Fall 2005

Geogram 2005

David J. Keeling Editor
Western Kentucky University

WKU Department of Geography and Geology

GEOGRAM

Fall 2005

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

Dear Friends,

2004-2005 proved to be another very successful year for the Department of Geography and Geology. Highlights of the year's accomplishments include the following events and activities:

☺ Faculty and students were featured 40+ times in media print and online articles locally and nationally.

☺ Majors and minors in the Department increased by 15 % over the previous year.

A Letter from the Department Chair

☺ 60 students participated in study abroad programs, field camps, and field trips during the year, with an additional 200+ students visiting Mammoth Cave National Park as a requirement for other courses. Study Abroad field-camp programs are in development for the Bahamas and Tanzania for Winter term 2006, and China for Summer 2006, with over 40 students scheduled to participate.

☺ The Department awarded 22 GIS Certificates this year; and 30 students have completed half of the requirements. A new Graduate GIS Certificate is developed.

☺ Three students received awards at the annual Sigma Xi student conference; 4 students won awards at the annual Kentucky Academy of Science meeting.

☺ Two students were selected for NSF Research Experience summer programs.

☺ 45 students were actively engaged in applied research under faculty supervision through the ARTP and through externally funded research projects.

☺ Faculty and students visited 25 overseas locations for research, professional development, conferences, study-abroad programs, expedition study tours, and collaborative activities, including three separate visits to China, two visits to Bhutan, and a rare trip to Cuba.

☺ Four students participated in karst research expedition to Hunan Province, China.

☺ Nick Crawford received the 2005 *Award for Outstanding Contributions to Karst Science* from the national Karst Waters Institute.

☺ Chris Groves received UNESCO funding to head a five-year international project to study karst aquifers and water resources.

☺ Ken Kuehn received a Distinguished Service Award from the Society for Organic Petrology, an international organization.

☺ Margaret Crowder was recognized as the Young Careerist of south-central Kentucky.

☺ 35 scientists, faculty, and students attended the inaugural Climate Services Symposium of the Kentucky Climate Center.

☺ Chris Groves was elected President of the national Cave Research Foundation.

inside...

Faculty and students continued to excel in scholarship, research, and professional development, convening and/or participating in myriad professional workshops and presenting over 50 papers at local, regional, national, and international conferences. Faculty also were significantly engaged with the local community, serving 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 churches, community organizations, and for service groups.

Three faculty also served as editor or co-editor of professional academic journals, six faculty reviewed manuscripts for academic journals or publishers, one faculty authored a chapter in a new textbook titled *Rural Change and Sustainability,* and another co-authored a new physical geography textbook. Faculty research articles appeared in such diverse outlets as *Geomorphology, the Journal of Latin American Geography*, *Geocarta International*, *Southeastern Geographer*, and *Groundwater*, among others. Ten faculty articles or book chapters are either currently in review, revision, or awaiting publication; one of the Department's newest faculty co-authored a chapter in a new book titled *Economic Impacts of Intelligent Transport Systems*.

In May 2005, the Department recorded **235** majors in geography (211 in 2004), **62** in geology (46 in 2004), and 8**2** total minors (72 in 2003). ***This is a 15% increase in declared majors and minors over the 2003-2004 academic year***. The Department graduated 33 students from its major programs during the year and it has a target of 40 new majors each year to maintain the programs.

The students and faculty of the Department of Geography and Geology again have performed exceedingly well over the 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 15, 2005

** Special Event: Geography and Geology Departmental Tour (Including our new GIS lab and Centers for Applied Research)
Time: 1:00 - 2:00pm
Location: Meet on 3rd Floor EST Building
** **Special Event: Homecoming Tailgating**
Time: 2 p.m. - 4 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.

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VISIT THE DEPARTMENT'S WEBWORLD

The Department's homepage continues to undergo significant updating, with a revamped home page and a redesigned information portal. In addition to the outstanding Kentucky Climate Center site, originally developed by Glen Conner, our State Climatologist Emeritus, and continued by current State Climatologist Stuart Foster, the homepage provides complete program and course information, with links to myriad geography and geology related pages. For instance, pointing your browser to **http://www.wku.edu/geoweb/** will take you to the index page. From here, you can link to all the different types of courses offered by the Department. Many of the course descriptions will have links to the syllabus or to the Professor's personal homepage, to a variety of study guides, and eventually to interactive activities. From the homepage, you can also explore all of the different program tracks offered by the Department and link back and forth to the individual course descriptions within each track. There is always more construction to do, but we hope you find the material available so far informative and useful. Email us with your comments!! We'd love to hear from you.

http://www.wku.edu/geoweb/

Outstanding Geography Students, 2004-05

The Department of Geography and Geography takes pride every year in the quality of its graduating seniors. Students graduating from the various program tracks offered by the Department must pass rigorous course requirements, satisfy applied skills components, and maintain their overall GPAs. All this is often in addition to outside employment demands, public service, family duties, and service to the Department and College. Each year, the Department recognizes its outstanding seniors at a public presentation by presenting them with awards and certificates. The recipients of the Department's highest honors also receive recognition at the University Awards Ceremony.

