


Fall 2011

Geogram 2011

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Western Kentucky University

WKU Department of Geography and Geology

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GEOGRAM



Fall 2011



GEOGRAPHY, GEOLOGY, METEOROLOGY, GIS

A LEADING AMERICAN UNIVERSITY WITH INTERNATIONAL REACH

The Annual Newsletter of the Department of Geography and Geology at Western Kentucky University

Dear Friends,

The Department of Geography and Geology enjoyed another extremely productive academic year in 2010-2011. Highlights of the year's accomplishments included the following events and activities:

- ▶ Chris Groves has been appointed a University Distinguished Professor in recognition of his teaching, research, and service accomplishments.
- ▶ Josh Durkee's annual summer "Field Methods in Weather Analysis and Forecasting" (severe storm chasing) class has been recognized with a "Creative and Innovative Program" award by the North American Association of Summer Sessions (NAASS).
- ▶ Geography and Geology students receive multiple awards at the annual Kentucky Academy of Science conference held at WKU.
- ▶ The Kentucky Mesonet reached 57 active stations, and captured record weather events across the Commonwealth (kymesonet.org).
- ▶ Geoscience graduate student Ben Miller has been awarded the top 2011 Young Karst Researcher Award from the International Association of Hydrogeologists, or IAH.
- ▶ Dr Rezaul Mahmood has been named to the prestigious National Climate Assessment Development and Advisory Committee.
- ▶ Two GIS students received ESRI scholarships, the tenth year in a row for the Department.
- ▶ Dr David J. Keeling was named to the interna-



A Letter from the Department Chair

tional editorial board of the *Journal of Transport Geography*.

- ▶ Seven geology majors studied the geology of Montana, South Dakota, and Wyoming during a six-week summer field course with Dr Andrew Wulff.
- ▶ Chris Groves will help to lead a new project titled IGCP 598: Environmental Change and Sustainability in Karst Systems under the auspices of the United Nations Educational Scientific and Cultural Organization (UNESCO) International Geoscience Program.
- ▶ Seventeen geography and geology majors 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 Hoffman Environmental Research Institute, the National Cave and Karst Research Institute (NCKRI) and the International Association of Hydrogeologists (IAH) hosted the 2011 International Conference on Karst Hydrogeology and Ecosystems June 8-10 at WKU, with scientists from 14 countries in attendance..
- ▶ 20 students (13 undergraduates) presented their research at the WKU Research Conference in March. Geoscience graduate student Josh Gilliland won the best paper award in the natural sciences, among several departmental awardees.
- ▶ WKU geology alumnus William Dost generously donated to WKU Libraries perpetual use of

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the databases of the American Association of Petroleum Geologists (AAPG).

Faculty and students excelled again in scholarship, research, and professional development, convening and/or participating in myriad professional workshops and presenting about 75 papers at local, regional, national, and international conferences. Faculty also engaged significantly with the local community, continuing to serve on committees and task forces, participating in WKU-sponsored community outreach events such as the *Far Away Places* series at Barnes and Noble, sharing geoscience expertise on WKYU-FM's Midday Edition program, and giving talks at schools, churches, community organizations, and for service groups.

Faculty served as editors or co-editors of professional academic journals or book series, seven faculty reviewed manuscripts for academic journals or publishers, and geography and geology faculty research articles appeared in such diverse journals as *FOCUS on Geography*, *Journal of Geoscience Education*, *Hydrological Processes*, *Journal of Latin American Geography*, and *Inorganic Chemistry*, among others. Approximately twentyfive faculty research articles or book chapters are either currently in review, revision, or awaiting publication, several co-authored with undergraduate or graduate students, an exceptional level of productivity indeed.

In May 2011, the Department recorded 125 majors in geography, meteorology, and GIS; 68 in geology; and 80 total minors. The Department graduated 36 students from its major programs during the year and it has a target of 50 new majors each year to maintain and grow the programs.

The students, staff, and faculty of the Department of Geography and Geology again have recorded many outstanding achievements this past year. We have each and every one of you to thank for helping to build the Department into what it has become--the best in the state and one of the very best in the nation. We look forward to hearing from you this coming year.

Best Wishes,
David J. Keeling
Department Head

*** HOMECOMING ***

Saturday, October 22, 2011

**** Special Event: Geography and Geology Departmental Tour (Including our GIS lab, MESONET, and Applied Research Centers).**

Time: 10:00 - 11:00am

Location: Meet on 3rd Floor EST Building

**** Special Event: Homecoming Tailgating**

Time: 11 a.m. - 2 p.m.

Location: DUC South Lawn - Join us at the

Geography and Geology Alumni Tent.

Enjoy good food and old friends. Meet the departmental faculty and current students.

Visit <http://www.wku.edu/geoweb/>

The Department website homepage is sporting a new look, following the university-wide revision of all website templates. There is fresh material, new links, updated pictures, and more information about programs. In addition, the Geology and GIS programs have developed their own websites with information about the major options, faculty research, student opportunities, and other information. GIS Director Kevin Cary and AMI Director Dr Aaron Celestian are the webmasters respectively and you can view pages at <http://www.wku.edu/gis/> and www.wku.edu/geology.

Archived information about the Department's news announcements (by month and by year) and other publicity can be found on the website at <http://www.wku.edu/geoweb/newsarchive.php>. There also are links to news reports archived by calendar year. Visitors to the website can also view details of faculty and student publications. Just go to <http://www.wku.edu/geoweb/facpubs.php> and you will find recent publications listed alphabetically by faculty, with a link to another page that lists faculty publications by rank. There is also a link to the student theses and other publications page, where you can see the breadth and depth of student research activities.

We love to receive updates from our alumni! Please take the time to fill out the alumni update form attached to this GEOGRAM or send the department head an email (david.keeling@wku.edu) with details.

Outstanding Geography and Geology Students, 2010-11

The Department of Geography and Geology takes pride every year in the quality of its graduating seniors and, each year, the Department recognizes its outstanding seniors at a public presentation by presenting them with awards and certificates. Recipients of the Department's highest honors also receive recognition at the annual Ogden College Awards Ceremony.

For the 2010-11 academic year, Ann Epperson received the Outstanding Geoscience Graduate Award, presented by Dr Katie Algeo. Ben Miller received the Outstanding Geoscience Graduate Award in the Physical Sciences. Matt Downen received the Judson Roy Griffin Outstanding Senior in Geology Award. Margaret Wilder received the Ronald R. Dilamarter Outstanding Senior in Geography Award. Sarah McCann received the second annual L. Michael Trapasso Outstanding Senior in Meteorology Award, presented by Dr. Josh Durkee. David Evans received the inaugural award for Outstanding Graduating Senior in GIS.



Dr Katie Algeo presents Ann Epperson with the Outstanding Geoscience Graduate Award at the Annual Ogden College Awards Ceremony, April 2011



Dr Josh Durkee presents Sarah McCann with the L. Michael Trapasso Outstanding Meteorology Student Award at the Annual Ogden College Awards Ceremony, April 2011



Dr David Keeling presents Matt Downen with the Judson Roy Griffin Outstanding Senior in Geology Award. at the Annual Ogden College Awards Ceremony, April 2011



David Evans receives the first annual Outstanding Senior in GIS Award from Kevin Cary

**Congratulations to ALL
our Outstanding Students!**



Geoscience Graduate Student Wins International Award

Ben Miller, who graduated from WKU in May 2011 with a Master's degree in Geoscience, has been awarded the top 2011 Young Karst Researcher Award by the International Association of Hydrogeologists, or IAH. Miller, who is from Springfield, MO, was recognized for his Master's thesis research studying the groundwater hydrology of the Carroll Cave System in Missouri. The award is typically given to doctorate-level students, but the committee this year felt Miller's research efforts were extraordinary at the Master's level.

The two other winners this year were Anita Eröss of Hungary's Eötvös Loránd University and Sarah Truebe from the University of Arizona. Each winner received a collection of books, but Miller also received a \$500 grand prize. Ben traced groundwater with geochemical and statistical methods to discover details of the geometry of a complex underground "plumbing system" that feeds a series of important springs.

Dr Chris Groves, director of WKU's Hoffman Environmental Research Institute, and Dr Bob Lerch of the U.S. Department of Agriculture's Agricultural Research Service, directed Miller's work. "Miller used



an innovative combination of cave exploration and mapping, water tracing, geochemistry and statistics," Groves said. "His learning curve as a Master's student was steep at times, even requiring extra classes, but he threw himself into it and, as a result, developed an outstanding skill set for this kind of environmental work."

Professor Nico Goldscheider of the University of Karlsruhe, Germany, the IAH Karst Commission chair and a committee member that selects award winners, said Miller was very talented and passionate about karst and caves. "Miller stood out in this competition because of his excellent presentation skills," Goldscheider noted. Miller is now an Environmental Research Specialist for WKU's Hoffman Institute.

"Ongoing research by students and faculty in the Hoffman Institute is addressing many of the critical challenges facing our global society in the 21st century, including water quality and environmental management of our natural resources," said Dr. David Keeling, head of WKU's Department of Geography and Geology.

Op-Eds About Issues of Importance to Society

By David J. Keeling

As a member of the American Geographical Society's Writers Circle, I continue to write commentaries about relevant social issues viewed from a geographer's perspective for publication in the local, regional, national, and international media. These Op-Eds have ranged from arguments about regional transport challenges (see below), about geopolitical issues, and about global climate change's impacts in the Arctic region. Part of the mission of the American Geographical Society (www.amergeog.org) is to stimulate debate on issues of importance to society and to highlight a geographic perspective on such issues. Scientists too frequently are accused of failing to engage with public policy in a meaningful way (witness ongoing debates over global climate change), so writing opinion pieces for local newspapers is one way to encourage a dialogue about important social and politi-

cal issues. Our hope is to encourage people to engage with these issues in their communities, thus helping to influence policies in a proactive way.

The following Op-Ed addresses the challenge of a failure by the United States to build new and to rehabilitate old infrastructure, and the likely challenges in the aftermath of a major natural disaster like last year's volcanic eruption in Iceland. This Op-Ed appeared in a number of newspapers around the country, including the *San Francisco Chronicle*.

LESSONS FROM EUROPE'S ASH DISRUPTION

With ash from Iceland's Eyjafjallajokull volcanic eruption causing havoc across European airspace, individual travelers and governments alike are turning to surface transport systems. Not since Sept. 11, 2001, has the airline industry faced such a catastrophic shutdown of regional and transoceanic flights.

With tens of thousands of air travelers stranded around the world, questions are being asked about vulnerabilities inherent in the global air transport system. Among them: How would the United States cope with a similar natural catastrophe?

Europe is fortunate to have a sophisticated network of ferries, high-speed trains and road transport to keep people and goods moving, however slowly. Despite overcrowding, capacity shortages, and poor planning and coordination of infrastructure, the negative impacts of a prolonged airspace shutdown within the region can be minimized. For example, Britain mobilized navy ships to help stranded passengers get back home. There was even talk of mobilizing cruise ships for transatlantic crossings should the circumstances require a more extended outage of air traffic.

However, if a similar air-traffic shutdown occurred in the United States, far fewer options are available to travelers. High-speed rail is nonexistent across the nation, and even the semi-fast Boston-Washington rail corridor is ill-prepared to cope with any significant increase in demand. Freeways and other roads are barely adequate to cope with existing traffic between major urban centers, and the resulting likely spike in gasoline demand from a major air-traffic disruption would ripple through the economy quickly. Prices would rise, supplies would contract, and deaths and

injuries on the roads likely would increase dramatically.

Unlike Europe, the United States has no forward-thinking, national, multimodal transportation plan and would be hard pressed to respond quickly and effectively to an air-traffic shutdown. If the government's response to Hurricane Katrina is any guide, chaos and crisis would follow a volcanic ash event in the U.S., with tremendous social and economic suffering.

No government can predict extraordinary natural disasters such as hurricanes, earthquakes and volcanic eruptions. Yet a basic understanding of accessibility and mobility issues would enable governments, emergency responders and others to have in place a strategy to cope with such an event.

As the Icelandic volcanic eruption has demonstrated, an unforeseen event can have serious economic and social consequences. This event also raises critical questions about globalization and the vulnerabilities inherent in having the world's major economic regions so inextricably intertwined.

Europe's experience with the ash disruptions on air travel should be a wake-up call for U.S. planners and policymakers. In an unprepared America, the fallout might be even more catastrophic.

Swedish Aid Agency Supporting WKU/United Nations Project

Last week in Paris, France, officials from the United Nations Educational, Scientific, and Cultural Organization (UNESCO) announced that the international project IGCP598: Environmental Change and Sustainability in Karst Systems, co-led by Dr. Chris Groves, University Distinguished Professor at WKU, will receive additional funding support from the Swedish Government for its capacity-building efforts. IGCP598 operates under the auspices of UNESCO's International Geoscience Program, with support from the International Union of Geological Sciences, and is an international effort to encourage high quality, basic and applied scientific research to advance the understanding of how environmental change over a variety of timescales impacts functions of karst systems, and where appropriate to inform sound decision making.

The project is the fourth in a series of karst-related environmental efforts under UNESCO's umbrella that WKU has participated in over the last 15 years. These have provided opportunities for numerous WKU students, faculty and staff to travel to conferences and field excursions in Vietnam, Greece, China, Switzerland, Croatia and several other countries.

The new funding comes from the Swedish International Development Cooperation Agency (SIDA) in recognition of IGCP598's capacity building activities, with related training activities planned here at WKU, in Slovenia and in China this year. According to SIDA, "your project has been selected, not only to achieve outstanding scientific goals but also to mentor leaders from targeted areas" including Africa, the Middle East and Iran.

"While these projects over the years have featured cooperation with scientists from these regions," said Dr Groves, who directs WKU's Hoffman Environmental Research Institute, "it's been pretty limited compared to Asia and Europe." The new funding will subsidize travel support for scientists from the targeted areas to travel to IGCP513 conferences and training activities.

"The Hoffman Institute's success over the years in developing the capacity of faculty and students to address these critical issues across the planet," said Geography and Geology Department Head Dr David Keeling, "has contributed to WKU's expanding international reach. This research helps to focus attention on strategies that contribute to improvements in the human condition."



Dr Josh Durkee

The Faculty, Staff, and Students Welcome the Department's Newest Faculty Member

Dr Leslie A. North joins the Department and Hoffman Environmental Research Institute as an Assistant Professor of Geography. Dr North recently earned her doctorate in Geography and Environmental Science and Policy from the University of South Florida in Tampa. Since she was first exposed to karst science as an undergraduate student, Leslie has focused her collegiate and research activities to understanding and protecting these fragile terrains. During her master's thesis research, which focused on evaluating anthropogenic karst disturbances, Leslie reached the startling conclusion that both the general public and policymakers have a very limited understanding of karst terrains, resulting in widespread misuse of these landscapes. As a result, for her dissertation Dr North conducted the first holistic study of karst-related educational programs implemented in the United States and abroad, and the tools, techniques, and feasibility of educating the general public at karst attractions, particularly show-cave facilities. Through a large body of data collected from over 100 show caves worldwide, she was able to illustrate the existence of multiple missed opportunities and misconceptions about educational pursuits in informal learning environments that are ultimately hindering the pursuit of appropriate geologic education and encouraging erroneous measures of program success.

