mark Baldwin, Crystal Bergman, Alan Glennon, Narcisa Pricope, Pat Kambesis, Erin Greunke, James Otoo, James Chaney, and Juan Herrera-Escobar are completing their Ph.D. programs at institutions such as Florida, Nebraska, Missouri, Purdue, LSU, and UC Santa Barbara. Other recent M.S. Geoscience graduates have gone on to begin

2 Geography and Geology
Recent independent initiative of employers, the Leeper GIS spatial offerings, and the Leeper GIS Services for Bowling Green-based national nonprofit Connected Nation, was named recently to the inaugural Vanguard Cabinet by URISA - the leading association for GIS professionals. The Vanguard Cabinet is a new URISA initiative to engage young GIS practitioners, increase their numbers in the organization, and better understand the concerns facing future leaders of the GIS community. Recent MS graduate (and meteorology undergraduate) Ronnie Leeper is a research associate with the scientific services division of the National Climatic Data Center in North Carolina and counts his GIS skills as a major contributor to his career success. Gina Cesin, another recent MS Geoscience graduate, along with several other recent graduates, is working as a geospatial analyst in the northern Virginia area. Recent M.S. Geoscience graduate Mark Graham went on to earn a Ph.D. at the University of Kentucky and now studies the spatial effects of technology as a Research Fellow at Oxford University, England.

The curriculum for the professional meteorology and geology majors, along with geography and the Department’s minor offerings, has also been validated this past year by the successful placement of recent graduates. As examples of the myriad successes, TJ Malone is working as a meteorologist for Meridian Environmental Technology in North Dakota, Chelsea Brunner is working towards her Master’s in Earth and Planetary Science at the University of New Mexico, Sarah McCann has begun the meteorology graduate program at Mississippi State, and Astrid Gonzalez is pursuing her Ph.D. at Penn State. All of these success stories point to the relevance and quality of the Department’s academic programs.

Evidence of successful initiatives to advance engaged teaching and learning.

Throughout the 2010-11 academic year, the Department continued its focus on enhancing student engagement through innovative coursework, supervised research, and thesis projects. As the graphic indicates, the Department’s myriad programs allow for significant inter-disciplinary and cluster learning, both within the department (geology and GIS, for example) and across the institution (meteorology and physics, for example). Student engagement is targeted to three specific areas – (a) in the classroom and laboratories; (b) in local and regional areas; and (c) internationally. Success in student engagement is also inextricably intertwined with recruitment and retention strategies, and with a quality and relevant curriculum. This past year, faculty aimed to advance engaged teaching and research through four inter-related approaches: (1) innovative course curricula; (2) student engagement in independent research; (3) participation in local, regional, and national conferences; and (4) participation in field camps.
The geosciences generally are field-based, in that many of the best teaching, learning, and research experiences take place beyond the traditional classroom. The Department continues to create opportunities for students to engage in innovative and creative learning. For example, during the 2010 May summer term, eight students from the Meteorology Program set their sights on severe and often tornadic thunderstorms across the Great Plains. The goal for Dr. Durkee’s inaugural Field Methods in Weather Analysis and Forecasting class was to be able to predict accurately the precise locations of severe convective storms, and then drive to the threat area of interest in time to verify their forecasts; an extremely difficult and tiring task. Dr. Durkee was assisted by Dr. Grady Dixon, assistant professor of meteorology and climatology at Mississippi State University. Each morning the students would analyze atmospheric data and present hand-analyzed weather charts in a discussion about the expected severe weather for the given day, and designating a targeted town to drive to. Along the way, the students would prepare a mid-day assessment and highlight any changes from the morning discussion. Dr. Durkee and Dr. Dixon would weigh in on each discussion, the group would come to a consensus, and on they went. In the end, Dr. Durkee and the students traveled across 14 states and racked up a total of 17 tornado touchdowns (in five states) across the 8,009-mile trek (a distance similar to driving from Bowling Green, Ky., to Anchorage, Alaska, and back). This innovative summer program won the NAASS “Creative and Innovative Program” award, presented at the North American Association of Summer Sessions (NAASS) annual conference in Portland, Maine.