For the 2004-05 academic year, Cody Holbrook received the Outstanding Geology Senior Award, presented by Dr Andrew Wulff. Ashley Littell received the Ronald R. Dilamarter Outstanding Senior in Geography Award, presented by Dr Stuart Foster. Dan Taylor received the Outstanding Geoscience Graduate Student award, presented by Dr Rezaul Mahmood.

Dr Stuart Foster presents Ashley Littell with the Outstanding Senior in Geography Award at the Annual Awards Ceremony, April 2005

Congratulations to ALL our Outstanding Students!

Introducing Our Newest Faculty Members:

Dr. Greg Goodrich

Dr Greg Goodrich joins the WKU faculty this fall after receiving a Ph.D. in Geography from Arizona State University in Tempe, AZ. Dr. Goodrich and his wife, Demara, are originally from northern Illinois and northern Indiana respectively, and look forward to getting to know Bowling Green and the surrounding community. They are both active runners and have completed five marathons between them. They also enjoy gardening and hiking and look forward to spending time outdoors in the many state parks of Kentucky and Tennessee.

Dr Goodrich's professional interests center on the impact of climate teleconnections, such as El Niño, on drought and other precipitation patterns. He is also interested in how teleconnections of differing spatial and temporal scales interact with each other (teleconnection modulation). While his dissertation research focused on statistical relationships, he hopes to examine these relationships from a synoptic mindset while at Western. His published articles range from the effect of database choice on climate mortality studies, the effect of El Niño and the Pacific Decadal Oscillation on winter precipitation in India, to teleconnection modulation on winter precipitation in Arizona. A publication currently in press examines how well the first-order weather station (Sky Harbor International Airport) spatially and temporally represents Phoenix Metropolitan Area precipitation in winter.

Dr Goodrich will be teaching two sections of Introduction to Meteorology (including one at Glasgow) and one section of Physical Geography during Fall 2005. He will be developing courses in synoptic and mesoscale meteorology in order to improve Geography students' chances of securing operational meteorology positions upon graduation. He is looking for-

ward to working with students who are interested in pursuing careers or graduate education in meteorology and climatology!

Wasatch-Uinta Field Geology Course

Dr Andrew Wulff completed his tenure as Director of the Wasatch-Uinta Field Geology Course. This has been one of the premier field-geology courses in the country since its inception 40 years ago. The best students from the University of Iowa, Illinois, Minnesota, Wisconsin, and Michigan State University attend, and the top students are offered USGS and NAGT internships, in addition to cash awards and scholarships. The inclusion of students from WKU with those from these research universities has raised the profile of the Department, and initiated collaborations with students and faculty alike.

Students assemble for breakfast at 6:30 a.m., are in the field for 10 hours, have dinner and then work on maps for another 2-3 hours each night. Eight different mapping projects located around the Wasatch and Uinta Mountains of Utah involve the identification of minerals, rock types, fossils, folds, faults, weathering and types of alteration, and geomorphological features. Students not only learn to accurately render the three-dimensional geology on their maps, but are also expected to compile complete rock descriptions for each unit, determine all pertinent stratigraphic features, construct detailed stratigraphic sections, evaluate evidence for structural deformation, and compose a thorough geological history for each area. This is truly a rigorous, invigorating field camp experience, synthesizing the entire undergraduate geology curriculum! So far, five geology majors from WKU (Laura DeMott, Amanda Mullen, Patty Chalmers, Adam Smith, and Cody Holbrook) have been able to take advantage of this opportunity and all represented WKU Geology very well.

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Geology Majors Present Research at National Meeting

Two geology majors were selected to participate in paid internships in National Science Foundation research programs this past summer, and another was selected for a paid internship at a new lab at the University of Kentucky.

Brandy Woodcock, a junior from Morgantown, KY, participated in the NSF-funded Research Experiences for Undergraduates program through the Department of Civil Engineering and Geological Sciences at the University of Notre Dame. Woodcock worked with Dr. Susan Sakimoto for eight weeks on a research program focused on modeling geophysical processes in terrestrial volcanism and planetary geology and geophysics. Her work concentrated on calculating lava flow and eruption rates of Syrtis Major Planum on Mars, and correlating these with volcanic construct volumes.

Daniel Hawkins, a junior from Hanson, KY, participated in a 10-week NSF-REU program through the Center for Space and Planetary Sciences at the University of Arkansas-Fayetteville. Hawkins worked with Dr Glen Mattioli, studying volcano morphology, and in particular, the differences in symmetry between different volcano types. The objective is to create a database of volcanoes worldwide for use in the study of the variance in volcanoes due to volcano type and tectonic setting.