Dr North has collected data from and/or conducted karst research at multiple international locations, such as in the Caribbean, Europe, China, and Canada. She is looking forward to continuing her international explorations while pursuing all of her research interests: water resources, anthropogenic karst disturbance, karst and water policy/management, show-cave and spring tourism, and informal science education. In upcoming academic years, Dr North will continue to work with the WKU Department of Engineering to research the effects of learning through the use of a cave simulator and the role of other common informal educational techniques on groundwater resource understanding, contribute to a multi-million dollar trilateral agreement, and analyze karst policies to examine how management and enforcement strategies differ both spatially and among representatives from the pri-

vate, governmental, and academic sectors. While at USF, Leslie served as President and Treasurer for the Karst Research Group and the Editorial Assistant and Cartographic Editor for the *Southeastern Geographer* journal. She has been an active member of the Association of American Geographers, National Speleological Society, Geological Society of America, Southeastern Division of the Association of American Geographers, and the National Cave and Karst Research Institute. She currently serves on the editorial board of *Southeastern Geographer*.

When she isn't teaching or conducting research, Leslie loves to travel, dance, scrapbook, spend time with friends and family, and to hang out and watch movies with her husband, Jason, and their five Chihuahuas (her girls). Leslie is looking forward to a wonderful and exciting year full of collaborative and interdisciplinary research projects, student engagement in research projects and classroom learning, and travel. Overall, although Dr North has firm roots in the state of Florida as a sixth generation born and raised Floridian, she has always enjoyed the changing seasons and cool weather, making the Kentucky karst region a perfect place to call home.



WKU Meteorology Student Wins Regional Weather Forecast Competition

WKU meteorology graduate 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 Josh Durkee's Synoptic Meteorology class to finish in the top 10 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 is aimed at helping students understand the theoretical and conceptual underpinnings of the day-to-day evolution of 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 take 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 have learned to generate) that boils down to a final forecast for high and low temperatures, precipitation, and winds for the next day.

WKU students finished in the top 10 of the following categories:

Overall: Mitchell Gaines of Versailles, first; Dustin Jordan of Seymour, Tenn., fourth; Kyle Berry of Mt. Washington, fifth; Andrew McKaughan of Tampa, Fla., eighth.

Temperature: Mitchell Gaines, second; Dustin Jordan, third; Andrew McKaughan, fourth, Kyle Berry, seventh.

Precipitation: Lee Campbell of Paducah, first; Mitchell Gaines, third; Dustin Jordan, sixth; Nathaniel Shearer of Berea, 10th.

"A number of students in the B.S. Meteorology program seek employment as professional forecasters," Dr Durkee said. "These types of applied learning exercises offer these students unique and excellent opportunities that can be quite advantageous toward their careers."

"The success of meteorology students in this contest, which puts them in competition with students from highly ranked programs around the country, speaks volumes about the quality of instruction and student engagement at WKU," Geography and Geology Department Head David Keeling said.

Drs Polk and North Attend China Environmental Justice Workshop

Two faculty from WKU's Department of Geography and Geology recently returned from southwestern China as invited lecturers in a workshop on environmental justice supported by a grant from the U.S. State Department to the Vermont Law School's U.S.-China Partnership in Environmental Law.

Expanding into new directions for WKU's China Environmental Health Project (CEHP), Jason Polk and Leslie North of the Hoffman Environmental Research Institute helped implement a two-day environmental workshop for local people and government officials to understand the workings of the Lingshui Spring water supply in southwest China's Guangxi Autonomous Region. Some 100,000 people rely on the spring as their sole water source.

The U.S. Environmental Protection Agency defines environmental justice as the "fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies." Conditions fall way short throughout the world, disproportionately for both rural and urban poor. In southwest China this particularly impacts indigenous minority nationalities such as the Zhuang people that dominate the area around Lingshui Spring.

The workshop, Training and Communication on Understanding and Protecting Groundwater in Wuming County, was organized by Guo Fang and Jiang Guanghui of the International Research Center on

Karst in Guilin. The goal of the workshop was to educate and engage local citizens and government leaders to understand and develop better water protection strategies to protect public health, particularly for the disadvantaged rural poor.



Dr. Jason Polk and Leslie North of WKU pose with Dr. Guo Fang from the IRCK (fifth from left), and officials from the Wuming County government political consultative, Guangxi Autonomous Region government, and the Chinese Geological Survey.

More than 200 people attended the workshop, including local citizens, Wuming County government leaders, members from the Wuming County political consultative conference, representatives of six county-level environmental and tourism bureaus, and graduate students from four Chinese universities. Dr Polk and Ms. North gave lectures on the intersections of karst and groundwater science, education, and policy, providing examples from the U.S. on research, informal learning strategies, public outreach, and U.S. policy and regulation implementation.

As an interesting historical note, local government leaders tasked relevant staff to go back through the historical records of Wuming County while preparing for the workshop, and it was determined that the event represented the most attention that the spring had generated for at least 1,000 years.

“China has become a key player in WKU’s internationalization strategies, and our department, through the Hoffman Institute, has developed meaningful and long-lasting research and teaching relationships with Chinese partners,” noted Dr David Keeling, Geography and Geology Department Head. “This visit to China by Dr. Polk and Ms. North builds on those im-

portant global relationships and opens up important new opportunities for research collaboration in the region.”

WKU Hosts International Karst Conference, June 8-10

Scientists from 14 countries attended the 2011 International Conference on Karst Hydrogeology and Ecosystems June 8-10 at WKU. WKU’s Hoffman Environmental Research Institute, the National Cave and Karst Research Institute (NCKRI) and the International Association of Hydrogeologists (IAH) hosted the meeting.

With its location on one of the world’s great karst landscapes and its history of karst scientific research, WKU has hosted a series of international karst conferences over the last several decades including the 8th International Congress of Speleology in 1981 and joint conferences of international karst commissions in 1998, 2003 and 2007. This year’s conference convened the annual 2011 business meetings of the International Association of Hydrogeologists Karst Commission, the International Union of Speleology (UIS) Speleogenesis Commission and the newly approved UNESCO/IUGS IGCP/SIDA Project 598: “Environmental Change and Sustainability in Karst Systems: Relations to Climate Change and Anthropogenic Activities.”

“We are very pleased to have hosted scientists from around the world at this meeting,” said Dr. Jason Polk of WKU’s Hoffman Environmental Research Institute, who lead the organizational activities. “With support from WKU’s Office of Research and Applied Research and Technology Program, WKU students were able to interact with top karst scientists from China, Brazil, Netherlands, Indonesia, Slovenia, and many other countries.”

The conference began on June 8 with technical presentations during the day at WKU followed by a welcome party that evening at Lost River Cave. On June 9, a series of field trips were conducted at the Mammoth Cave National Park area, followed by a cookout at the Hamilton Valley Field Station. Technical sessions resumed on June 10 at WKU with the conference concluding at a poster session and banquet at the Kentucky Museum.

Dr Ken Kuehn Retires

Dr Ken Kuehn entered into Transitional Retirement on July 1, making the 2010-11 academic year his last as a full-time faculty member with the Department. His new assignment is a half-time position as Head of the Department of Interdisciplinary Studies within University College. Interdisciplinary Studies is the fifth largest major on the WKU campus as well as one of its fastest growing.



Dr Kuehn receives his retirement award from President Gary Ransdell

Ken came to WKU in 1984 after holding professional positions with Penn State, the University of Tennessee-Chattanooga, and Shell Oil. He reports that his 27 years with the Department of Geography and Geology were very satisfying. The Geology programs have grown both in quality and quantity and are highly respected throughout the Commonwealth and

beyond. WKU has shown continued leadership in the Geology profession through its engagement with the Kentucky Society of Professional Geologists (KSPG) among many others organizations.

Ken served the University in a number of capacities during his career at WKU, including Geology Programs Coordinator (7 years), Assistant to the Dean for Planning (1 year), Interim Associate Dean (1 year), Faculty Associate with the Faculty Center for Excellence in Teaching (3.5 years), Faculty Fellow with Women's Studies (1 year) and Interim Department Head with Interdisciplinary Studies (1 year).

He also received numerous awards and recognitions from the University and beyond, including Outstanding Teaching, Ogden College, 1990; Distinguished Service Award, Kentucky Society of Professional Geologists (KSPG), 1997; Outstanding Public Service, Ogden College, 1999; University Distinguished Professor, 2002 to present; Distinguished Service Award, The Society for Organic Petrology (TSOP), 2004; and a Certificate of Appreciation from the Association of State Boards of Geology (ASBOG) in 2009.

Ken continues to serve as a member-at-large for ASBOG, a group that regulates the testing, ethics, and practice of professional geology in the United States. On campus, he is co-chair of the Education for Sustainability Steering Committee, which addresses the academic dimensions of sustainability initiatives at WKU.



Dr Kuehn with Ogden College Dean Blaine Ferrell



This past year Ken participated in the annual meetings of the Kentucky Society of Professional Geologists and the Kentucky Academy of Science. He completed two multi-year research projects with the National Park Service and was busy with significant professional development activities including travel to Canada, New York, Colorado and Scotland. On a personal note, Ken traveled to Hawai'i over the term break where he was married to Valerie Brown on January 1, 2011. He always looks forward to hearing from you and getting caught up on your latest news so stay in touch! You can continue to contact him through his WKU email or new phone, 270-745-7007

Dr Mahmood named to National Climate Assessment committee

Dr Rezaul Mahmood, professor of Geography and

Geology at WKU and associate director of the Kentucky Mesonet and Kentucky Climate Center, has been named to the National Climate Assessment Development and Advisory Committee.

Dr Mahmood attended his first committee meeting Aug. 16-18 in Washington, D.C. The committee of more than 60 scientists includes about 40 members from academic institutions, he said. "I consider this a professional honor not only for myself but for our department, Ogden College of Science and Engineering and Western Kentucky University," Dr Mahmood said. "I am honored to provide this important service to the nation."

The National Climate Assessment (NCA) is conducted under the auspices of the Global Change Research Act of 1990, which requires a report to the President and the Congress that evaluates, integrates and interprets the findings of the \$2.6 billion federal research program on global change every four years.

The next assessment is due in 2013, Dr. Mahmood said. National climate assessments act as a status re-

port on climate change science and impacts. They are based on observations made across the country and compare these observations to predictions from climate system models. The NCA aims to incorporate advances in the understanding of climate science into larger social, ecological, and policy systems, and with this provide integrated analyses of impacts and vulnerability.



Dr Rezaul Mahmood

Dr Keeling Lectures on an AGS Around the World Expedition.

Dr David Keeling, Geography and Geology Department Head and Professor of Geography, completed a three-week circumnavigation of the planet in February 2011, covering 36,000 miles, representing the American Geographical Society as part of its geographic educational outreach program.

The educational tour began in Peru, with a visit to the historic site of Machu Picchu, and continued on to Easter Island, where analysis of the Rapa Nui society's collapse in the 16th century continues to raise critical questions about resource loss and climate change impacts. Dr Keeling gave lectures on how relevant geography is for the 21st century and how global climate change is impacting peoples and places

in important ways.

Aboard a special expedition jet, the educational program continued on to Samoa, Australia's Great Barrier Reef, and the temples of Angkor Wat in Cambodia, where the impacts of global socio-economic change were experienced in the local cultures. Visits to the Taj Mahal in Agra and the Pink City of Jaipur in India focused attended on World Heritage site management and the challenges of over-visitation. Dr Keeling lectured on Nationalism and Identity in a Globalizing World and shed light on recent events in Pakistan, Egypt and Tunisia, as well as ongoing conflicts around the world involving territorial claims and ethnic tensions.

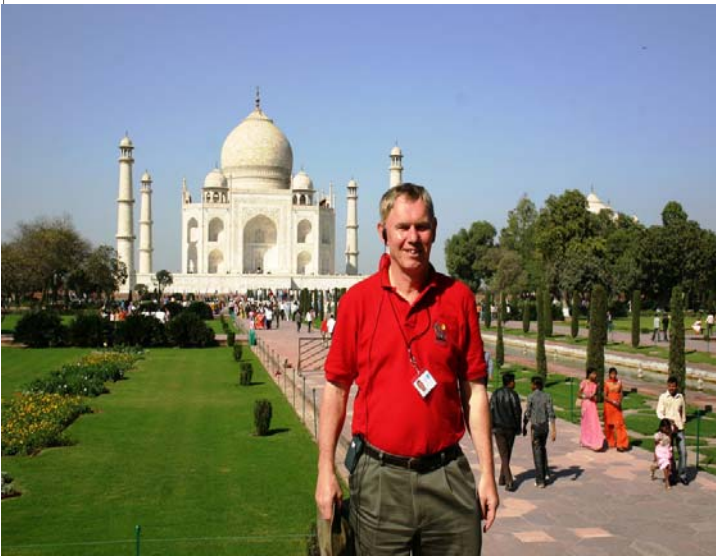
In Jordan, site of the ancient Nabatean city of Petra, he lectured on Oil, Water, and Islam, and discussed why the Middle East is trying to reinvent itself for the 21st century but is struggling to cope with changing global financial circumstances. Visits to the Serengeti Plain in Tanzania and to Fes, Morocco, focused attention on ecological issues. Dr Keeling gave a lecture on Exploration and Discovery and argued that we need to know more about the world around us if society is to overcome significant environmental, political and resource challenges. The expedition ended in Orlando, Florida.

The primary mission of the American Geographical Society's educational travel programs is to focus attention on some of the planet's most pressing problems, such as the social implications of climate change for small island communities, ongoing ethnic tensions in Asia, Africa and the Middle East, and the challenges for Islam in engaging with an increasingly Westernized global economy. A secondary mission is to demonstrate how geographers address these issues and to promote a broader geographic perspective on sustainable development issues.

"Learning about geopolitical conflict first-hand by examining, for example, Southwest Asia's changing economy within a global context really helps people to understand the issues of sustainability and global change and puts the challenges we face as a global society into sharper focus," Dr Keeling said.

One of the benefits for WKU, Dr Keeling said, is that the university's growing international reputation is further enhanced through his participation in these educational tours. Students also benefit from the knowledge gained from these experiences and subse

quently shared in the classroom and through research projects and study abroad programs.



Dr Keeling at the Taj Mahal in India

Past educational expeditions have led to successful departmental study abroad programs to Chile, Argentina, Tanzania, Turkey and Australia, among other destinations. Several friends and supporters of WKU participated in this around-the-world educational expedition, which served to solidify WKU’s reputation as a leading American university with international reach.

Climatologists Discuss Collaboration

Climatologists from Kentucky, Tennessee and West Virginia are exploring opportunities for collaboration in the development of climate services and research initiatives in the region. The group gathered recently for a meeting hosted by the Kentucky Climate Center at WKU. “This meeting was an effort to identify and develop opportunities to collaborate,” said Dr Stuart Foster, state climatologist and director of the Kentucky Climate Center and the Kentucky Mesonet.