Eleven students and three department faculty members (Drs North, Polk, and Wulff) developed the first Semester At Sea™ Enrichment Voyage with a focus on the “Waters of the Caribbean.” The three courses offered (GEOL 475, GEOG 475, and GEOS 510) represented a collaborative effort between the Semester at Sea™ Program (SAS) through the University of Virginia, the WKU Honors College, and the Department of Geography and Geology. The study abroad program offered students the opportunity to engage in an international field-based science course throughout the Caribbean Sea aboard a state-of-the-art “floating classroom,” the MV Explorer. Students participated in a variety of activities on ten different Caribbean islands, with an emphasis on the integration of geologic, geographic, and environmental issues related to water resources, climate change, and environmental policy. Students explored the natural environment, while simultaneously being immersed in the local cultures, developing an appreciation of the challenges of island life and an understanding of the diversity of the communities of the Caribbean region. The ports of call visited included Nassau (Bahamas), Puerto Rico, St. Kitts, Dominica, Barbados, Grenada, Trinidad, Bonaire, Curacao, and Aruba. Onshore activities included climbing volcanoes, cave exploration and inventory, snorkeling to explore modern carbonate reef environments, visiting a desalination plant and a water barge, and visiting local freshwater sources, such as springs and mountain gorges. The group also had a special invitation from the government of Barbados though the Deputy Consul General, Philip St. Hill, to meet with the Caves of Barbados organization to work on a preliminary cave inventory and feasibility study with regard to turning Cole’s Cave into a wild show cave for educational purposes.

Other field-based learning experiences included the Department’s annual study abroad program (this past summer, a 4,200-mile circumnavigation of northern Argentina studying ecology and environmental change with two faculty (Dr Keeling and Will Blackburn)), regular geology field trips to local and regional sites, and other exciting learning opportunities. For example, seventeen geography and geology students participated in a fieldtrip through the Ozarks of southern Missouri and northern Arkansas as part of a Spring 2011 course in Geomorphology taught by Dr. Jason Polk. The trip was co-led by recent WKU graduate and Hoffman Institute staff member Benjamin Miller, a Missouri native who completed his thesis on complex springs systems in the area, along with WKU Geoscience graduate student Sean Vanderhoff, who is completing a thesis on contaminant transport in cave and karst systems. The purpose of the trip was to engage students in fieldwork related to fluvial and karst geomorphological processes and landforms, along with weathering and tectonic processes. The trip provided them with hands-on experience studying and understanding these complex landscapes. Stops included the largest springs in both Missouri and Arkansas, several cave systems in different geological settings, the Current and Eleven Point River systems, Prairie Hollow Gorge (a rhyolite canyon), and several other unique locations in and around the Mark Twain National Forest area. Students also toured Blanchard Springs Caverns in Arkansas and learned about not only the geomorphology of the show cave, but also about white-nose syndrome, a disease that is decimating bat populations around the country.
Students are also encouraged to present the results of their research at local, regional, and national conferences. Twelve faculty and eighteen students presented research at the 96th annual Kentucky Academy of Science conference, with student presentations an outgrowth of research projects conducted for credit, as part of an M.S. thesis project, or as part of grant-funded research initiatives in the Hoffman Institute, Kentucky Mesonet, or Advanced Materials Institute. Fourteen of the eighteen students were recognized at the KAS conference with awards for outstanding posters and paper presentations. Nine students and five faculty presented their research at the 65th annual SEDAAG conference in Birmingham, AL, and 23 students present their research at the 41st annual WKU Student Research Conference, with four students winning awards for outstanding posters or oral presentations. MS Geoscience student Ann Apperson was selected as Outstanding Geoscience Graduate and Outstanding Ogden College Graduate student for 2010-2011. Ann also received the AAG Cultural Geography Specialty Group national award for outstanding research paper, presented at the annual conference. In addition, four students and eight faculty presented research at the annual Association of American Geographers conference in Seattle, WA.

WKU meteorology student Mitchell Gaines of Versailles finished first overall in a regional weather forecast competition hosted by the University of Georgia. Gaines was one of four students in Dr. Durkee’s Synoptic Meteorology class to finish in the top ten of the forecast competition that included 96 students from WKU, University of Georgia, Northern Illinois University, and Mississippi State University. WKU student Lee Campbell of Paducah finished first in the precipitation category. For the fall semester, the forecast cities included Atlanta; Brownsville, Texas; Glasgow, Mont.; Allentown, Pa.; Huntsville, Ala.; and Muskegon, Mich. The goal of the competition is to help students sharpen their forecasting skills even further than is possible in a regular class environment. Synoptic Meteorology aims to help students understand the theoretical and conceptual underpinnings of the day-to-day evolution of the Earth’s atmosphere. Part of the requirements for the class involved the students’ application of their understanding of Synoptic Meteorology in a forecast setting. Here the students provide routine daily weather forecasts for a select group of cities from around the U.S. throughout the semester. The students took turns beginning each class meeting with a thorough diagnostic discussion of current weather events. After that, the students provide a comparative analysis of numerical weather model prediction output (that they had learned to generate) that came down to a final forecast for high and low temperatures, precipitation, and winds for the next day.