Ashley Williams, a geology major from Leitchfield, KY, spent the summer being paid to obtain sta-

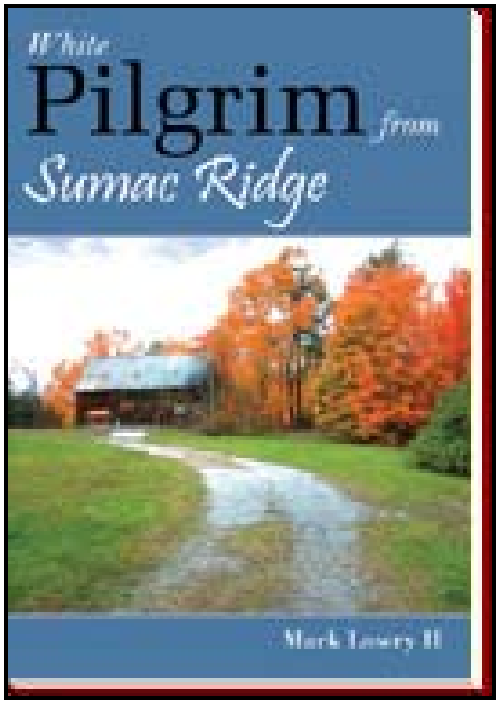
ble isotope compositions in the ERTL (Environmental Research and Technology Laboratory) facilities at the University of Kentucky, under the supervision of Dr Harry Rowe. Her summer experience involved sampling growth layers of speleothems, preparing them for analysis and interpreting the resultant data. Williams was able to obtain initial carbon and oxygen isotope data from four West Virginia stalagmites, which will be applied towards developing paleoclimate models for the region. In addition to running the Mass Spectrometer and ICP for the speleothem samples, Williams was also able to gain experience analyzing shale samples with equipment housed at the Kentucky Geological Survey, including the XRF and Sulfur/ Carbon Analyzer.

All three students not only received invaluable training and experience using state-of-the-art analytical techniques not currently available at WKU, but will also be presenting their research at the national meeting of the Geological Society of America in Salt Lake City! All three plan to continue their research at WKU under the supervision of Dr. Andrew Wulff, in close conjunction with their REU supervisors.

Students in the Field

Emeritus Faculty Publishes Book

Dr Mark Lowry II is a son of the rural Pine Hills of south Mississippi. He graduated from West Point and earned a Ph.D. at Syracuse University, before coming to Western Kentucky University to teach cultural geography. A human geographer and former army colonel, he has published in books, popular magazines, newspapers, and professional journals. The wide-ranging subjects of his published work include the social geography of Mississippi's bi-racial society, ethnic patterns in New York villages, mothers of the Plaza de Mayo in Argentina, Ecuador's Colorado Indians, snow capped volcanic mountains of South America, the life of Moritz Thomsen, fishermen off the coast of Ecuador, challenges and triumphs of a distance runner, and more. He divides his time between southern California and Kentucky, where he lives and works.



History and Activities of the Kentucky Climate Center

Stuart A. Foster
State Climatologist for Kentucky

Historical Context

The Kentucky Climate Center, recognized by the American Association of State Climatologists as the official State Climate Office serving the Commonwealth of Kentucky, brings national prominence to Western Kentucky University through its participation in the National Climate Services Partnership. Across the nation, state climate offices are housed in some of the nation's most prestigious public universities. Within the Midwest Region, Western Kentucky University is joined by the University of Illinois, Michigan State University, the University of Minnesota, the University of Missouri, Ohio State University, Purdue University, and the University of Wisconsin as host sites of state climatologists.

The legacy of the State Climatologist Program in Kentucky can be traced back to 1889 under the United States Weather Bureau. In 1973, a tight budget led the National Oceanic and Atmospheric Administration (NOAA) to discontinue the program. A majority of states, recognizing the inherent value of the program, chose to continue it. In the case of Kentucky, the University of Kentucky, which housed the State Climatologist for Kentucky, chose not to continue the program. Then, under the leadership of Dr Wayne L. Hoffman, the Department of Geography and Geology at Western Kentucky University took the initiative to revive the State Climatologist Program in Kentucky. Western Kentucky University President Dero G. Downing signed a memorandum of agreement with the National Weather Service and the National Climatic Data Center on May 16, 1978, to establish the Kentucky Climate Center. Mr. D. Glen Conner was appointed as the State Climatologist for Kentucky and director of the newly created Kentucky Climate Center. Over the next 20 years, the Kentucky Climate Center developed an outstanding reputation as the provider of climate services to the Commonwealth. In 1998, the Kentucky Climate Center was recognized as one of the founding members of the Applied Research and Technology Program (ARPT) of Distinction in Ogden College. Support from the ARTP has helped the Kentucky Climate Center to increase the variety of opportunities for students to participate in applied research and service projects.