In addition to Dr Foster, those participating in the meeting were: Dr Kevin Law, state climatologist at West Virginia State Climate Office located at Marshall University; Dr Mark Simpson, a geography professor at University of Tennessee-Martin; Dr Joanne

Logan, an environmental climatologist at University of Tennessee-Knoxville; Glen Conner, who served as Kentucky’s climatologist from 1978 (when the Kentucky Climate Center opened) until 2000; and Dr Rezaul Mahmood, associate director of the Kentucky Mesonet and Kentucky Climate Center.

“While we are neighbors, we have had little collaboration in the past. One reason is that NOAA has placed each state in a separate region. Kentucky is affiliated with the Midwest Regional Climate Center (RCC), Tennessee with the Southern RCC and West Virginia with the Northeast RCC.”

The three states are affected by many of the same climatic influences and share many of the same environmental and economic concerns, Dr Foster said. “We felt like we have enough in common that we could find ways to share resources in an effort to better serve our states, both in terms of delivering services and engaging in applied research,” he said.

Flash flooding is a common problem in the Appalachian region of each state; tornadoes are a concern in much of Kentucky and Tennessee; energy production and low rates for electric power help shape the traditional industrial economy of each state; and weather patterns can affect the market for electric power and the rates consumers pay.

“The three states have so much in common climatologically that it makes a lot of sense for us to collaborate together,” Dr Law said. “Our states are among the highest in weather related federally declared disaster areas. This shows the importance of having the most reliable weather and climate information available in our region.”

Dr Simpson, a Kentucky native and WKU graduate now living in northwest Tennessee, agreed that all three states would benefit from working together. “Since Kentucky and Tennessee share a very long border, it makes perfect sense to collaborate on projects together, and I can see many opportunities for doing so,” Dr Simpson said. “The inclusion of Kevin Law, state climatologist for West Virginia, into the discussions provided even more opportunities for the three states to work together, especially since there is the mutually shared interest of producing important research in Appalachian climatology.”

ADVENTURES IN GEOSCIENCE

Summer Field Geology Course

Upperclass geology majors again participated in a geology field course this past summer, along with students and faculty from Illinois State University, Northern Illinois University, University of Texas, Purdue University, Bloomberg University (PA), and Wittenburg College. Students Buddy Price, Whip Durall, Chris Driver, Matt Downen, Melanie Newton, Kelsey Kidd, and Courtney Elder studied the geology of South Dakota, Montana, and Wyoming for six weeks from May 15 through June 25. The top two grades for the entire field course went to Buddy Price and Melanie Newton as WKU was, once again, well represented. Both Buddy and Melanie have been nominated for USGS/ NAGT internships for next summer in recognition of their outstanding work!

Dr Andrew Wulff again taught the final three weeks, as the geology emphasized igneous and metamorphic terrains. The course, which is a capstone for geology B.S. majors at WKU, emphasizes field mapping techniques to develop geologic maps, construct geologic cross sections, and address some of the practical applications of these maps. Students also compose detailed rock descriptions, measure and construct stratigraphic sections, and write reports and abstracts of their work. Projects include mapping exercises in the Bighorn Mountains, Badlands, Black Hills, Whitewood Peak, and the Absaroka volcanics, which immerse students in a wide range of geologic structures, depositional environments, and rock types. Additional trips to Yellowstone Park, Devils Tower, various mining operations, and other areas of geologic interest were led by national experts, and extended the geological experiences, and built context for the projects. The weather this year was wetter than the past few years, including 6-8 foot snow drifts (in mid-June!!), and the usual late afternoon thunder and hail storms in South Dakota. The course was challenging as usual, but all agreed that it was an exceptional, fun, and intense experience. A new crop of field geologists is ready for their careers, armed with amazing but true field camp stories!

The Department has sent almost forty geology students to various field-based geology opportunities over the past eight years. These summer field courses, and an array of shorter field-based courses and experiences during the semester, are absolutely necessary for setting the field context for both coursework and for professional success. In fact, two students participated in summer REUs (see elsewhere) in part due to their field camp experience, as both returned to the Yellowstone area for their research. We surely appreciate the financial support of alumni that allows for such important experiences. Thank you!!



Geology students enjoying the summer!

Geology Majors REU Research

By Andrew Wulff

Two more undergraduate geology majors were involved this summer in nationally-competitive Research Experience for Undergraduate (REU) programs, funded primarily through the National Science Foundation. Melanie Newton (Cox's Creek, KY) worked with professors from Montana State University, LSU, and the University of Florida. Her project focused primarily on the magmatic history and field and temporal relationships of a variety of igneous rocks near Coulter Campground near Yellowstone National Park. The rocks exhibit a range of interesting (and enigmatic) textures associated with modes of emplacement and petrogenesis.



The entire 2011 field camp group,
including seven WKU students

These rocks and textures were then compared with the nearby Long Lake Complex to extend the possible petrogenetic models. Her work involved mapping and sample collecting in and around Yellowstone, working near Hellroaring Trail, Garnet Hill, Junction Butte, and Slough Creek in order to determine the relationships between the Archean basement rocks. A primary purpose was to gather data for zircon dating, geochemistry, and isotope and REE analysis in order to determine information such as age, source, and petrogenetic (fractional crystallization, assimilation, magma mixing) history in relation to other Archean bodies and the host rock. She also spent time processing samples at Montana State University, and doing more field work around Cooke City, Montana in order to compare their data to other igneous complexes in the region. Melanie is planning on presenting aspects of her research at several upcoming conferences.

Stuart Kenderes (Independence, KY) also worked on a project based in Wyoming, "Eocene Tectonic Evolution of the Teton-Absaroka Ranges, Wyoming," researching a variety of outstanding problems in the tectonic evolution of the Sevier-Laramide orogens as exposed in the Teton and Absaroka ranges in north-west Wyoming. The lead faculty on this project were Drs Dave Malone (Illinois State University) and John Craddock (Macalester College), who also received funding through the Keck Foundation. Stuart studied carbonate and igneous rocks of White Mountain and a possible ancient kimberlite eruption in the Sunlight Basin, with a special focus on determining the geochemical and temporal relationships of these rocks. After fieldwork was completed, Stuart spent time at Macalaster College preparing samples for complete geochemical analysis, and separating zircons from sediment samples for age determinations. The project also involved travel to the University of Arizona-Tucson in January for U/Pb analysis of the zircons and biotites to reconstruct paleogeography of the area. Stuart will be obtaining geochemical and mineralogical analyses using XRF, XRD, and Raman instru-

ments at WKU. He plans on presenting research at the annual conference of the Geological Society of America in Minneapolis and in the spring at the annual conference of the Keck Consortium.

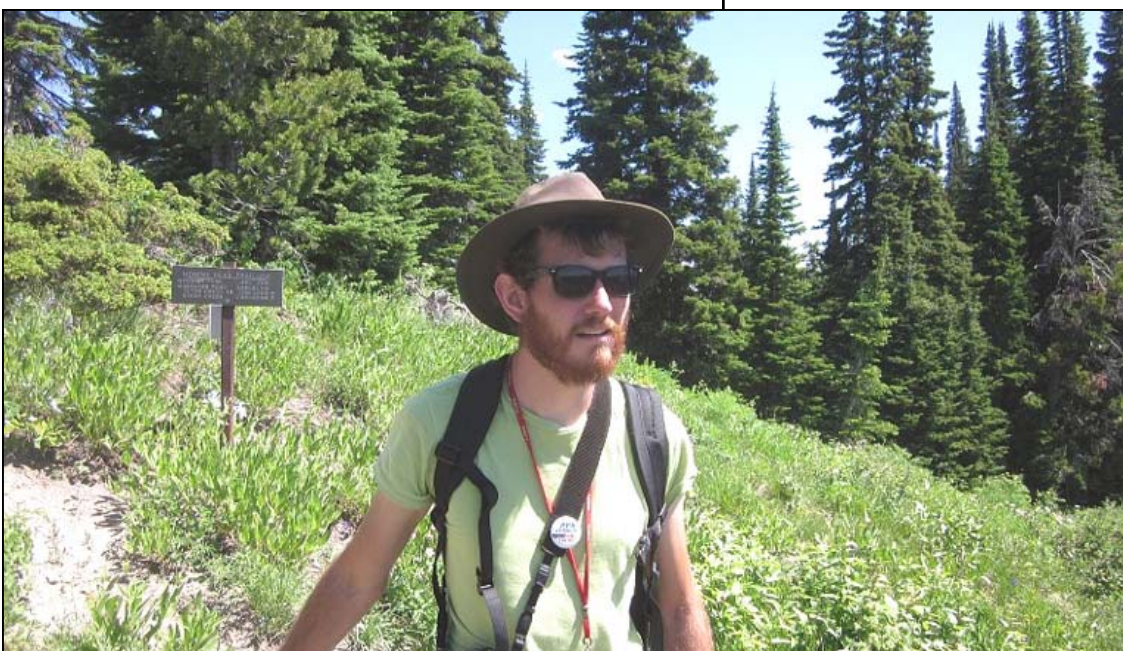
Both Melanie and Stuart will be continuing work on their research with Dr Andrew Wulff at WKU, and are now part of a growing body of WKU Geology REU veterans, numbering eleven in the past eight years. Other summer opportunities include working on- and off-campus in analytical labs, internships, and continuing research projects from prior semesters. Un-

dergraduate research has grown tremendously in large part due to the increased analytical capabilities in the department and courses with a focus on Analytical Techniques and Field Techniques.

You (and your companies) have a chance to be a part of this excitement!! Please contact the Department if you have internship or research or job possibilities. Financial support helps defray the costs associated with training and use of analytical instrumentation, making this training available for all students. Thank you!!



Melanie Newton
(photo by Andrew Wulff)



Stuart Kenderes (photo by Ben Kraushaar)

Royalty, Revolution and Rasputin: Adventures in St. Petersburg, Russia

Michael Trapasso

I hate cruise ships. But I boarded one this past summer. This particular cruise was scheduled to dock at or near the major capitals of the Baltic countries, including Copenhagen, Denmark; Berlin, Germany; Helsinki, Finland; Stockholm, Sweden; Tallinn, Estonia; and St. Petersburg, Russia. All of these cities possessed their own charm and their own stories, but it was St. Petersburg (a.k.a. Petrograd, and later Leningrad) that enticed me onto that over-priced floating casino. Of all the cities, this one struck me as the most interesting. For one thing, I did not realize how beautiful the city is! This was not a dismal, unadorned, utilitarian city one might expect from the former Union of Soviet Socialist Republics; this was the capital city of Imperial Russia. St. Petersburg was the home of the Tsars.

The city was founded by Peter the Great in 1706, on a stretch of swampy land often covered by 'a haunting mist', as the early inhabitants described it ... simple 'evaporation fog' as I would call it. Peter wanted his city to be an elegant showcase of Imperial Russia. He wanted the Tsar's palaces to rival the palace at Versailles. Peter demanded the architecture of his city be unparalleled by any European capital. He also constructed a series of canals to interconnect with the Neva River and create a "Venice of the North." He wanted his new city to attract not only nobles and aristocrats, but also scientists, artists, and writers from all over Russia and the civilized world.

Along one of St. Petersburg's many rivers/canals is Palace Row, where a string of magnificent palaces sit adjacent to each other in an astonishing display. I was amused by all the wedding parties preparing to take their album-photographs in front of these majestic backdrops. Of all the palaces of the aristocracy, I visited what I believe to be the three most interesting. *Catherine's Palace* near the town of Pushkin is named after Catherine the Great. This was the Tsar's country home (Figure 1). The place is so huge it makes the Biltmore Estate* appear the size of a garage. The architecture and artistic interiors are more lavish than anything Hollywood could conjure. Its grandeur is matched only by the *Winter Palace*, the Tsar's official

residence in St. Petersburg. The Winter Palace and its accompanying buildings and gardens make up what is called the Hermitage, now one of the world's largest and most prestigious art galleries, certainly second to none. My jaw-dropping experiences going through these incredibly lavish palaces of the Tsars left me dumbfounded. I couldn't believe the astonishing display of endless wealth.



Figure 1. One small section of Catherine's Palace. One of several Palaces of the Tsars, this one has a private church.

The astounding wealth of the ruling aristocracy would eventually be its downfall. As is sometimes the case in history, a fabulously wealthy ruler loses touch with the real-life problems of his people, especially the masses of impoverished. Tsar Nicholas II slowly lost his grip of power over the people. He made several disastrous decisions, which only enraged millions of Russian peasants. Against the advice of many, he insisted on a very unpopular war with Japan in a vain attempt to secure a warm-water port in the Far East. The Russo-Japanese War⁺ left many Russians dead and a population angry about their clueless ruler. Shortly thereafter came the fiasco known as "Bloody Sunday," when an estimated 120,000 Russians led by an Orthodox priest marched on the Winter Palace peacefully to petition for better living and working conditions. While carrying religious icons and singing "God Save the Tsar," the peaceful demonstration was halted by the army, which open fired on the crowd. Over 1,000 people were killed. And if those events weren't bad enough ... there was the Rasputin incident.

Of all the palaces, my favorite was veiled by a dark shadow. The infamous *Yusupov Palace* was the scene of a murder. This was the place where Grigory Rasputin was killed. Rasputin is a name most people associate with evil, but few know exactly why this is so. Rasputin was a Siberian peasant and a self-proclaimed monk. He was thought to be a mystic, a seer, and miracle worker. In reality, he was a con man, a drunkard, and a womanizer. But he had a tenacious grip on Tsar Nicholas II and his wife Alexandra. Nicholas viewed him as a visible connection between his position at the pinnacle of Russian society and the peasant masses who resented the lowest station in life. More importantly, the Tsarina Alexandra desperately wanted him close to the family. You see, the Romanovs had five children: four daughters (Anastasia being the most famous) and one son and heir apparent, Alexei. As misfortune would have it, junior was a hemophiliac, that is, a natural bleeder. Lacking the normal blood platelets and coagulants, the slightest cut or internal injury could leave the kid bleeding to death. Physicians of that day could do nothing, so a frantic mother turned to the mystics ... enter Rasputin (Figure 2). It was believed that the Monk had power over the boy's bleeding, and could help to make the effusion stop. That power, real or imagined, kept Rasputin close to the Imperial household and afforded him considerable influence over the Tsarina and her husband.



Figure 2. A figure of Rasputin in the room where his murder took place.

Aristocrats looked upon Rasputin's unholy bond with the Tsar as a dangerous political situation. Thus it was decided to eliminate the "Devil Monk" perma-

nently. In 1916, a group of noble elites, including one of the Grand Dukes, led by the fabulously wealthy Prince, Felix Yusupov, decided to kill Rasputin, as they perceived him as a threat to their power. On the night of 16-17 December, they invited Rasputin to the Yusupov Palace for tea and cakes. As a peasant, he was not allowed through the front door like respectable folk, so he entered quietly and unobserved through a servant's entrance. He was not allowed upstairs, as polite company would be, so he was entertained in the Palace basement. The rooms in the basement were very nicely decorated and looked quite cozy. (I think most of us would have partied down there; after all, it was the basement of a palace!)