MS Geoscience students have recently been awarded nationally competitive grants from the Cave Research Foundation and Karst Waters Institute and, in June, Ben Miller won the top Young Karst Researcher Award from the International Association of Hydrogeologists. Led by Adjunct Professor Dr. Cari Bourette, eight WKU students studying sustainability were engaged this past Spring semester in a community practicum that addressed the challenge of transitioning to a more sustainable environment. After taking previous courses that examined the concepts of sustainability and the implications of reaching limits to resources in the face of a growing world population, students in the Transition Community Practicum at WKU are preparing for the challenges ahead. The practicum provided a hands-on experience that explored the implementation of strategies to respond proactively to the new reality that post-peak oil implies. Additionally, the Department once again had GIS students selected as interns for the annual International GIS conference in San Diego, which offers only 60 positions each year nationally.

Three meteorology majors and one geoscience graduate student were awarded 2010 Student Career Experience Program (SCEP) internships from the National Weather Service (NWS). Senior meteorology major Brittney Whitehead interned at the Nashville office; senior meteorology major Sam Roberts interned at the Morristown, TN, office; sophomore meteorology major Ian Blaylock interned at the Juneau, Alaska, office; and Geoscience graduate student Andrew McKaughan interned at the Tampa, FL, office. About 60 SCEP internships are awarded nationally. The success of all four WKU students in winning a SCEP internship highlights the important partnership developed with the NWS and its regional offices through the Kentucky Climate Center and the Kentucky Mesonet project. The WKU Meteorology program is one of about 75 meteorology programs nationwide, so for the Department to receive four out of about 60 SCEP awards says a lot about the quality of the program’s students. It is quite possible that the WKU Meteorology led the nation in SCEP awards this year. The highly competitive SCEP internship gives meteorology students valuable work experience at an NWS forecast office under the guidance and direction of their university. Students complete at least 640 hours of hands-on career-related work including forecasting, research and outreach activities. Upon completion of the required work hours and graduation, the SCEP student may be offered a full-time position at the NWS on a non-
Finally, in the area of student research, faculty work closely with individual students, both at the undergraduate and graduate level, to encourage them to complete honors’ theses, to publish the results of their research, and to complete graduate theses in a timely manner. Ten graduate theses were completed during calendar year 2010, and a further six theses were either completed or ready to defend during the first half of 2011. Geology major Matthew Downen completed an Honors thesis titled The Formation History of Multi-layered Chondrules in Acfer-139 (CR2), and environmental geography major Margaret Wilder completed her Honors thesis on the Influence of Prescribed Fire on Late Summer and Fall Herbs of Eastern Mesic Forests. Undergraduates are especially encouraged to publish their research with faculty mentors. This past year, meteorology majors Lee Campbell, Kyle Berry, and Dustin Jordan, working with Drs. Durkee, Goodrich, Mahmood, and Foster, submitted their research titled “A synoptic perspective of the record 1-2 May 2010 Mid-South rain and flood event” to the peer-reviewed Bulletin of the American Meteorological Society, one of the highest profile climate journals internationally, and it has been accepted for publication. Last year’s outstanding Meteorology graduate, Astrid Suárez-Gonzalez (now a graduate student at Penn State), along with Drs Mahmood and two other researchers, published “Impacts of irrigation on dry Season precipitation in India” in the peer-reviewed journal Theoretical and Applied Climatology 204(1-2): 193-207.

Geoscience graduate students Ann Epperson (2010-11 Ogden College Outstanding Student) and Matt Brunt, along with faculty mentor Dr Algeo, published “Historical GIS as a Platform for Public Memory at Mammoth Cave National Park” in a special issue of the peer-reviewed International Journal of Applied Geospatial Research on “Past Informing Place.” Recent M.S. Geoscience graduate and Hoffman Institute researcher Ben Miller published “Delineating Recharge Areas on Onondaga and Cathedral Caves using Groundwater Tracing Techniques” in the journal Missouri Speleology, based on his thesis research.