Activities and Accomplishments

- The Kentucky Climate Center (KCC) has acquired and is now running the fifth generation mesoscale meteorology model, MM5, developed at Penn State University and the National Center for Atmospheric Research. The model is used by the National Weather Service in operational forecasting and by researchers in the atmospheric sciences. and is the most widely used model in the field. MM5, written in Fortran, is being run on a Red Hat Linux platform using the Portland Group compiler. Given a set of initial atmospheric and terrain parameters, MM5 can be used to simulate or predict mesoscale atmospheric circulation at a high spatial resolution (up to 1 km). The model is currently being used in the Kentucky Climate Center to support graduate research and will be integrated into the undergraduate meteorology curriculum in the Department of Geography and Geology. Western Kentucky University is the first university in Kentucky to offer students the opportunity work with this advanced model.

- The Kentucky Climate Center has acquired global-scale datasets from the National Centers for Environmental Prediction (NCEP) and the National Center for Atmospheric Research (NCAR) Reanalysis Project. The Reanalysis Project is an effort to develop an observation- and model-based reconstitution of global atmospheric fields, including such parameters as atmospheric pressure, potential evaporation rate, latent and sensible heat flux, temperature, convective and total precipitation rates, and cloud cover, along with several other parameters that are vital components to support climate monitoring and research. The reanalysis data provide global coverage since 1948 and yield valuable information to support research and educa-

tion in the atmospheric sciences.

The Kentucky Climate Center has entered into a formal partnership with the Center for Climatic Research at the University of Delaware to develop and implement a web-based regional environmental monitoring portal. Kentucky is one of the first states to be in the process of implementing this system. The system includes an interface that enables users to access meteorological data ingested on a near-real time basis from National Weather Service (NWS) radar installations and ground reporting stations operated by the NWS and other agencies. Prior to distribution on the Web, data will pass through quality assurance algorithms and radar images will be calibrated to provide more accurate estimates of precipitation amounts. The system will provide access to high-resolution weather data for Kentucky and surrounding environs and will offer opportunities to develop wide-ranging applications relating to extreme weather conditions, flooding, homeland security, forest fires, emergency response, highway conditions, drought monitoring, crop management, and more. The Kentucky Climate Center will engage in collaborative efforts to develop additional applications based on geographic information systems technology.

The Kentucky Climate Center, in conjunction with the College Heights Weather Station, is in the process of installing a NOAAPORT system to ingest satellite-based data streams broadcast by National Environmental Satellite Data and Information Service (NESDIS) and the National Weather Service (NWS). The near-real-time data stream provided through NOAAPORT includes surface atmospheric conditions, upper-air observations, weather forecasts and watch status reports, real-time radar products, gridded atmospheric model data, and a wide variety of other products. These products have wide uses in service, research, and education.

The Kentucky Climate Center has acquired three Campbell Scientific automated weather stations. These stations are being installed as part of the Barren River Area Mesonet to monitor meteorological variables and transfer data in near-real time to be ingested by the Kentucky Climate Center's computer system. Data will be processed by quality assurance algorithms, archived at the Midwestern Regional Climate Center, and incorporated into web-based climate monitoring products offered by the Kentucky Climate Center.

The Kentucky Climate Center operates a precipitation micro-network in partnership with the National Park Service at Mammoth Cave National Park to support education and research in hydrometeorology. The network consists of nine tipping-bucket rain gauges, each connected to a data-logger. Precipitation is recorded at five-minute intervals. This network is supplemented by another six gauges maintained by various state and federal agencies and therefore provides an excellent combined network of 15 gauges to understand small-scale precipitation variability and its impacts on hydrology and the environment. This network has allowed students to get hand-on experience in field-based research activities.

The Kentucky Climate Center initiated a unique metadata archiving method for the cooperative weather observing network. The GeoProfiles Initiative involves applications of geographical information systems software, digital elevation models, aerial photographs, onsite digital photos. GeoProfiles provide valuable information to users about the location and environmental exposure of instruments and their potential impacts on measured meteorological data. Students participating in this project gained hands-on experience in data quality issues and their potential impacts on climatic and meteorological research.

Scientists from the Kentucky Climate Center are also conducting collaborative research with the High Plains Regional Climate Center (HPRCC) and Climate and Bio-atmospheric Science Group (CBAS). Both of these are located within the School of Natural Resource Sciences of the University of Nebraska-Lincoln (UNL). This school is one of the foremost institutions in the world for boundary layer atmospheric research. The collaboration between KCC and UNL resulted in classroom participation of nearly 60 undergraduate and graduate students here at WKU and produced 12 peer-reviewed publications in leading journals of the field and about half-a-dozen presentations in various national and regional meetings.