Thus the murder scene was set. They fed Rasputin cakes laced with poison...but he didn't die. So they fed him more poison cake, and he still didn't die. Sensing he was in danger, Rasputin tried to escape. He was shot, twice, but still didn't die! As he struggled to get away, he was stabbed several times, but he still didn't die!! In a backstreet, they bludgeoned him with a club and threw his body, still kicking, into the freezing Moyka River...then he died. I had read an account of that murder years ago and had forgotten that Rasputin's death was about as mysterious as his life. Going through those subterranean passages and rooms where the murder was staged brought this strange tale to life. The Yusupov Palace, smaller than the Tsar's palaces, was still unbelievably beautiful, with stupendously decorated rooms and hallways, one more lavish than the last; I think my favorite was the Yusupov's private theater, complete with stage (of course), a large seating capacity, balcony, and box seats.

Later that day at dinner, a young couple was overheard discussing the outrageous wealth they had witnessed in the palaces of St. Petersburg. The young lady turned to her husband and said: "No wonder those peasants were so pissed-off!" And pissed-off they were, for on the night of 24-25 October, 1917, the naval cruiser *Aurora*, docked at St. Petersburg, fired a shot signaling the attack on the Winter Palace. The Bolshevik (Communist) Revolution had begun.

* Biltmore was constructed by George Washington Vanderbilt II outside Asheville, North Carolina, and is considered one of America's palaces.

+ The Russo-Japanese War ended in 1905, and it was none other than President Theodore Roosevelt who brokered the treaty. For his part, Teddy was awarded the Nobel Peace Prize in 1906.

Discovering China

By Margaret Crowder

What did I do on my summer vacation? This summer, along with 42 other individuals from the WKU campus and community, I was fortunate to travel to Beijing to take part in the Summer Camp of Chinese Language and Culture through the Confucius Institute at WKU. The camp was a three-week experience with classes, field trips, friendship, and adventure! Prior to this trip to China, my international experiences were limited to Canada, Mexico, the Bahamas, and the Cayman Islands. Needless to say, the time spent in China broadened my world views greatly while, at the same time, reminding me that it is, indeed, a small world after all.

Once in Beijing, our group was met by faculty and students from our host university for the trip, the Beijing campus of North China Electric Power University (NCEPU). Our hosts were all so helpful and nice! Two of the graduate students who met us that night were Xu Llingfei (Leonard) and He Siqi (Katie). Through my conversations with them, I learned that they credit their English skills to watching hours of English television (Friends and Grey's Anatomy were favorites of Katie, while Leonard preferred BBC television and, as a result, spoke with a British accent). I also learned that they are exactly like many graduate students in the United States – they work hard, are worried about what they will do when they graduate, and they are concerned with maintaining their friendships, family, and personal relationships.

Our meals while in China varied greatly. Many meals were eaten in the NCEPU student cafeteria, where we had the option of rice for any and all meals, and I consumed many eggs, vegetables, and different shapes of fried bread. I learned that chopsticks *can* pick up a boiled egg and that they can't (well, I can't) pick up large rolls on a consistent basis (handy things, fingers!). Meals away from campus consisted of a wide variety of foods, from Mongolian barbeque to Peking duck. We also experienced numerous types of teas and even some different beers and wines (ganbei!). Most of our restaurant meals involved a table with a large lazy susan laden with more dishes

than it could hold. The lazy susan is certainly much easier than passing dishes back and forth around the table. I wonder why this hasn't caught on in the U.S.? "Spin the potatoes, please!"

While at the university, we attended classes on a number of subjects, including Chinese language, traditional festivals, medicine, dance, Qigong, Taiji, arts and crafts, and calligraphy. We had wonderful teachers who were quite patient with us, especially as some of us failed miserably in our attempts (I still can't pronounce the differences between ji, qi, and xi, am pitiful with tone, and let's not even talk about traditional dance!). Our teachers and hosts were complimentary of our group's performance of a Chinese song, however, so maybe we weren't that hopeless (although I think they were being kind....).



Margaret Crowder at the Great Wall
It is steeper than you think!

We took many wonderful field trips in and around Beijing and Baoding. We were able to see the Confucius Institute headquarters, Tiananmen Square, the Forbidden City, the Heavenly Temple, the Summer Palace, the Olympic Stadium and National Aquatics Center (Bird's Nest and Water Cube), Baiyangdian Lake, a school for Chinese martial arts, and the Great Wall. The tourists at these locations were largely Chinese, and we were told by our guides that the numbers of native visitors have increased as individuals have more money to spend on travel. My favorite location was the Great Wall, as it is a place I have always

wanted to see. We went to the Badaling section of the Wall, which is the most visited. Fortunately, this section has been much restored with important features like handrails, as several portions of the Wall are extremely steep. One of the things I noticed while climbing the Wall was that both children and adults carried snacks with them of fruit and vegetables. Corn on the cob was a popular item. What a wonderful and healthy snack option!



The Bird's Nest, as seen through heavy smog

Unfortunately, the air quality in Beijing was quite the opposite from healthy. There were only a handful of "blue sky days" in which we experienced sunshine that produced shadows on the ground. Most days looked overcast, even when there were no clouds in the sky. The sun was a hazy orb. The day we visited the Bird's Nest and the Water Cube, the Air Quality Index (AQI) was near 400. The AQI measures air pollution levels, with 0-50 considered good, 51-100 moderate, 101-150 unhealthy for sensitive groups, 151-200 unhealthy, 201-300 very unhealthy, and 301-500 hazardous, as outlined by the Environmental Protection Agency. On this day in Beijing, it was difficult to see buildings right across the road from you. Picture a thick fog, only the fog is air pollution. I have mild asthma, which is almost completely controlled at home with minor medication use. After a little over two weeks in Beijing, I began to experience some severe respiratory problems. Although I know, academically, what pollution does to our environment, this was a real and

personal (and frightening) experience with how a lack of environmental controls affects the planet. From a scientific perspective, the pollution was physical evidence of what we can learn from other regions. Beijing may be on the other side of the globe, but its atmosphere is our atmosphere. It's a small world and we only have one.

From a cultural perspective, the people I met in China were flesh and blood evidence of why we should all have international experience: as a reminder that people are the same, no matter where you go. We have the same struggles and the same concerns. We share laughter, we share pain, and we share love for one another. It made me wonder (not for the first time, and I'm sure not for the last) why we can't live in harmony. Is it because of the ignorance we have of each other that we manifest and maintain hatred?

I learned a great deal from my trip to China. I am grateful to have had the experience and hope to have more international travel opportunities. Through international travel we can learn so much, not only about our neighbors but also about ourselves.



WKU Confucius Institute trip group picture at the Temple of Heaven.

NEW SUPERCOMPUTER INSTALLED

The computing power available in the Department is getting supersized at the High Performance Computing Center. “The installation of the High Performance Computing Center and the Lost River Data Center in the WKU Center for Research and Development adds significantly to the value of this facility to the region and the state,” said Doug Rohrer, Associate Vice President for Research and Development at WKU and Executive Director of the Central Region Innovation and Commercialization Center. “Along with the resources of the other facilities located here, we can offer a powerful combination of research and data support tools to WKU, other universities and industries around the country.”

WKU’s Ogden College of Science and Engineering received \$2.379 million in 2009 from the U.S. Department of Education for the project. WKU provided an additional \$50,000. Earlier this month, representatives of PSCC Labs of Lake Forest, CA, delivered and installed the nine racks of processors and other equipment that include 3,256 physical Intel cores, 3,256 virtual cores and 7,168 nvidia Tesla GPU cores providing a maximum performance of 55 terra flops. What’s that mean? “If you compare this computer to your laptop, this has about 7,000 times more computing power,” said Dr Claire Rinehart, biology professor and director of Bioinformatics and Information Science Center.

The supercomputer’s power, data storage, and network connectivity will enable WKU faculty, staff, and students to conduct research projects that may have taken months of computing to complete on campus or that may have been conducted off site at other research facilities. Dr Rinehart and Dr Rezaul Mahmood, professor in the Department of Geography and Geology and associate director of the Kentucky Mesonet and Kentucky Climate Center, serve as co-directors of the HPCC and have been working on the project for several years.

The HPCC’s mission is to support research and economic development, support WKU’s educational mission, develop a competitive workforce by training students on the latest technology, build intellectual capital by attracting and retaining faculty and staff, and foster public-private collaborations

(including a partnership with Bowling Green Municipal Utilities at the Lost River Data Center). Ogden College has utilized a smaller computing system for research projects, “but many of the departments needed this additional capacity,” Dr Rinehart said.

The Kentucky Mesonet has been one of the driving forces in developing the HPCC, Dr Mahmood said. The Mesonet collects real-time weather and climate data from a statewide network of stations and provides that information online. However, Dr Mahmood said WKU’s weather and climate researchers need additional computing power to use Mesonet data to produce experimental weather forecasts for Kentucky. “Many of our weather and climate experiments cannot be done without this kind of supercomputing facility,” Dr Mahmood said. “This type of infrastructure is critical and this kind of computational power enables us to do additional types of research.”

Among other research areas that will benefit from the supercomputer are chemistry, physics, astronomy, wound healing, ecological modeling, bioinformatics, biology, DNA sequencing and molecular biology. The HPCC also has been designed with “green” technology and uses a software management system to reduce power consumption, Dr Rinehart said. “From the beginning we were interested in developing the center to take advantage of high capacity but use less power,” he said.



Dr. Claire Rinehart, (left) co-director of WKU's High Performance Computing Center, and Tony Perrella of PSCC Labs in Lake Forest, Calif., move one of the units during installation of a supercomputer at the Center for Research and Development. (WKU photo by Clinton Lewis)

FACULTY ACTIVITIES

KATIE ALGEO continues to be engrossed with research on the cultural geography of Mammoth Cave. A major focus this year was the Mammoth Cave Historical GIS. A book chapter outlining the project, "Remembering Rural Community: Historical GIS for Mammoth Cave National Park," appeared in *Geographical Perspectives on Sustainable Rural Change*, edited by Dick Winchell (2010), and an article co-authored with graduate students Ann Epperson and Matt Brunt, both of whom developed portions of the historical GIS as part of their Master's theses, will appear shortly in the *International Journal of Applied Geospatial Research*. Katie was excited to offer, for the first time this Spring, a course in historical GIS, and the undergraduates who were part of this course made significant contributions to the Mammoth Cave Historical GIS. On a slightly different topic, but still related to Mammoth Cave, Katie's article "Underground Tourists/Tourists Underground: The Bransford Hotel and African-American Tourism to Mammoth Cave" will be forthcoming in a special issue of *Tourism Geographies* focused on African American tourism.

Katie was elected this year to the Nominating Committee of the Association of American Geographers, a committee charged with soliciting nominations (and sometimes coaxing candidates to run) for leadership positions within the AAG. She also started a term on the Board of Directors of the Pioneer America Society, an interdisciplinary organization dedicated to the study and preservation of material culture and historic landscapes, and she continues to serve, as she has for the past few years, on the Board of Friends of Dumont Hill, a volunteer group in Scottsville, KY, charged with preservation and interpretation the Civil War encampment site at Dumont Hill. That group is moving into the next phase of walking trail development by creating interpretive signage to highlight the history and geography of the park.

This summer Katie travelled to Manitoba, Canada, for the Quadrennial International Rural Geography meeting and continued her informal and peripatetic investigations into food geography by eating at a Tim

Horton's, taking photos of endless fields of canola, and sampling the street food at the Winnipeg Fringe Festival.

JOHN ALL writes that this past year has been excellent in many ways. After spending the previous year in Nepal teaching on a Senior Fulbright Fellowship, this year John gratefully enjoyed the delights of being home – hot showers, any food he wanted, and central heat and air! During the year, Dr All taught his normal load of Environmental Law, Resource Management, Remote Sensing, Environmental Planning, Biogeography, and World Regional Geography. Additionally, he worked with numerous students on independent research projects using the data collected in Nepal to study everything from the impacts of climate change on vegetation to the effect that the Maoist Civil War in Nepal had on the National Parks and Protected Areas in the Himalayas. Several published papers should result from these research projects during the coming year. Also this year, Dr All had three entries published in the SAGE Encyclopedia of Geography (Adaptation to Climate Change, Global Environmental Change, and Symptoms and Effects of Climate Change) and he published a piece on Climate Change in the Central Himalayas of Nepal.

While most of his recent work focused on Nepal, Dr All was also a team leader for the Cordillera Blanca Environmental Expedition in Peru this summer. He worked with the American Alpine Club and the Government of Peru examining air quality and various other environmental parameters in the high Andes. During this expedition, Dr All and Dave Truncellito completed potentially the first ever traverse of Artesonraju in Peru. Artesonraju is the mountain featured in the Paramount Pictures logo and is said to be the most famous mountain on earth because more people have seen a picture of it than any other. This traverse (climbing the north ridge and descending the southeast face) was made doubly difficult thanks to climate-change deterioration on the glacier. Huge crevasses and major avalanche zones had to be crossed successfully over a 20-hour straight final summit climb to survive the traverse. All and Truncellito had to emergency bivvy without sleeping bags or shelter on the glacier in temperatures well below zero because the climb's conditions had been

so harsh and thus movement slowed. Fortunately, the frostbite Dr All suffered was not severe and his toes and fingers are almost back to normal. Dr All sampled snow on both the north and south sides of the mountain and carried over six gallons of snow (40 lbs) during the climb in addition to his normal 30 lbs of ice climbing gear. This snow is currently being analyzed at the University of Colorado, Boulder (NCAR). The experience has opened up a wealth of new collaborative opportunities with universities and agencies in Peru and several geography students are already examining the Peru data as part of independent study projects. Clinton Lewis – the WKU photographer – participated in the expedition and should be publishing a story and photographs on the trip in the next set of alumni publications.

KEVIN CARY writes that another exciting year ended with the Department's first GIScience graduate! David Evans is our first GIScience major graduate and he was gainfully employed two weeks after graduation with a GIS firm working out of Ft. Knox, KY. This past summer, three of our GIScience majors worked as GIS interns for WKU's Planning, Design, and Construction department (PDC), digitizing and updating recently received planimetrics for campus using ArcGIS Desktop, and Trimble GPS units. They are now employed as PDC student-staff and are very much enjoying their new position and the birth of their new careers in GIS as they continue to finish their GIScience major.

This past academic year, two of our GIScience students were awarded student assistantships for the ESRI GIS Conference in San Diego. While at the conference this past July, one of our students received great interest from ESRI about being hired as one of their technical support analysts! Kevin was in San Diego too, and received the news about the job offer to his student on the second day of the conference! Kevin delivered a presentation at the ESRI Conference about using ArcGIS Desktop in a statistics class (the Department's Data Analysis and Interpretation class, GEOG 391). His presentation



received great interest and the moderator of his session (along with others in attendance) said that they wish they had GIS in their stats class as an undergrad! Kevin is still a GISP reviewer with GISCI (<http://www.gisci.org>) and he encourages everybody who has at least four years of on-the-job GIS experience to apply for their GISP credential! There are over 4,800 GISPs worldwide and this number is growing! GIS is gaining more and more popularity throughout the WKU community and it's opening a new suite of Internet GIS and Database GIS applications for Kevin, as well as opportunities for our GIScience majors as GIS interns! It's going to be another exciting year for him and he's looking forward to it!