The Geography, Geology, Meteorology, and Geoscience clubs play important roles in the recruitment, retention, and development of students. These student-led organizations provide mentoring, peer support, research opportunities, seminars, and field-trip experiences for members. For example, Geology Club students raised money and fostered interest in their activities through rock and gem sales, seminars, and tee-shirt sales, and regularly attended annual regional and national geology meetings and conferences. Additionally, this year both undergraduate and graduate geography students helped to run the state-wide National Geographic Bee for grades 4-8 (organized by the Kentucky Geographical Alliance), with faculty and students involved in administering the event. The Bee was held for the eighth consecutive year at WKU, with 100 students and about 165 parents and teachers in attendance. Faculty are also active in the Kentucky Society of Professional Geologists, developing statewide initiatives to introduce students to the geological sciences. Four faculty are engaged in the Kentucky Geographical Alliance (which has received ongoing NGS funding of $50,000 each year), the Science Alliance, and SkyTeach respectively; these initiatives are designed to help improve the content knowledge of K-12 teachers and to improve the geoscience knowledge base of students preparing to attend Kentucky universities. The Department remains hopeful that initiatives such as these will help to attract more students to the geosciences in the future. Finally, the Department continues to offer non-traditional courses in partnership with other programs to appeal to a wider cross-section of the campus community. The Center for Cave and Karst Studies summer program (now in its 33rd year) offered seven different courses centered on Mammoth Cave.

Evidence of successful initiatives to advance diversity and internationalization within the WKU curriculum/community.

Faculty and students gave approximately 75 academic and community talks during the academic year, including presentations at universities, workshops, and conferences across the United States, in Latin America, China, and Europe. In addition, faculty and staff visited more than 20 overseas locations for professional development, research, study abroad programs, professional study tours, meetings, and collaborative activities with other institutions (including Argentina, Borneo, Barbados, Haiti, Canada, Australia, China, Jamaica, Puerto Rico, Cambodia, Tanzania, Jordan, India, Chile, and the United Kingdom). Indeed, the Department has been a leader at WKU over the past decade in Study Abroad program development and participation, with ten faculty leading over 375 students to more than a dozen destinations around the planet, and it has the most globally focused faculty in the Commonwealth; they have visited.
over 130 countries on research and lecture trips in recent years! This Department personifies WKU’s aspirations for cultural diversity and international reach.

Dr. All recently completed a one-year Fulbright assignment in Nepal, teaching and researching environmental change, and he recruited a Nepali student to the M.S. Geoscience program to continue analysis of the data at WKU. Dr All also climbed Mt. Everest as part of the experience. Dr. Kay Gandy, co-director of the Kentucky Geographical Alliance, received an award for the Best College/University article published in the Journal of Geography during 2009, sponsored by the National Council for Geographic Education. The winning article is titled “Writing a Successful Fulbright Group Projects Abroad Grant: Voices from a Journey to South Africa.” Drs Jun Yan and Xingang Fan journeyed to China as part of a U.S. Department of Education UISFL grant designed to contribute to WKU’s growing China initiatives. Their goal is to develop future study abroad programs aimed at understanding the changing environment of China. Geology major and Gatton Academy graduate Shelby Rader spent the Fall 2010 semester at Harlaxton College in England and visited the famous “great unconformity” at Siccar Point as part of her studies. Department Head David Keeling was elected to the international board of editors of the Journal of Transport Geography. Drs Polk and North, representing the Hoffman Institute, attended an environmental justice workshop in China and gave lectures on new initiatives for the China Environmental Health Project.

Department Head David Keeling lectured on an AGS-sponsored around-the-world educational expedition in February 2011, visiting Chile, Peru, Cambodia, India, Australia, Tanzania, Jordan, and Morocco. Four Hoffman Institute faculty visited Barbados in February 2011 to advise the government on the development of cave tours to enhance economic development. Dr Groves continues his leadership role in a UNESCO water project called “Environmental Change and Sustainability in Karst Systems.” IGCP 598 has an international leadership team. In addition to Dr. Groves, the work will be led by Project Director Zhang Cheng of China’s International Research Center on Karst, along with co-leaders Yuan Daoxian and Jiang Yongjun (China), Augusto Auler (Brazil), Martin Knez (Slovenia) and Bartolome Andreo (Spain). Aims of the work include research to better understand how to protect water resources from changes in human land use that can contaminate water supplies; clarify geologic interactions that may influence global carbon cycling and, in turn, climate change; better understand methods for sustainable ecological and cultural resource protection; and refine interpretation of environmental records contained within karst systems. The Swedish government subsequently announced funding support for this global initiative.

The editorial work of Drs Peggy Gripshover and Tom Bell for the American Geographical Society’s Focus on Geography is international in scope, with manuscripts submitted by geographers from around the world.

Evidence of successful initiatives to attract and retain outstanding faculty and staff.