Over the last three years, the Kentucky Climate Center has also developed a collaborative relationship with the Department of Atmospheric Science of Colorado State University (CSU). This is the leading institution in the world for meso-scale modeling and land-atmosphere interaction. This collaboration between the scientists from KCC and CSU resulted in two high-profile peer-reviewed publications and a forthcoming journal special issue on 20th century land-use change and its impacts on climate. A KCC scientist will serve as a lead guest editor for this journal. Two WKU undergraduates participated in these research activities and will serve as co-authors in several forthcoming peer-reviewed publications. In addition, several presentations were made at various national meetings.

More Changes in the Department!

Drs Kenworthy and Wulff contributed to a successful collaboration with the Departments of Agriculture and Architecture and Manufacturing Sciences that resulted in more than $260,000 for renovations in the EST building. As part of this collaboration, approximately 230 ft^2 was renovated in room 116 to house the rock saws and lapwheels used in all sorts of rock and thin-section preparation. Another area of 200 ft^2 was modified to house laboratory equipment for sediment and soils analysis and to provide ground-level storage of field gear. These new facilities will greatly improve opportunities for student research in the Geography and Geology programs.

This renovation also included new counters/ casework and renovated electrics in room 315 (the old rock-saw room) as the starting point for the development of the room into a Polarized Light Microscopy Facility. The hope is perhaps to sell the naming rights for this facility in order to purchase 15 new microscopes, at least one digital camera, and image capture software to accommodate undergraduate research and innovative labs in earth materials. If you are interested in supporting this new facility, please contact Dr. Keeling!!

Other changes include the reconfiguring of room 326 into a more useful teaching space, and the development of room 339 into a combined Geomorphology and Earth Materials Analysis space to house the magnetic separator, sieves, core tables, wet chemical apparatuses, heavy liquid separation and specific gravity devices, and other equipment necessary for the fundamental examination of earth materials.

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WKU Geoscience Students Win GIS Conference Scholarships

Two Western Kentucky University geoscience graduate students received scholarships to participate in the Twenty-fifth Annual Environmental Systems Research Institute (ESRI) International User Conference in San Diego during the week of July 25-29.

Shwu-Jing Jeng of Taiwan and Narcisa Pricope of Romania were selected from a pool of applicants for the competitive scholarships, which supported 60 graduate and fourth-year undergraduate students from universities and colleges throughout the United States. The scholarships required students to work half-days at the conference while it covered their conference registration, workshops, meals and lodging.

ESRI is the biggest organization and vendor of geographic information systems (GIS) software in the world. Each year, ESRI hosts a conference for GIS users to share ideas and gain knowledge about GIS technology. For this year's event, there were more than 12,000 attendees and 350 sponsors.

This is the fourth year in a row that WKU's Department of Geography and Geology has had a student selected for the scholarship, but this year marks the first time that ESRI has selected two.

"WKU has developed the most integrated GIS program in the Commonwealth," said Geography and Geology Department Head Dr. David Keeling. *"Our students are receiving national and international recognition through scholarships and research in part because of the investment in GIS facilities made by WKU over the past five years."*

For information about GIS, WKU's GIS Certificate Programs and GIS applications in business and industry, contact Kevin Cary, GISP in the Department of Geography and Geology, at (270) 745-2981.

Adventures in Geoscience

Department Group Attends Sustainable Development Conference in Vietnam

By Chris Groves

In September 2004 a group of five from WKU (David Keeling, Chris and Deana Groves, Pat Kambesis, and Debbie Kreitzer, along with alumni Augusto Auler and George Veni) joined about 200 scientists, resource managers, and cavers from nearly 40 countries in Hanoi, Vietnam, for the *First International Transdisciplinary Conference on Sustainable Development of Karst Regions*, sponsored by UNESCO's International Geoscience Program Project 448. The conference was exciting, beneficial for all in attendance, and exceedingly well organized by personnel from Vietnam's Research Institute of Geology and Mineral Resources. Planning for the meeting was undertaken with the support of the government of Belgium and in collaboration with Belgian scientists who have been working in Vietnam in both cave exploration and karst water resource development for more than a decade. A significant effort went into making the meeting truly "transdisciplinary," with talks and discussion by and among traditional karst scientists (hydrologists and geologists, for example), as well as resource managers at all levels, government officials, Geographic Information Systems analysts, social scientists, and cavers. This wide range of perspectives, along with the fact that attendees came from over three dozen countries, added to the fact that the participants were constantly swept with new ideas during the meeting.

For two days before the main conference, the central location at Hanoi's Kim Lein Hotel provided a venue for the annual meeting of the Bureau, or governing board of directors, of the International Union of Speleology. Much of the discussion there focused on planning for next summer's International Congress of Speleology to be held in Athens ,Greece, in August.

The conference itself opened on September 13, 2004, at the Kim Lien Hotel with introductions to a plenary audience by meeting organizers, Vietnam

The Opening Ceremony

ese government officials, and a warm welcome by Belgium's Ambassador to Vietnam. Keynote speeches over a wide range of topics filled the rest of the day, focusing on several United Nations and related karst conservation programs, physical and social science principles that guide both interdisciplinary research and sustainable development in karst, and several papers about ongoing karst research in Vietnam. A highlight for many of the participants was a slideshow by British caver Andy Eavis chronicling his participation in over 25 years of expeditions to Asia, including early visits to China and the great Mulu expeditions in Sarawak, including one survey trip to Clearwater Cave during which over 5.5 kilometers of passages were mapped by one survey team.