AARON CELESTIAN enjoyed another fast paced and ever-changing year as director of the Advanced Materials Institute. The Institute is really starting to grow, and with the newly built analytical laboratory at the Center for Research and Development, it should start to draw in more academic and industrial users from across the region. After the completion of the new lab in October, WKU will truly have the most cutting edge analytical instrumentation in the region. Students directly benefit from this as the AMI employs both geology majors and chemistry majors to work side-by-side on similar problems. Classes such as Advanced Analytical Techniques, Mineralogy, Crystallography, and Optical Mineralogy make extensive use of the analytical capabilities to keep WKU geology majors at the forefront of research, technology, and education.

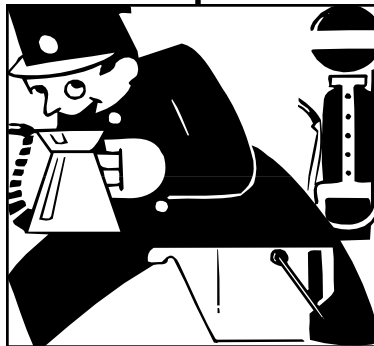
In addition, Dr Celestian continues to be a productive researcher and contributor to global geoscience. He has published several articles recently and has several more manuscripts in preparation, or submitted, that are co-authored by students working in his labs. Some of the funded research that they perform aids the petroleum industry by characterizing and developing new minerals for enhanced fluid catalytic cracking for use during the crude oil refinement process. He has decided to continue being an Associate Editor of the

international journal *American Mineralogist*, and he also serves on the Science Review Panel for neutron research at Oak Ridge National Laboratory.

MARGARET CROWDER this year visited the palace of a king. That's right...she went 300 miles to Graceland! Oh, and she went to China and saw some pretty cool stuff there, too. Summary: Graceland has more sparkly jumpsuits. When not experiencing various moments of cultural enlightenment and fashion transcendence, Margaret found time to teach classes in geology ("Raised on Rock"), take classes in educational leadership, and work on a practicum with the OCSE Dean's Office ("Big Boss Man"). She is in the final year and a half of her Ed.D. journey ("Follow that Dream") and hopes to have coursework completed in spring 2012 so she can work towards dissertation completion ("Promised Land").

Over the summer, Margaret, along with her two SKyTeach assistants (Crystal Smith and Jordan Danridge), taught Geology in the Movies for the WKU Center for Gifted Studies' Summer Camp for Academically Talented Middle School Students, in which students learned about the facts and fiction of science portrayed by Hollywood while creating their very own short movies. Margaret also led a session this summer on volcanoes for the Women's Studies Program's Women and Kids Learning Together Summer Camp. Margaret continues to be involved in geoscience education and outreach and gender issues in the STEM disciplines. She is a part of a team of investigators from WKU awarded an NSF Division of Undergraduate Education grant in fall 2010. Work on this grant will continue over the next two years, with the goal of enhancing effective teaching strategies in introductory science laboratory courses.

Margaret's world is wonderful, productive, crazy, "All Shook Up," and she sends you a mental "Good Luck Charm" to make your coming year fit for a king! And Elvis has left the building... ☺



SCOTT DOBLER notes that over the last ten years he has worked with many students and faculty members in Geography and Geology. As an instructor in the department, Scott has been tasked with teaching a wide verity of physical and cultural general education classes, as well as upper-level skill-based courses. To date, he has been involved with 15 separate course offerings.

His research interests in the Department have focused on geography education. Scott is a co-coordinator of the Kentucky Geographic Alliance (KGA), which first began with Drs Albert Petersen and Wayne Hoffman in our Department in the mid 1980s. His partner is Dr Kay Gandy in the Department of Education, and together they work at the local, state, and national level to promote geographic education. Scott has personally traveled to Washington, DC, three times to lobby congress to include geography in the No Child Left Behind (NCLB) Act. Geography is the only nationally recognized content area that is not currently funded by NCLB.

During the current economic crises and legislative hoopla, continued financial support for the Alliance Network by National Geographic has waned. The NGS has continued to provide guidance about finding additional revenue sources and support by helping alliances implement a formal strategic planning process. With funds from National Geographic, the KGA has developed an Atlas of Kentucky that is designed for the K-12 market, and the KGA will soon be searching for sponsorships for printing and shipping of the product. This initiative, among others, is the centerpiece of the KGA's strategic planning process. Scott and Kay plan to use the proceeds to continue geographic advocacy in the state. If this is an interest of any alumni out there (individuals or businesses), please do not hesitate to become financially involved!

Scott is also involved with the Kentucky Mesonet in the state. His position with the Mesonet is associated with education outreach, and he has provided a number of training activities for teachers that are interested in using the Mesonet data in their classrooms. A number of teachers have developed

lesson plans and these have been posted on the Mesonet website (kymesonet.org).

Scott is also the committee chairperson of the Kentucky Geographic Names Committee (KGNC). The committee is made up of professionals that have an interest in the standardization of the names of geographic features used in the Commonwealth of Kentucky. Members represent local interest in regards to name changes and new names to the United States Board on Geographic Names (USBGN), which is responsible for maintaining the Geographic Names Information System (GNIS). The Board is currently reorganizing the committee in order to establish a formal mission, and to standardize the policies and procedures for future activities and membership. The outcomes of this process will be used to represent more efficiently local interests to the USBGN, and to generate support for general geographic awareness for the citizenry at large.

JOSH DURKEE writes that in his third year he taught a new section of Synoptic Meteorology (GEOG 432), as well Introduction to the Physical Environment, Meteorology, and Mesoscale Meteorology (GEOG 100, 121, and 437, respectively). His students in GEOG 432 and 437 competed in the national forecasting competition, WxChallenge, which hosts close to 2,500 forecasters that range in skill up to the professional level. In another regional, multi-university forecast contest, Josh's GEOG 437 students brought home first place in the precipitation category, and first place overall. Josh's new field-based course, "Field Methods in Weather Analysis and Forecasting," was nominated for two awards, and won the North American Association of Summer Sessions creativity and innovation award. This year, the group traveled nearly 7,300 miles across 12 states, and successfully predicted and tracked numerous severe storms with tornadic circulations, including the EF-5 Joplin, MO, tornado (the most deadly on record). Needless to say, he is already gearing up with excitement and anticipation for yet another successful severe-storms forecasting class next spring. Additionally, Josh was actively involved in



various activities including the Meteorology Club, WKU Storm Spotter Network, the Science Olympiad, and a severe weather workshop at the Cumberland Trace Elementary School here in Bowling Green, KY.

In terms of research activity, Josh published two invited articles (*Geography Compass* and *Earthzine*) that discussed the nature of non-convective high-wind events in the U.S. Josh also published an article in *Journal of Geoscience Education* that describes new approaches to teaching severe weather forecasting in college-level introductory meteorology courses. Furthermore, two manuscripts have been accepted for publication in *National Weather Digest* and *Bulletin of the American Meteorological Society*. The former is a diagnostic case-study analysis of a particularly complex non-convective high-wind event over the Great Lakes region in 2003, while the latter is an analysis of the synergy of the various atmospheric processes that helped produced the record rain and flood event over the Mid-South during May 1-2, 2010. This second paper is a collaborative effort with three undergraduate students from the meteorology program and the meteorology faculty.

Aside from his own research endeavors, Josh has collaborated with a number of undergraduate and Garton Academy students that resulted in 23 professional conference presentations at the national, regional, and local levels. Further, Josh is collaborating with other faculty within Ogden College on a National Science Foundation-funded effort that involves undergraduate researchers from around the country to study various aspects of the Green River Watershed in KY. With the second year of the REU program completed, two of his researchers are slated to attend two regional and national conferences to present findings from their research on thunderstorm activity over the basin. Following these conferences, Josh wishes to submit the work for peer review.

XINGANG FAN continued to teach GEOG 121 Meteorology over the past year and his teaching effectiveness has been much improved.

Students are motivated and interested in the class project and forecasting contest. Besides, Dr. Fan successfully offered a GEOG 439/539 Atmospheric Modeling course in spring 2011. In this modeling class, students learned the basic concepts of numerical weather modeling, components of a numerical model, and procedures of carrying out a numerical simulation. In addition to the theoretical basics, students gained hands-on experience with running a state-of-the-art regional weather model on a high-performance Linux cluster, which Dr. Fan has acquired and setup with the support from his startup and new faculty scholarship funds. With this facility, students were able to practice on a Linux operating system with Fortran programming. They carried out a class research project, which included model setup, data processing, experiment design, output analysis, and visualization, but most importantly they wrote research papers in a publishable format. This course strengthens our meteorology program by providing students the opportunity to grasp this basic and powerful tool in weather and climate studies. This also prepares our students with modeling skills for future workforce and professional research. The course is planned to be offered again in fall 2012.

Besides teaching, Dr. Fan continued working on his NASA grant dealing with climate downscaling and impact studies. He supervised a visiting Chinese student, Liang Chen, who worked on his Ph.D. dissertation. The research work he conducted here at our department has been a major part of his dissertation, which he successfully defended this past June, earning his Ph.D. degree. This research has generated a 30-year, high-resolution climate dataset for the CONUS region at a 30-km resolution and for the southeastern US at a 10-km resolution. Research results were presented at international and national conferences and submitted to journals.

While working on the ongoing research project, Dr. Fan is actively engaged in proposal writing and seeking collaborative studies. Dr. Fan hosted Dr. Zhuguo Ma, a visiting scholar from the Institute of Atmospheric Physics, Chinese Academy of

Sciences, for a short visit in summer 2011 to discuss potential collaborations in the area of regional climate change study. A preliminary research plan has been formed and they are developing a new proposal collaboratively. They hope that this will enhance our international collaborations.

STUART FOSTER traversed Kentucky from the heights of Black Mountain, the highest point in Kentucky, to Monkey's Eyebrow, a few miles from the confluence of the Ohio and Mississippi Rivers. His time outside the classroom continues to be focused on helping to build and sustain the Kentucky Mesonet. In addition to helping create local partnerships to add new



observing sites to the weather and climate monitoring network, he gave presentations high-lighting the Mesonet to a variety of groups, including the Kentucky Municipal Utility Association, the Kentucky Rural Water Association, and the Kentucky Renewable Energy Consortium. He also gave presentations at the Kentucky

Weather Workshop and the Middle Tennessee Severe Weather Workshop.

Dr Foster also gave numerous media interviews during the year. "It was a year of weather and climate extremes, with record rainfall and flooding in May, followed by intense heat and an agricultural drought in portions of the state by late summer," he commented. "These types of events have real impacts for people and communities, so there is quite a bit of interest in the media, particularly with a growing public awareness of climate."

The summer months offered Dr Foster an opportunity to participate in national meetings and workshops. In June, he was a participant in a workshop in Chicago sponsored by the National Integrated Drought Information System. Dr Foster commented that, on his return trip to Bowling Green, he had a unique experience of driving through a wind farm during a thunderstorm with an intense display of cloud-to-ground lightning strikes in the midst of a landscape of wind turbines. Later

in the summer, Dr Foster attended the Conference on Applied Climatology and the annual meeting of the American Association of State Climatologists (AASC) held jointly in Asheville, North Carolina. At the AASC meeting, Dr Foster was voted by his fellow state climatologists to serve this year as president-elect for the national association.

GREG GOODRICH writes that the 2010-11 academic year brought about a return of normalcy to his life. Even though he stayed home a couple of days a week to watch Miles and Camden, he was able to get his research back on track. Dr Goodrich published five articles in 2010-11 and submitted three others, all in peer-reviewed journals. Balling and Goodrich (2010) investigated drought trends and was published in *Physical Geography*. Balling and Goodrich (2011a) reported on global patterns of spatial autocorrelation that appeared in *Theoretical and Applied Climatology*. Balling and Goodrich (2011b) was an article on trends in precipitation intensity in the United States that was also published in *Theoretical and Applied Climatology*. Goodrich et al. (2011), co-authored with three students (recent M.S. Geoscience graduate Kyle Thompson and recent B.S. Geography graduates Kylie Batson and Stanley Wingard), was an outcome of his summer faculty scholarship from 2010. The research investigated the 2007 summer drought in Kentucky and Tennessee and was published in the *Southeastern Geographer*. Finally, Leeper et al. (2010) was an article with two student co-authors (recent M.S. Geoscience graduates Ronnie Leeper and John Walker) published in the *Journal of the Kentucky Academy of Science*. This article focused on teleconnective impacts on major Kentucky snowstorms.

Other articles that were submitted included Durkee et al. (2010), which was a collaborative article submitted to the *Bulletin of the American Meteorological Society* about the May 1-2, 2010 Mid-South flood with Drs Durkee, Mahmood, and Foster along with three student co-authors (current Meteorology majors Lee Campbell, Kyle Berry, and Dustin Jordan). Kalkstein and Goodrich (2011) is an article linking air pollution and precipitation in



Phoenix, Arizona, to climate teleconnections such as the Pacific Decadal Oscillation. This article, begun in 2005 when Dr Goodrich was a graduate student at Arizona State University with Dr Kalkstein (now with the U.S. Military Academy at West Point), was submitted to the *Journal of the Arizona-Nevada Academy of Science*. Finally, Dr. Goodrich and John Walker submitted an article to *Physical Geography* that categorized the relationship between ENSO and the Pacific Decadal Oscillation in the eastern United States. This article was part of a summer faculty scholarship from 2006.

In the classroom Dr Goodrich taught classes he had taught before, including sections of GEOG 325 (Meteorological Instruments), GEOG 175 (University Experience), and GEOG 424 (Weather Analysis and Forecasting). He is happy to report that students still agonize over the lab write-ups for Met Instruments, although they always turn into better writers by the end of the semester. The Meteorology Program continues to grow and prosper under the guidance of Dr Goodrich. The second cohort of graduates in the new B.S. degree in Meteorology found success in the job market in 2010-11. Two graduates were hired by the National Weather Service (Brittany Whitehead – Nashville, TN, and Sam Roberts – Morristown, TN) and another continues to work for UPS and hopes to transfer soon to his dream job with flight operations in Louisville (Landon Hampton).

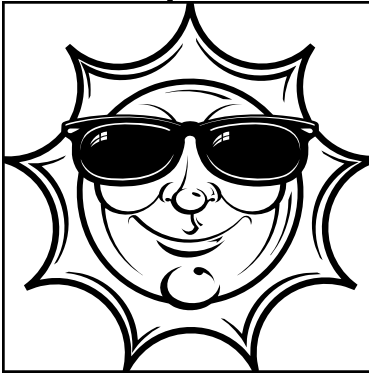
Two other graduates received assistantships to continue their education in graduate school (Luke Miles – Western Kentucky University and Sarah McCann – Mississippi State University). Two current students received SCEP internships in a year when NOAA drastically reduced the number of available internships. Mitchell Gaines was placed in Philadelphia while Evan Webb was placed in Louisville. Ian Blaylock continued his SCEP from last year in Alaska. All three students are guaranteed a job with the NWS upon graduation. Finally, rising senior Kyle Mattingly spent the summer in Maine as part of his NOAA Hollings Scholarship.