The reputation of the department, its faculty, and students continued to grow nationally and internationally as a result of their productivity in teaching, research, and service. Dr. Chris Groves has been selected as a University Distinguished Professor for 2010-2015, in part because of his ground-breaking work with the China Environmental Health Project and his ongoing commitment to improving the quality of life in Kentucky and beyond through his research. The Department hired Dr. Leslie North, an environmental educator from the University of South Florida, to join the Hoffman Institute in Fall 2011 and to lend significant expertise to teaching and research initiatives in karst geosciences as part of its cluster teaching and research strategies. Dr. Fred Siewers participated as an instructor in the first-ever Honors Faculty Institute in Kentucky, sponsored by the National Collegiate Honors Council. He has also been selected to spend Fall 2012 as a visiting professor at Harlaxton College, England. Dr Jun Yan has been awarded the 2010 Michael Breheny Prize for Best Journal Paper in the peer-reviewed Environment & Planning B. Instructor and co-director of the Kentucky Geographical Alliance Scott Dobler received a Kelly Autism Program Special Award for 2010.

As part of WKU’s revised strategic plan to enhance overall research productivity, the Department has introduced
new workload initiatives to help faculty engage in more rigorous and productive, teaching, research, and grant-writing opportunities. The goal is to provide research-oriented faculty with more flexibility to engage students and colleagues in projects that might lead to extramural funding and publications. Although excellence in teaching remains a priority for the Department, faculty receiving reduced teaching loads are required to demonstrate increased productivity through grant-writing, publications, and other creative activities.

**Evidence of successful initiatives to strengthen the infrastructure for research and service.**

Since the Kentucky Mesonet’s first station at the WKU farm in Warren County became operational in May 2007, 57 stations have been installed towards a goal of 100 stations statewide. The Mesonet stations collect real-time weather and climate data on temperature, precipitation, humidity, solar radiation, wind speed and direction. Data are packaged into observations and transmitted to the Kentucky Climate Center at WKU every five minutes, 24 hours per day, throughout the year and are available online at www.kymesonet.org. The statewide automated environmental monitoring network, directed by Drs Stuart Foster and Rezaul Mahmood, supports a variety of needs across Kentucky in agriculture, education, emergency management, energy, engineering and construction, recreation, transportation, water supply management and weather forecasting. Data generated by the Mesonet system are being analyzed by undergraduates and Geoscience graduate students for projects and theses, with many of the research projects presented at local, regional, and national conferences. The Kentucky Mesonet provides outreach to local communities, enhancing quality of life for people throughout the Commonwealth. Outreach starts by working with local officials and stakeholders to identify sites that meet scientific criteria and provide added community benefits.

Grants written by faculty in the Department have helped to add much needed infrastructure to support research initiatives. Dr. Aaron Celestian, director of the AMI, has received funding of $483,040 for the purchase of a new Bruker APEX-II Quasar single crystal diffractometer, and a simultaneous TGA/DSC/DTA. He also helped to acquire a modern X-ray Diffraction System for Gatton Academy Students ($80,000), which has contributed to materials characterization and AMI research. Other funding in the Kentucky Climate Center and the Hoffman Institute has provided needed support for international and regional research and conference travel, research equipment, and graduate assistantship packages.

Faculty and students remain active in the community, both locally and beyond, and were featured over 70 times in media print, in online articles, on WKYUFM radio, and on local television programs. Faculty are regularly called upon to provide expert commentary and analysis on earthquake risks, weather events, globalization, water resources, and other issues of interest to the local community. Faculty also provide significant service to WKU and to their respective disciplines, including contributions to myriad university and college committees, and work on editorial boards, as reviewers for professional journals, and as elected officials for discipline-centered organizations.

**Strategic Goal 2. Create a sustainable and efficient environment that supports the academic mission.**

**Evidence of successful initiatives to manage academic resources efficiently and effectively.**

- The Department has reduced its reliance on paper resources through more efficient management of printing and copying. Faculty have been encouraged to provide more resources online through Blackboard and to pay more attention to wasteful printing. Overall, paper and copier use has been reduced this past year by 8 percent.
- Faculty have increased their efforts to improve energy efficient, paying more attention to turning off lights and unplugging equipment when not needed. However, the EST building continues to suffer from inefficient air circulation, heating, and cooling, and significant energy resources are wasted each year because WKU has been unwilling to address long-term maintenance problems with the building’s HVAC system. Some efforts have been made this past academic year to address these ongoing problems, including new thermostat controls and a new roof.

8 Geography and Geology