The following day was filled with nearly 100 presentations in concurrent sessions, again over a wide range of karst topics from around the world. The information on caving and karst research in Vietnam was especially interesting, as the country has spectacular tower karst in many areas, and yet relatively little information about it has been published in English. After an afternoon poster session, the day ended with a wonderful party hosted by the Belgian ambassador.

A group of about 80 then left very early the next morning for a three-day field trip to several of Vietnam's very fine karst areas, starting out by bus to the harbor at Haiphong on the country's east coast. From there, a high-speed ferry took the group to the

national park of Cat Ba Island in the Gulf of Tonkin, known both for karst landscapes and remarkable biodiversity. Beautiful *fengcong*, or peak-cluster tower karst, covers the island, and the highly complicated geological structure was both beautiful and fascinating to geologists in the group. An especially emotional stop in the late afternoon was a tour of Hospital Cave, aptly named as it served as a hospital for Vietnamese Army officers in the 1960s during the war in Vietnam. A series of concrete-reinforced tunnels led to a large cave room that had served for several years as a movie theater to try to help patients pass the time under very difficult circumstances, and the group listened silently in the dim lighting as the cave guide (a former Vietnamese Army soldier) sang songs that had been used to keep up morale for soldiers during the dark days of war. While, of course, the overall spirit of any such conference is international communication and cooperation, at no time during the week was it more evident than when our guide expressed a hope and wish to all of us for cooperation and friendship between all of the nations represented there.

Surprise Cave

After a night at Cat Ba Town, the group headed out early again for one of the karst trips of a lifetime, the magnificent submerged tower karst of Ha Long Bay, recognized in 1994 as Vietnam's first UNESCO World Heritage Site. A subsiding coastline that became flooded beginning about 40,000 years ago has resulted in a landscape that in ways resembles the famous peak forest karst of southwestern China, but with the bases of the towers and the areas between them flooded by the blue-green waters of Ha Long Bay. Over 1,600 towers, now islands, of various sizes dot the bay and a boat cruise among them is nothing less than magical. The group toured up the coast with stops at a fine swimming beach on Cat Dua (Monkey) Island, Titop Island with a trail to the peak and great 360^{o} views of the bay, and at Sung Sot (Surprising) Cave, surprising indeed that a cave with such large, decorated chambers would be found within a relatively small island. While most of the group finished lunch on Titop Island, a small group led by Pat Kambesis pulled out compasses for an impromptu survey of Titop Cave, which held the island's gift shop and snack bar. The day ended with arrival at Hao Long City, at the north end of the Bay not far from the Chinese border.

Near Cuc Phong National Park

A bus trip of several hours the next morning led to Cuc Phong National Park, one of Vietnam's other great karst-protected areas, which due to the landscape and biodiversity was designated a national park in 1962. Several hikes were offered to destinations within the park, including a steep climb up to Nguoi Xua (Ancient Man) Cave, where an important archeological site, including three graves of three 7,000 year-old former residents of the area, had been discovered by a hunter chasing a wounded monkey into the cave several decades earlier. A few leeches notwithstanding, the park's hikes provided a great opportunity to explore well-developed tropical tower karst and northern Vietnam's thick jungle vegetation. Another fine party outside at the Park's headquarters ended the day, and after a night of heavy thunderstorms, the only rain during the whole week, folks

made their way back to Hanoi, and home.

Not only did the meeting provide a great opportunity to learn about and explore Vietnam's wonderful karst areas, and indeed a country and its culture that most had not seen before, but it was agreed that this was one of the finest meetings that many attendees had participated in. Although the group of about 200 was larger than the organizers had originally expected, the organization was superb.

The "Western" Group in Ha Long Bay, Vietnam

Geology and Culture of Hawaii

By Andrew Wulff

Drs Wulff and Richard Deal co-led a challenging and fun field experience for 15 undergraduates to the islands of Kauai, Oahu, and Hawaii, May 9-20. The group spent four days on Kauai (site of Fantasy Island, Jurassic Park, and many others), hiking along the Na Pali coast by the shores of Hanalei (made famous by "Puff The Magic Dragon"), climbing and hiking through spectacular Waimea Canyon, touring taro, coffee, sugar cane, and guava plantations, visiting old Russian forts, and gazing at exotic flora and fauna (in nature and the National Tropical Botanical Gardens). Students explored lava caves, waterfalls, limestone dunes, one of the wettest places on earth (Wai'ale'ale with an average rainfall of 460 in/year), and ancient engineered fishponds, and sampled poi, loco moko, mahi mahi and lilikoi (all foods!!).