MARGARET “PEGGY” GRIPSHOVER spent the previous year immersed in baseball, horses, karst,

and onions, which sounds like a terrible recipe for dinner but makes for an interesting research agenda! In addition to her research, she taught a variety of classes including World Regional Geography, Honors in World Regional Geography, Cultural Geography, and Geography of Kentucky. “Dr. G.” has also been advising graduate students and serving on graduate student committees. Along those lines, she and co-chair Dawn Drake, organized a panel discussion on graduate student teaching at the annual meeting of the Southeastern Division of American Geographers (SEDAAG) in Birmingham, AL, in November, 2010. The purpose of the panel was to share best-practices and advice for graduate students who have lecturing duties. Peggy, and husband Dr. Tom Bell, continued their co-editorship of the international journal, *FOCUS on Geography*.

When not teaching or editing, Peggy has been busy with an active research program. She continued working on her “Lucky Charlie” Weeghman book manuscript and languishing in the futility of rooting for the Cubs to win the World Series. In between wallowing in self-pity about the Cubs, she managed to produce a journal article based on one of her book chapters for *The Baseball Research Journal* (BRJ), a publication of the Society for American Baseball Research. The article titled, “Weathering Spring Training in 1914: The Chicago Federals in Shreveport, Louisiana,” appeared in the Spring 2011 issue of the BRJ. In the spirit of sustainability, Peggy also presented a paper on this same subject at the Association of American Geographers (AAG) annual meeting in Seattle, WA, in April, 2011. And to further maximize the use of resources, while at the AAG meeting in Seattle, Peggy was a poster co-presenter with colleague Debbie Kreitzer. The title of the poster was, “Spatial and Temporal Variations in Breeder and Ownership Characteristics for Kentucky Derby Winners, 1875-2010.”

Speaking of horsing around, Peggy will be continuing her research on Derby winners this coming year. She received a New Faculty Grant to study equine landscape and land-use change in Kentucky with a focus on farms that served as the birthplaces of Kentucky Derby winners. And speaking of Kentucky



research topics, in June, 2011, Peggy presented a paper titled “Digging Deeper into a Bowling Green, Kentucky, Karst Legend: The Uncle Henry Story” at the International Conference on Karst Hydrogeology and Ecosystems meeting held at WKU. Henry Jamison was featured in a 1921 article in *Popular Mechanics* magazine. Born into slavery in Kentucky in 1843, Jamison served as a substitute for a white draftee in the Union Army during the Civil War. He became famous for being featured in the *Popular Mechanics* article on Bowling Green, which highlighted the city’s reliance on sinkholes and subsurface drainage as its sewer system (not a good idea, by the way!). The article claimed that Jamison had a special talent for finding sinkholes into which city residents could straight-pipe their untreated waste. Again, not a good idea for water quality or public health! Peggy is preparing a journal article based on her “Uncle Henry” research and hopes to submit a manuscript in the coming year.

Which brings us to onions. Along with husband Tom, Peggy has been working on an onion research project for several years. This very “a-peeling” research topic was turned into a journal article titled “Patently Good Ideas: Innovations and Inventions in U.S. Onion Farming: 1883-1939, which will appear in a forthcoming issue of the journal, *Material Culture*. In this article we examined the correlation between specialized onion farming and patents for onion-related inventions. The conclusions will literally bring tears to your eyes! When not busy teaching or working on her research, Peggy enjoys traveling with Tom and their Australian Shepherd, Sophie. When not exploring blue highways (sans GPS!), she has fun cooking, gardening, and playing tennis. Peggy and fellow WKU employee Sue Parrigin were the winners of two ladies’ doubles championships at tournaments held in Bowling Green in 2011. Thanks to playing a lot of tennis, she now keeps a bottle of Aleve handy at all times!

CHRIS GROVES continued work with colleagues to move the Hoffman Institute’s international programs forward on several continents, in between teaching, research, and committee

assignments back home at WKU. He is very pleased to be joined by new department faculty Drs. Jason Polk and Leslie North, who will add enormous strength to the Institute's science, education, and policy programs, as well as Dr Jun Yan, who will join forces with us to bring powerful skills in Geographic Information Systems. Things went especially well in the Crawford Hydrology Lab, led by the skillful work of Lee Anne Bledsoe and Joe Ray and efforts by a number of students and staff.

For his efforts at WKU, in the region, and globally, Groves was appointed this year as a Distinguished University Professor. Along with sections of his favorite class—Introduction to Physical Geography—he taught two new courses this year including *Karst Environments* with Dr Polk and *Carbonate Geochemistry*. Happily, graduate students Ben Miller and Dan Nolfi both finished their program, and Sarah Arpin made good progress on thesis work on the hydrogeology of the Haney Limestone.

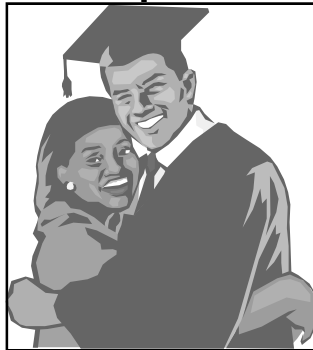
As in recent years, Chris made a number of trips to China, including several days in September at the beautiful Longsheng hot springs area in the mountains of northern Guangxi, where he and his colleague Zhang Cheng completed a proposal to the United Nations for a new five-year scientific effort: *Environmental Change and Sustainability in Karst Systems*. This was subsequently approved by UNESCO in Paris in February, with additional funding from Sweden's International Development Agency for the project's strong capacity building efforts. In a separate effort during the trip, Groves met with the Barbados Ambassador to China Sir Lloyd Sandiford and representatives from China's Ministry of Land and Resources to sign a trilateral agreement for cooperation in science, education, and capacity building focused on environmental issues in the three countries' karst regions.

Groves returned to China for a one-day meeting of the Academic Committee of the Karst Dynamics Laboratory at the Institute of Karst Geology in December, setting a new personal record for rapid travel, leaving Thursday and returning home by Monday, including a stop in Beijing. One hope was to totally bypass the time-zone adjustments on such a short trip, but it didn't quite work and Groves ended

up wandering around in a jetlag-induced fog for about a week after returning home.

In January, Groves joined Polk, North, Pat Kambesis, and Mike Lace at Harrison's Cave in Barbados, where they worked with the Government-owned cave operation to develop new, education-based "wild cave" tours, mapping out the routes through the cave, and training the guide staff. They also continued efforts to develop the US-Barbados-China trilateral agreement in a meeting with the Barbados Minister of the Environment.

In July 2011, this time joined by his wife Deana and daughters Lillian and Leah, Groves returned to the Institute of Karst Geology in Guilin, China, for two months of research and immersion in the country's language and culture for the whole family. As always, China is endlessly fascinating but certainly living there is a big adjustment! One slice of home, though, is Guilin's new Walmart, which except for the live frogs and turtles in the grocery section, and all of the Chinese people, is pretty much like Walmarts anywhere.



DAVID J. KEELING writes

that his eighteenth year in the Department, and tenth as Department Head, continued to generate challenges, excitement, multiple international trips, a couple of informative conferences and workshops, and lots of hard-working students to keep him extremely busy.

Global travel, of course, remains the highlight of Dr Keeling's year! For four weeks in May-June 2010, he led the annual study abroad program to Argentina, accompanied by Will Blackburn. After a few days in Buenos Aires, the 11-student group set off on an 8,000 km circumnavigation of the northern half of Argentina, with visits to Iguazu Falls, the missions, the Gran Chaco, Salta and the northwest, wine country around Mendoza, the Uspallata Pass, and traditional pampas grasslands town of Santa Rosa. The program ended with a final five days back in Buenos Aires.

In late July, he traveled across the big pond (the Atlantic) to Lincolnshire, England, to develop a research project on rail freight challenges in the western part of this very rural county. A follow-up

trip to Lincolnshire in October laid the foundation for the first of two articles on transportation development, the first of which appeared in *FOCUS on Geography* this past summer. Over Thanksgiving, Dr Keeling headed back across the Atlantic again for a lecture visit to southern Ireland, where he gave a talk titled *Transportation Geography: New Directions, Familiar Challenges* in the geography department at University College, Cork.

International travel for the academic year culminated in an Around-the-World expedition sponsored by the American Geographical Society, on which he served as a lecturer. The three-week program visited Machu Picchu, Easter Island, Samoa, the Great Barrier Reef, Angkor Wat (Cambodia), the Taj Mahal and Rajasthan (India), the Serengeti, and Petra (Jordan).

Locally, Dr Keeling served on a history Ph.D. dissertation committee at Rutgers University in New Jersey, attended a council meeting of the American Geographical Society in Brooklyn, NY, and presented research at the annual conference of the Association of American Geographers in Seattle, WA. He also presented a paper on his Lincolnshire research at the annual conference of the Kentucky Academy of Science convened at WKU in November.

Within the community and on campus, Dr Keeling gave several talks on issues ranging from cyberwarfare and geopolitics to WKU's international reach, appearing twice on the WKYU-TV program *Outlook*. He also gave a talk at the Village manor retirement community on Latin America. Dr Keeling also continued to serve as a National Councilor for the American Geographical Society, and as the webmaster for the Society (visit www.amergeog.org).

As Department Head, Dr Keeling still attends way too many meetings during the year, but managed to contribute to a number of college and campus-wide committees and initiatives, and to international education on campus. Moreover, he continues to publish the results of research, with several articles in print or in press as the year came to an end. His photoessay titled "Off the Beaten Track - Imaging Geography's Remote Destinations" appeared in the Fall 2010 issue of *FOCUS on Geography*, and he

inaugurated a new feature in the same journal titled "A Picture is Worth a 1000 Words," contributing the first two essays to this feature. Two "Annotated Websites" contributions appeared in the *Journal of Latin American Geography*, and a retrospective on urban geographer Larry Ford's work in the *Geographical Review* is scheduled for publication in Fall 2011. He also reviewed 16 different manuscripts and book proposals for a number of publishers and academic journals during the year.

Finally, he served on a number of graduate committees in the Department, with Kay Gandy and Dustin Winchester finishing up their M.S. Geoscience teacher education program, and Jon Hall and Elizabeth Schmitz successfully defending their M.S. Geoscience research theses.

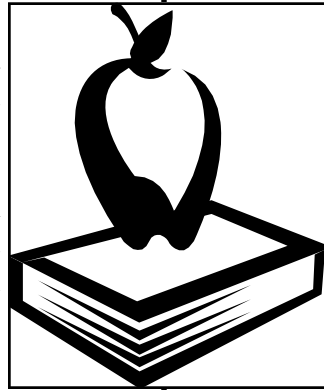
Congratulations to all of our program majors and graduate students who left the Hill this past year with degrees safely in hand and great career opportunities in front of them—stay in touch!

As always, Dr Keeling encourages past, present, and potential students to come by and share travel stories, information, and geographic tidbits. He can be reached easily in cyberspace at: david.keeling@wku.edu or by phone at (270) 745-4555. Also, visit Dr Keeling's homepage on the World Wide Web— just enter:

<http://people.wku.edu/david.keeling>.

DEBBIE KREITZER writes that the 2010/2011 school year was another exciting and productive one, as she spent another industrious year teaching, researching, and planning new geographical experiences. Debbie is involved in teaching *Fundamentals of GIS*, *Geography of North America*, *World Regional Geography*, and *Population and Resources*. She is also teaching two online courses for Independent Learning; *World Regional Geography* and *Natural Resource Management*.

Along with the other faculty in the Department, Debbie is also dedicated to continue learning by attending research conferences and meeting with experts and colleagues in the field of geography. In April she attended the annual meeting of the Association of American Geographers (AAG) in Seattle, Washington. She presented a poster with her



colleague Dr Peggy Gripshover that reported on an examination of the spatial and temporal patterns of owners, breeders, and sires of Kentucky Derby winners. Since horses are a passion of Debbie's, this research was particularly fun and interesting! She also produced the maps for a book written by WKU history professor Carlton Jackson about the inaugural trip of president-elect Andrew Jackson to Washington, D.C.

Debbie spent the summer visiting family in Florida, teaching, and exploring the local landscape on horseback with her horse, Red Copper. Debbie is planning a study abroad course to the Adriatic Sea and Balkan Peninsula for summer 2012. Participating students will visit places like Dubrovnik, Croatia, the Dalmatian Islands, Bosnia, and Slovenia. For more information about her research or about study abroad (including how to sponsor a student on a study abroad trip), please contact Debbie at this email address <debbie.kreitzer@wku.edu>.

REZAUL MAHMOOD has continued to focus on teaching, research, and service and remained productive. During the past academic year, he taught hydroclimatology and several independent study courses. Rezaul's research focus remained anchored in the impacts of land-use change on long-term climate, soil moisture modeling (as it relates to climate), land surface-atmosphere interactions, modeling of transport of aerosols, and the hydrometeorology of flash flooding in eastern Kentucky and the Appalachian region. Five graduate and seven undergraduate students participated in these research activities and gained hands-on learning experience.

Rezaul sponsored or co-sponsored thirteen papers/posters presented by the students at the 107th Annual Meeting of the Association of American Geographers (AAG) at Seattle, WA; the 65th Annual Meeting of the Southeastern Division of the AAG (SEDAAG) at Birmingham, AL; the 96th Annual Meeting of the Kentucky Academy of Sciences, Louisville, KY; and the Severe Weather Workshop in Norman, OK.

During the past academic year, he published his research in peer-reviewed journals including *Global*

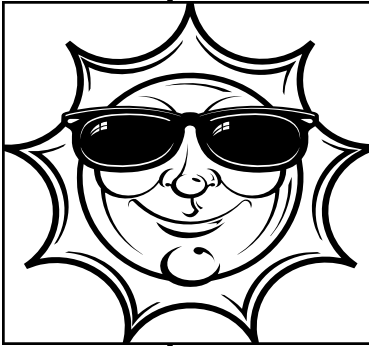
and Planetary Change, Theoretical and Applied Climatology, Progress in Physical Geography, Water, Air, and Soil Pollution, and the Journal of Hydrometeorology. Rezaul has continued to serve as Editor of the journal *Earth Interactions* and he also serves on the editorial board of *Geography Compass*.

Rezaul has completed another successful and fulfilling year of co-directing the second year of a current NSF-REU project (2010-2012; PI-Cathleen Webb; Co-PI Rezaul Mahmood; Budget: ~\$350,000). The project engaged 10 faculty from G&G and Chemistry and 12 students in research. Eight of these students came from various other institution across the nation.

Like over the past several years, Rezaul has spent significant time and effort in expanding and operating the Kentucky Mesonet (PI-Stuart Foster; Co-PI-Rezaul Mahmood). It is a ~\$3m project funded by NOAA that allowed us to establish a research grade operational network for weather and climate observation in Kentucky. It is only the second of this type of network in the entire world. The network currently operates 58 stations and hopes to expand to 64 stations shortly. Live data can be viewed at www.kymesonet.org.