Then – on to the big island, which seemed stark and foreboding with two of the largest volcanoes on earth coalescing to form a very different set of environments. The group explored two more lava caves, green (olivine) and black (basalt and obsidian) sand beaches, petroglyph sites, and ancient temples of human sacrifice and refuge. We hiked up the slope of Mauna Loa (up to 12,700') and on fresh lava to observe flows entering the ocean at sunset, tromped across lava lakes, saw calderas, viewed the Jaggers Museum, experienced acid fogs and the southernmost tip of the U.S., Rainbow Falls, and more loco moko and sweetbreads. In Hilo, we spent the night at a mega hostel in Hilo, which included free pizza and beer provided by the hosts, fragrant orchids, and late-night beach walks, and we paid appropriate homage to the great statue of Chief Kameheamea standing watch over soccer practice in Tsunami Park.

The confluence of geology and culture was quite apparent in places such as Menehune Ditch (Kiki a Ola), where ancient waterworks for irrigation were carved into and under spectacular pillow basalts and columnar jointed lava flows. Hikes around Fort Elisabeth (a remnant of Russian colonialism) ended up on a beach with great olivine crystals, and viewing and discussing tsunami warning towers. We even got in some beach time, including the first body surfing experience for a few! AHHHHHH… Needless to say, the trip was packed with great experiences and students gained a full appreciation for the interaction between culture and natural environment, and why Geography and Geology are such appropriate companion disciplines.

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TSUNAMI DEVASTATION IN THAILAND: SIX MONTHS LATER

By Michael Trapasso

A police patrol boat, approximately a 50-footer, painted military gray, is just sitting there, still in one piece. Except it's not in the Indian Ocean but resting in a field almost a half mile inland from the shore. It

was kind of comical seeing this misplaced boat, but the force that planted it there was not very funny. This is near the Khao Lak Beach Resort in Thailand, one of the areas hit hardest by the tsunami of 26 December 2004. Originating from an earthquake near Sumatra, and measuring 9.0 on the Richter scale, gigantic ocean waves were propelled inland as far as 700m (0.43 miles).

But before I continue to describe the worst-hit area, let me begin farther south, on the island of Phuket, once Thailand's premiere beach resort area. This small island (about 55 km by 25 km) is home to a number of gorgeous beaches on the Indian Ocean coastline. My base of operations was Kata Beach near the southern tip of the island. Miraculously, this beach was untouched by the ocean's anger. It is puzzling how tsunamis will bend around the coastline geography calmly kissing some beaches while violently hammering others close by. At any rate, we (my guide Nick and I) left the pristine Kata Beach and began heading northward, where the destruction grew steadily worse. The first stop was Karon Beach. There geography saved the day! A series of tall sand dunes standing parallel to the shore acted like barriers to the surging ocean waves and kept the damage to a minimum. Farther north, construction crews dig a new canal, which also runs parallel to the shore, in hopes of quickly draining the ocean's next torrents back out to sea. Will it work as planned? Only time and the next tsunami will tell.

Next, we entered the town of Patong and its corresponding beach area. Here, construction crews were hard at work repairing the bottom floors of hotels violated by the furious wave action. It was interesting to see the industrious local merchants who quickly reconstructed their small beachfront shops and stands where the ocean had removed them only 6 months earlier. According to Nick, the locals were back up and selling their souvenirs and snacks almost immediately after the disaster. Ah, 'free enterprise' has a life of its own. It was here that I saw my first in a series of new warning sirens. Thailand is the first country, of those affected by the disaster, to install the new Tsunami Warning System. These state-of-the-art sirens sit atop major hotels, on the beaches themselves, and on small islands offshore.

In the town of Patong, work crews were laboring feverishly to rebuilt housing for the many displaced people. A group of students from the Phuket Technical College joined the work crews. I was told that a group of students from a Canadian technical college was due to arrive soon and take part in the reconstruction. What better way to do an internship?

Wreckage from the Tsunami

As we drove northward, it comforted me to see Red Cross signs posted at various sites. It was nice to know my donation money was well spent. Reaching Kamala Beach, the devastation was similar to that at Patong. Residential neighborhoods were being rebuilt. My only comfort at seeing a destroyed school building was knowing that the tsunami hit on a Sunday and school had not been in session. The last beach we visited on Phuket Island was Naithon Beach. This is a rather quiet area with no hotels on the beachfront, therefore most of the ocean's wrath took place amid the local vegetation … many torn and uprooted trees.

From there, the main road took us away from the coast and toward the Sarasin Bridge, which crossed the strait between Phuket Island and the Thai mainland. On the way to Khao Lak, we stopped at the "Wall of Remembrance" erected in honor of the Thai and foreign victims of this catastrophe. Two parallel white walls, about 3m high, stood with small national flags posted at equal intervals along the tops. Over 50 countries mourned their lost souls; I quickly learned that this was a favored vacation spot among Scandinavian people. On the same grounds is the Thai Tsunami Victim Identification Site #2. This is where they are still conducting DNA tests on the unidentified bodies. There are about 1500 of those. Khao Lak alone

claimed over 2700 recovered bodies, with an unknown number of people missing. Thailand as a whole counted over 5300 dead, over 8400 injured, and an unknown number of missing.