Over the last couple of years Rezaul has been busy working on building the WKU-High Performance Computing System (PI-Claire Rinehart; Co-PI-Rezaul Mahmood). This is ~\$2.4m system that would be open to the entire WKU community for research and education. The system became operational this August (2011). It is funded by the U. S. Department of Education. The Kentucky Mesonet and our weather and climate modeling activities over the last several years played a key role in the original effort to obtaining funding for the computing system.

Rezaul's research on micro- and meso-scale land surface atmosphere interactions and aerosols transport funded by the United States Department of Agriculture (USDA) has continued (Budget: ~\$147,000). This funding allowed him to hire a post-doctoral research associate and recruit several undergraduate students. Rezaul submitted several large competitive grants, including one to the USDA (Total budget: ~\$2.3 m) to study land surface-



atmosphere interactions and modeling. He also collaborated with Dr Xingang Fan on grant proposals (NOAA Budget: ~\$300,000).

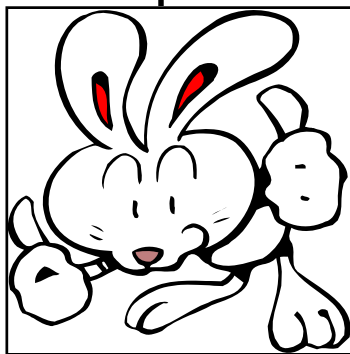
MICHAEL MAY is ready to get immersed in formal teaching again this fall after enjoying a spring semester sabbatical in which he investigated the Mississippian and Pennsylvanian strata in the south central Kentucky region. The sabbatical permitted him time to finish his manuscript on oil-rich sandstones and conglomerates in south-central Kentucky, which is to be published this fall in the high-impact AAPG Memoir (book) series. He was also engaged in a pilot project related to heavy-oil production during the sabbatical period that was chronicled in his manuscript. He was not totally away from students, however, during this sabbatical, as he engaged three upper-level undergraduates – Chris Driver, Keith Conn, and Buddy Price - in a study of the rocks around Lake Malone and adjacent Muhlenberg, Todd, and Logan counties. This project resulted in a presentation by the students at WKU's Student Research Conference entitled "New Investigations of an Ancient River System: Refining the Geologic Models of Pennsylvanian Paleovalley Fills in Western Kentucky with Implications for the Development of Groundwater and Petroleum Resources."

Students were able to make 3-D surfaces in GIS as well as traditional cross-sectional views of the ancient river system. Field work revealed the orientation of major trunk paleovalleys in the outcrops around Lake Malone. An additional area of study included producing a Gamma Ray profile of Pilot Rock, an isolated Pennsylvanian sandstone/conglomerate outcrop outlier in northern Todd County. It turns out that Pilot Rock has great historical significance in the settling of south-central Kentucky, and now it has been characterized in detail geologically.

Other research interests of Dr May's over the last year included studying river (fluvial) system deposition and erosion and how these processes contribute to the complexity of aquifers. He presented this research at the November 2010 meeting of the KAS Geology Section in Bowling Green. He collaborated with Thomas Brackman of NKU on

running the Geology Section at KAS and also made it possible for Professor Brackman and his students to conduct additional geophysical mapping at the Upper Green River Biological Preserve (UGRBP) this past March. The UGRBP now has a small cave characterized with ground penetrating radar and microresistivity, in addition to earlier studies of karst features and the bedrock-soil interface along the Green River. Plans are being made to have a geophysical institute or joint training session for NKU and WKU geology students at the UGRBP, a great venue that is cost effective and one that possesses great field areas to study for many a budding scientist.

Dr May has been asked to be part of the UGRBP Science Board because of his engagement of students from WKU and NKU at the preserve and he is looking forward to many more adventures and learning opportunities with students there and helping with additional land acquisition with Drs Ouida and Albert Meier in Biology. If anyone is interested in finding out more about scientific study and learning opportunities at the UGRBP please let Dr May know. Classes taught by Mike



in the fall of 2010 included the usual environmental geology and typical undergrad gen-ed courses and a new course was taught – sequence stratigraphy. He is also developing yet another new course for Fall 2011 dubbed Basin Analysis. As of this writing there are 14 students enrolled in the course that will investigate crustal and mantle interactions, types of depositional basins, the mechanics of crustal dynamics, as well as geothermal history investigations. This course should dovetail with Mike's recent offerings in subsurface geologic methods and sequence stratigraphy.

Other activities that Mike has been involved in over the past year in addition to duties as the Geology Program Leader (sans the spring when Dr Siewers provided great leadership for the program) included participation in the Kentucky Geological Survey's Annual Meeting in Lexington as an invited panelist before Len Peters, Energy and Environment Secretary, and resubmittal of a draft of the Reynolds Grant for a Geoscience Resources Laboratory. This proposed laboratory is envisioned as a 20-seat computer lab space in the EST building and having a

small shared space at the Advanced Materials Institute (AMI). The computer lab will have the ability to access Kentucky Geological Survey oil and gas data, and students and faculty will be able to import these data into Petra, the oil and gas industry standard software package.

Faculty and staff are hopeful this proposal will soon be funded, as it will create great learning opportunities and higher industry internship potential for WKU students. Additional funding for the Geology Program continues to come from Bill Dost of Oklahoma who kindly endowed the William F. Dost, Jr. Endowment for Energy Studies through the WKU library system. The geology faculty are excited about the continued support of Mr. Dost, a 1979 B.S. Geology alumnus.

On a personal note, Mike and his wife Beth have sent the eldest 'Maylet' off to college to the University of Evansville, which apparently has a much stronger Men's Soccer Program than the one at WKU! The second son, Kevin, is now a big junior at BGHS and he is thinking of going to Germany in spring of 2012 as an exchange student. If this comes to pass there will be at least a semester-long empty nest at the Mays. The years sure spin by fast!

AMY NEMON writes that Fall 2010 marked the start of her fifth year of teaching for WKU. She continues to be located in Glasgow with one day a week in Elizabethtown. She started the year by attending the annual ESRI conference in San Diego. This conference was a great opportunity to see the new innovations leading the GIS community. Amy continued to teach GIS for the department during the 2010 and 2011 summers. These courses have been a hybrid of online and face-to-face meetings, which present a number of new challenges in teaching. Amy hopes to bring GIS back to the extended campuses in the near future. This past year Amy also taught World Regional Geography, Geography of North America, and Geography of Kentucky. This coming fall, Amy will be bringing back the Geography of Russia to the department.

Amy continues being active on the Kentucky Geographic Alliance's (KGA) steering committee and received a two-year appointment representing the

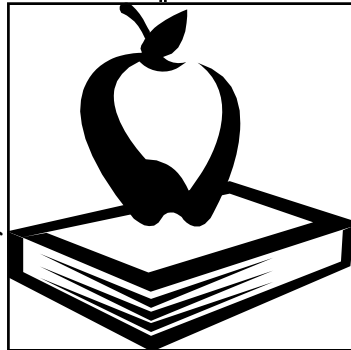
KGA at the KCSS (Kentucky Council for Social Studies) quarterly board meetings. Amy also was asked to serve on the Kentucky Geographic Names Committee (KGNC). Other endeavors include attending the first sustainability conference held by WKU's Center for Environmental Education and Sustainability. Amy also attended its summer institute held for a week at Land Between the Lakes. This was an incredible adventure, bringing together teachers from around the state to explore the possibilities, at all education levels, of bringing the environment into the classroom. Amy plans on taking more of the classes offered in the Environmental Education endorsement program.

This past spring Amy officially became the lead event planner for the National Geographic State Bee with the state coordinator. This is the 9th year the event has been held in Bowling Green at the Knicely Center, (this is the 23rd year of the event). It was very exciting to see so many students from around the state who were very geographically aware! This event was also very special as the first female was crowned the state champ!

Amy continued teaching Super Saturdays classes for the Center of Gifted Studies at WKU. She engages middle school students in geography and art classes. She is thinking about getting more involved with the Center and teaching during its SCATs camp for middle-school scholars.

Amy's research interests are still strongly geared towards K-12 geography education. She would also like to spend time researching health/disease issues in Kentucky and the United States. Particular interests include the location of Kawasaki Disease outbreaks (a children's disease), and georeferencing meth labs throughout the country to uncover patterns.

JASON POLK continued to keep a busy schedule as he settled in at WKU, developing new research projects, courses, and opportunities for student engagement. He has enjoyed the warm welcome from the department and the opportunities to be involved in a variety of different activities related to his teaching and research interests. Dr Polk also settled in at home, working on house projects, and



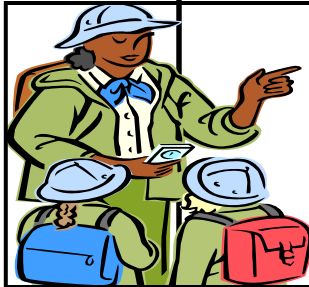
caving when possible in the area

Dr Polk taught several courses this past year, including co-teaching a new Karst Environments course with Dr Groves focusing on caves, springs, groundwater, and other aspects of karst landscapes, which worked well in the iconic karst area of south-central Kentucky. In addition, he helped to develop a new Karst Geoscience undergraduate geography track, the first of its kind in the US, and is excited to welcome students to the program!

In the Spring, he taught Geomorphology and led an amazing fieldtrip to the Ozarks to examine the multitude of excellent geomorphological landscapes offered there. The students visited caves, springs, fluvial systems, an igneous gorge, and learned about the evolution of the landscape. Dr Polk also hopes to continue a project started in his Field Methods course last Fall, which involved working with Lost River Cave on a service-learning project. This required the students to use various data collection techniques, including water quality testing, dye tracing, and mapping, to help determine hydrological and land-use impacts from a recently established wetland area that helps to filter storm-water runoff. This project was a great success at student engagement and he looks forward to continuing and expanding it in the near future.

Dr Polk continued to be involved in various service activities, including advising the Green River Grotto student organization, which has been very active recently in local cave survey and exploration. This summer he worked on creating educational signage about karst groundwater and planning for several workshops for the Southwest Florida Water Management District and the Withlacoochee State Forest in Florida. He also served as Program Chair for the 2011 International Conference on Karst Hydrogeology and Ecosystems held at WKU in June, which had nearly 100 attendees from 16 countries and provided an opportunity to share knowledge and ideas about current research. Dr Polk continues to be quite active with the Hoffman Environmental Research Institute and its myriad national and international projects and student engagement activities.

One major focus this past year was to work on a new website, logo, and infographics for the Institute



in collaboration with local graphics artist extraordinaire, Joneo (Jonathan Oglesby), and web guru Taylor Hutchison, who have done spectacular work in establishing the Hoffman Institute's online presence and bringing them into the social media network to provide for better student recruitment and research opportunities. Together with students, staff, and colleagues, he is excited by the Hoffman Institute's growing synergistic educational and research programs around the globe and eager to continue creating opportunities for students to be involved in these activities.

In establishing and diversifying a research program, Dr Polk, his students, and the Hoffman Institute were all quite active this past year, submitting several collaborative and individual proposals that were funded by a variety of agencies. Dr Polk is currently working with graduate student Sean Vanderhoff to wrap up his thesis on agricultural contaminant transport in the karst region of south-central Kentucky, and with Celia Davis on her research related to the spatial analysis of white-nose syndrome in bats. His other work with a number of students involves research projects related to environmental education, developing an online karst assessment tool, and geo-archaeology related to Maya collapse. He welcomed several new students this semester, who will be engaged in a variety of research projects throughout the Caribbean, US, and elsewhere as they begin their graduate research. Dr Polk has plans in the coming months to attend several local and national conferences to disseminate his findings from recent scholarly activities, and is also planning to perform international fieldwork in Puerto Rico, Belize, and Barbados.

Dr Polk currently has several other collaborative research initiatives underway, including work throughout the Caribbean, China, US, and elsewhere related to climate change, karst groundwater resources, and geomorphology. He recently published articles in *Hydrological Processes* and the *Journal of Cave and Karst Studies*, and currently has in preparation or under review several additional articles this year related to a variety of research topics, as well as working on a co-authored book chapter on Florida's Coastal Karst for the book *Coastal Karst Landforms*.

Beginning his third year in the Department, Dr Polk is already enjoying a productive start, with several new projects and grant proposals on the horizon, new graduate students to advise, and new ideas in development. Additionally, he has more adventures planned for this year to engage students, conduct fieldwork, and nurture collaborations. He looks forward to a new and exciting year, and wishes everyone the best in their adventures!

FRED SIEWERS continues to have good and productive years at WKU. During the 2010-2011 academic year, he taught general education courses on Earth History, as well as upper-level courses in Paleontology, Sedimentology-Stratigraphy, and Professional Preparation, the geology program's senior capstone experience. His Paleontology and Sedimentology-Stratigraphy courses featured field trips, including a new fossil-collecting trip in the Leitchfield, KY, area (bountiful blastoids!) and a trip to the wonderful Paleozoic section at Pound Gap on the Kentucky-Virginia border - an annual trip for students in the Geology program. As usual the field trips were semester highlights.

The Professional Preparation course was noteworthy for the number of WKU graduates that came to speak to the class. This year's speakers included David Doyle (EnSafe, Bowling Green), Cody Munday (TPM Environmental, Bowling Green), Craig Calkins (Nexen Inc., Dallas), Todd Johnston (KY Dept. for Environmental Protection), Robert "Bo" McCue (Sunburst Consulting, Pittsburgh), and Laura DeMott (ExxonMobile, Houston). Their presentations were excellent! The students in the class really appreciated their insights and advice about professional life after WKU.

Dr Siewers continued his research on carbonates and worked with three undergraduates on a variety of research projects. One student worked on a project involving the diagenesis of altered high magnesium calcites in Pennsylvanian fossil peats. Two other students worked on the geochemistry of ostracodes (bivalved crustaceans) from a hypersaline lake in the Bahamas. These projects led to presentations at the

annual Kentucky Academy of Science meeting and the WKU Student Research Conference.

Dr Siewers led a new initiative designed to get more students to professional conferences. Through generous Departmental and Ogden College support, eleven geology majors attended the 2010 Annual Meeting of the Geological Society of America in Denver, CO. Their attendance at the meeting was connected to their majors-level coursework at WKU. Students had to read abstracts, attend talks, and summarize presentations in the areas of paleontology, mineralogy, and environmental geology. Students also attended career-mentoring sessions, learned about job possibilities in geology, spoke with representatives from a wide range of geology graduate programs, and participated in a geology field trip to the front range of the Rockies. By all measures, this experience was a tremendous success! Not only did students enrich their WKU geology courses, they got to see the discipline of geology in action in a professional setting.



In summer 2011, Dr Siewers co- led a National Collegiate Honors Council "Faculty Honors Institute" into the south-central Kentucky cave country. Entitled "Seeing Beneath the Surface," honors faculty from Kentucky, North Carolina, and Iowa explored the physical and cultural landscape of the Mammoth Cave area through the lens of "Place as Text", an innovative experiential learning pedagogy. Participants were treated to an exceptional "off-trail" Mammoth Cave tour led by WKU geology and MS program graduate Johnny Meredith, surface hikes in MCNP, and cultural explorations in the communities of Park City, Cave City, and Horse Cave. From Floyd Collins to shape-note singing in a missionary Baptist church, the Institute participants truly "saw beneath the surface" of south-central KY!

Finally, during this past year, Dr Siewers was selected to spend the Fall 2012 semester at Harlaxton College, England, to teach geology and environmental science courses to WKU students and students from other institutions. He is already thinking a lot about his "Geology of Britain" course, which will feature field trips to sites important to the discipline of

Geology. As always Dr Siewers enjoys keeping up with Departmental graduates, whether face-to-face or through e-mail, phone, or social media (yes, you can "friend" him on Facebook). Please do keep in touch!

ANDREW WULFF continued to develop undergraduate research opportunities, be involved at a high level in field-based geology research and learning, and augment the analytical side of "hard rock" geology at WKU. Andrew and his students were active at professional meetings, as they combined for seven research presentations at regional and national scientific conferences. Andrew is currently supervising undergraduates working on projects including the igneous petrology/geochemistry of lavas, characterization of ore suites, models of ore petrogenesis, geothermobarometry of high-grade schists, carbonatite geochemistry, and the use of Raman microscopy to elucidate zoning profiles in minerals. Having good analytical facilities leads to so many exciting research experiences for our students.

A new interest in mining and resource exploration (prompted maybe by gold at about \$1800/ounce!) means that Andrew will be offering a new course in Economic Geology in the fall semester.

If you have access to ore samples – please consider sending them to us for analysis in this course. Several alums have already sent boxes of ore from various locales – thank you! Dr Wulff will be working again on the EARTHSCOPE project with folks at Illinois State University, leading workshops that develop the principles of magma generation along volcanic arcs, and eruption prediction techniques. He is hoping that his involvement with this national program will lead to bringing EARTHSCOPE to Kentucky.

Andrew once again taught three weeks of the summer field geology course with students from eight universities (see story and photo in this edition). Once again, students unraveled the geology of Montana, Wyoming, and South Dakota – and braved lots of snow, some sleet, wind, dense fog, and – even

occasional beautiful weather this year. In short, it was a typical great field camp. WKU Geology majors earned the two highest grades in the course for the second time in three years, demonstrating the strength of our program. Buddy Price and Melanie Newton (see elsewhere) were both nominated for USGS/NAGT internships as a happy consequence of their achievements. Strong performance in the field course leads to these great "door-opening" internships. Thank you to all who have been financially supporting our many field-based opportunities, which develop our students so that they can earn such great recognition - and get a jump-start on professional careers!

Dr Wulff is serving another three-year term as a national Councilor in Geosciences for the Council on Undergraduate Research (CUR), and will once again be going to Washington in September to advocate for increased funding for the geosciences. Much time was



spent with the university-wide General Education Review Committee, charged with overhauling the entire General Education program at WKU! It looks as if there will finally be a new plan that will more intentionally connect courses and introduce

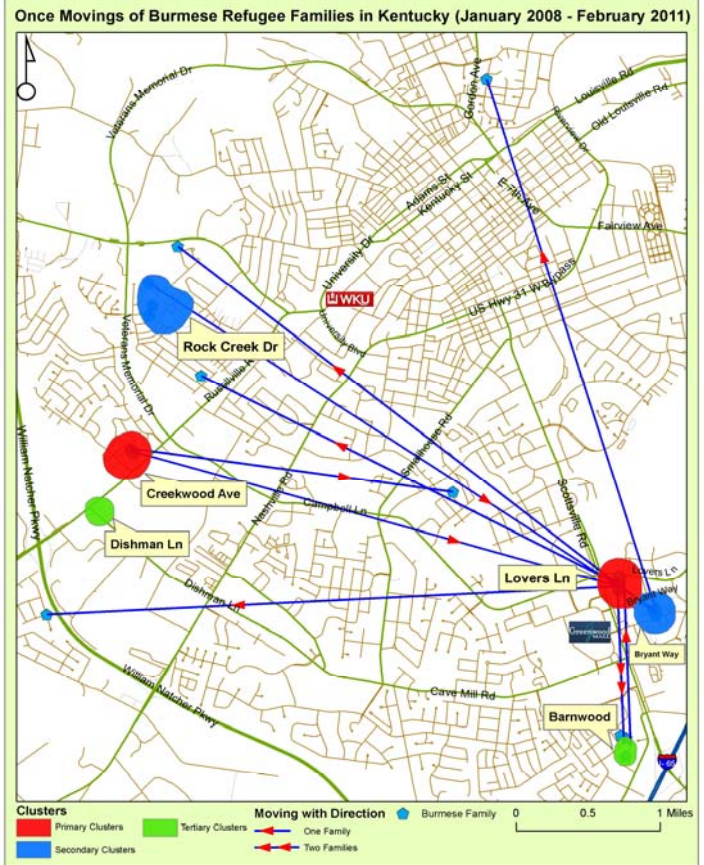
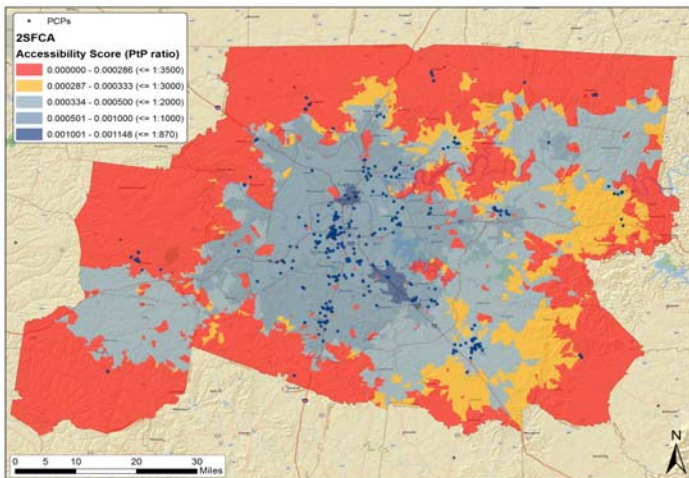
more accountability to all Gen Ed courses. Andrew developed an interdisciplinary Science Core course for the Honors College, and presented it to a national meeting of the National Collegiate Honors Council, where it (and the entire Honors College plan) was received enthusiastically. The new charge is to develop a parallel interdisciplinary science course for the rest of the university.

Dr Wulff is committed as ever to bringing more earth science to the K-12 classrooms in the area and he and his students contributed approximately 1500 "contact hours" with students (primarily 4th, 5th, and 10th graders) at schools in the Bowling Green area this past year. Andrew continued to train geology majors to help present aspects of geology to students at area elementary and high schools and become more

involved in the community. Topics included the wonders of rocks and minerals, aspects of structural geology, geological hazards, maps, earth resources, groundwater, and limestone dissolution.

Andrew enjoys the challenges of identifying rocks and minerals brought to the department by folks from all over the area, which this year included proposed meteorites, sedimentary iron deposits, carbonates of all sorts, fossils, artifacts, and various ores (from New Mexico, Honduras, Nevada, Arizona, Oregon, and even Kentucky!). If you have samples or questions – bring them in! He continues to be involved in the community as a certified Community Emergency Response Team (CERT) member, giving interviews on radio and TV, and giving presentations on earthquake preparedness, and radon analysis and mitigation. Both kids are playing several sports and taking piano and cello lessons, with many additional activities to keep Dad running – and young (or so they say!).

JUN YAN had a productive 10-11 academic year. He taught several upper-division GIS and technique courses, including GIS Programming, Urban GIS Applications, and Geoscience Statistical Methods. Dr Yan’s courses often involve a lot of hands-one practices and his students were able to gain experiences from a number of real-world projects, including the assessment of fire response, crime analysis, site selection, urban commutes, etc. Currently Dr Yan, along with his colleagues in the GIS Program, is migrating all GIS courses to ArcGIS 10. In particular, Geog 419(G) GIS Applications Development was renamed to GIS Programming,



where students will learn advanced geoprocessing techniques in-depth with both ArcGIS ModelBuilder and Python scripting. The change of focus for Geog 419 (G) will prepare WKU students better for the needs of the fast-changing GIS job market.

Dr Yan also had a very productive year research wise. A paper titled *Hydrochemical Variations of Epikarst Springs in Vertical Climate Zones: A case study in Jinfo Mountain National Nature Reserve of China* was published in the international journal, *Environmental Earth Sciences*, which explores the influence of elevation on groundwater hydrochemistry in the karst regions of Southwest China. In the past year, Dr. Yan also advised several Master’s students and two of them successfully defended their theses. Sami Almudaris’ thesis examined the issues related to spatial accessibility of primary care physicians in the Nashville area, while Nate Oris studied the spatial patterns of fatal crashes in Kentucky as well as the roles of non-spatial factors, such as time of a day, season, day of a week, DUI, age of drivers, etc. The findings of both projects are very useful for the informed decision-making by various government agencies. In addition, Dr Yan



Margaret Crowder at Graceland

served on the Ed.D. committee of Donna Renaud, whose dissertation investigates the assimilation process of Iraqi and Burmese refugees in the Bowling Green region. One of his Master's students, Huajian (Thomas) Zhang, has assisted this project in the area of data collection, data analysis, and mapping. They hope that findings from this project can help the Bowling Green International Center develop strategies that facilitate the integration of refugees in the local communities. All in all, Dr. Yan is very proud of all these achievements made by his students. They deserve a big thumbs-up for their hard work.



John All in the Peruvian Cordillera



Dr Kuehn Presents the Jason Shaw Award



Honors Night, April 2011



Ann Epperson Receives the Outstanding Geoscience Graduate Award from Dr Katie Algeo

ALUMNI CONTRIBUTIONS

Contributions to the Department of Geography and Geology Development Fund in 2010-2011 stayed steady during the year, a reflection of the tough economic times we face. The number of individual contributions to our Fund exceeded the 100 mark! Thanks to everyone for helping us achieve our goals this year; we were able to support several students attending conferences, conducting research, and participating in study abroad and study away (U.S.) programs. Your generous contributions go a long way to ensuring that we have sufficient supplies and equipment for student use. When you receive a call from students, or whenever the spirit moves you, make a contribution to the Department and to the University. Be sure to specify that the money be designated for use by the Department of Geography and Geology. Our profound thanks to our contributing alumni. We gratefully acknowledge gifts from:

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and family*

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of the Hoffman
Institute*

ALUMNI NEWS

Alapo, Victoria (M.S. Geoscience 1996) has been accepted into the Ph.D. program at the University of Nebraska, and she still teaches geography in the Division of Social Sciences at Metropolitan Community College in Omaha, NE

Baldwin, Mark (M.S. Geoscience 2007) is a Ph.D. student in Meteorology at Mississippi State University after spending two years at the Tennessee Emergency Management Agency.

Brunner, Chelsea (B.S. Geology 2009) is a graduate student at the University of New Mexico in Earth and Planetary Science. She writes that the incredible one-on-one attention given by the geology faculty at WKU is a real strength. Motivated professors like Drs Wulff, Siewers, and Celestian, who put a real effort into getting undergrads involved in research, make a real difference in the quality of the program.

Burgess, Patricia Chalmers (B.S. Geology 2005) is a geologist working at URS Corporation in Houston, Texas. She writes that the geology program challenged students to go beyond the ordinary.

Cesin, Gina (M.S. Geoscience 2008) is a geospatial analyst in Northern Virginia and is enjoying the east coast lifestyle.

Clark, Paul (B.S. Geology 2005) is a self employed well-site geologist, currently working on a contract project with Sunburst Consulting Inc. in the South Central Kentucky region.

Croskrey, Andrea (M.S. Geoscience 2006) is a Physical Scientist/GIS Specialist for the National Park Service in Colorado.

Davis, Will (M.S. Geography 1997) is a real estate executive with the Litchfield Company Real Estate in South Carolina. Will thinks fondly of his WKU experience, which represented two years of his life away from his SC roots and comfort zone. It was a true



Fill out the Alumni Information sheet on the next page and mail it to the Department today. We want to know how your career and life are progressing. You can also attach a small passport-sized picture of yourself, if you like, that we can publish alongside your news.

“I predict a fantastic 2012 if you send in your Alumni Information sheet right away.....”

graduate school experience and WKU and the Geography and Geology Department were very open to someone seeking that experience.

Embry, C.B. Jr. (B.S. Geography 1963) was recently elected to his fifth term in the KY House of Representatives for the 17th District. He is a former Mayor of the City of Beaver Dam and a former three-term Ohio County Judge-Executive.

Gant, Charles (B.S. Meteorology 2010) works for the National Weather Service in Tennessee.

Haarstad, Håvard (B.S. Geography 2002) recently earned his Ph.D. in Geography at the University of Bergen in Norway, where he is currently a post-doctoral researcher with projects in Latin America.

Hendrickson, Melissa (M.S. Geoscience 2006) is a hydrologist for the Ashley National Forest in Vernal, Utah.

Leeper, Ronnie (M.S. Geoscience 2009) is a research associate with the Scientific Services Division of the National Climatic Data Center in Ashville, N.C.

Littell, Ashley (M.S. Geoscience 2007) is GIS Manager for Connected Nation, and she remembers “fondly” Dr. Keeling’s infamous “10-minute” walks on study abroad programs. Ashley was recently named to the inaugural Vanguard Cabinet by URISA, which aims to engage young GIS practitioners.

Love, Alex (B.S. Geography 2006) is a Systems Administrator with the Warren County Public Library and enjoys blending technology and mapping.

Malone, T.J. (B.S. Meteorology 2010) works for Meridian Environmental Technology in Grand Forks, ND, as a research meteorologist.

Meredith, Brandi (B.S. Geography 2000) moved to the Washington, D.C., area after earning

her J.D. from the University of Vermont and is now an intelligence analyst for the F.B.I.

Porter, Brandon (M.S. Geoscience 2011) has accepted a position with Interact Company as an assistant language teacher in Japan.

Russ, James (M.S. Geoscience 2005) works for the U.S. Army Environmental Command in San Antonio, TX, as a geographer, and felt very well prepared for his current career.

Schenck-Brown, Julie (M.S. Geoscience 2008) has been working as an environmental engineer in Chattanooga, TN, and is seeking new career opportunities in the Huntsville, AL, region.

Schoefernacker, Scott (M.S. Geoscience 2006) has enrolled in the Ph.D. program at the University of Memphis and feels very well prepared after his WKU experience.

Skees, Jacob (Geography 2008) works at Envoy Mortgage as a loan officer in Louisville .

Thomas, Joel (M.S. Geoscience 2004) is a map assistant at the University of Chicago. He enjoyed the flexibility to customize his M.S. program at WKU and integrate other disciplines within a geographic context.



GEOGRAM is designed, edited, and produced for the Department by Dr David J. Keeling.

david.keeling@wku.edu

<http://people.wku.edu/david.keeling>

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GEOGRAM 2011

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