The last stop was the Khao Lak Beach Resort Area, and the smile on my face over the 'patrol boat in the field' quickly faded as we drove along the streets that once crisscrossed this large complex of luxury hotels. "Oh my God!" I said over and over as I saw what the tsunami had left behind. It reminded me of photos I had seen of the aftermath of the Hiroshima and Nagasaki atomic explosions. For my former students … it was as if an F5 tornado had slowly strolled up and down the lanes. There were small construction crews working here and there, but they were only using the remnant foundations of some of the hotels to brick-in small apartments. This was an effort to house the many displaced locals. To rebuild those hotels, massive work crews, bulldozers, dump trucks, and giant cranes are needed, but there were none to be found. No one knows for sure if those giant hotels will ever be rebuilt.

A different kind of reality came to me as I walked through some of the actual hotel rooms and suites and saw the mattresses, furniture, and luggage strewn about where the waves had kicked them. T-shirts, sandals, and all types of personal effects were plastered about. I'm not an emotional sort of guy, but I was especially touched when I spotted a little girl's shoe. It was pink with rhinestones and a little ankle strap. Next to it, lay a little plastic cup decorated with balloons, the type of cup a little girl would like to drink from. Who was she? Was she a nice little girl? Was she pretty? I guess that really doesn't matter any more. Emotionally exhausted, I told Nick that I'd had enough; it was late in the day and time to return to my hotel. My first foray was over.

The Thai people, as I found them, were all very gracious and very hospitable. They have all pulled together to help each other through this version of hell, and I have no doubt they will eventually recover from this natural cataclysm. But it's going to take a lot of time. I was quite encouraged on my second trip to Patong town when I spotted the shell of a building with a tin roof and a few picnic tables underneath. Posted on an upright support beam was a hand-painted sign, which said, "Bob's Bar." That sign gave me a chuckle. "That's the spirit Bob!" I thought, "Never say die!"

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STUDY ABROAD ADVENTURES IN CHILE AND ARGENTINA

By Debbie Kreitzer

The 2005 summer study-abroad trip to Chile and Argentina proved to be one of the best trips so far. David Keeling, Will Blackburn, and Debbie Kreitzer were the instructors for this adventure. For 28 days they and 12 students explored northern Chile and northwestern Argentina.

The group flew into Santiago, Chile, and immediately rented a couple of 12-passenger Kia vans. These vans became old and trusted friends throughout the next month. The students even named them -- Dr Keeling drove the Golden Goose and Will Blackburn drove the Silver Bullet. In these two vans the group drove to the coast, spending the first night in Viña del Mar, a vacation spot of sorts for Chileans. The next few days were spent driving up the coast of Chile. The scenery on these drives was as spectacular as driving Highway One in California! The group stayed in several different locations including Ovalle, Vallenar, Bahía Inglesa, and Taltal. In Taltal, during an impromptu gathering, the group was able to meet the mayor and other city officials. Dr Keeling was even promoted to mayor for the evening! They all learned a little about Chilean culture and politics that night.

The next stop was Antofagasta. Here students learned about the economic activity and physical geography of the area. Historically, the main economic activity in the area was nitrate mining. Antofagasta is a port city and the nitrates were routinely shipped from there. Today the port is used mainly to ship copper from mines in the Atacama desert region. Some of the students visited a school that teaches English and spent the afternoon answering questions about the United States while learning more about Chilean culture.

The vans were then turned inland and the group drove to the heart of the Atacama desert, where students explored the driest region of the world. The group spent two nights in Calama, the center of the mining industry in northern Chile, and then moved to

San Pedro de Atacama. San Pedro sits at about 8,000 feet above sea level and is surrounded by the high Andes mountains. There are many active and extinct volcanoes located within viewing distance. This predominately adobe town is located on an oasis, and functions mainly as a tourist center. It is very charming and filled with youth hostiles, restaurants, and tour offices. The students were able to participate in a variety of activities in this region, from exploring pre-Incan ruins to horseback riding through the Valley of Death. They also quickly learned that Chile still has many infrastructure problems, as the pipes at the hotel froze every night and the group awoke each morning to either no hot water or no water at all.

After about a week in the desert the group left Chile for Argentina. The only road to Argentina in this region was over the Jama Pass. This pass is newly paved on the Chilean side and *almost* completely paved on the Argentine side. Official sources say that the highest point on the pass is about 14,000 feet above sea level, but our GPS units recorded 15,900 feet in altitude (give or take 50 feet). Most of the group had some symptoms of altitude sickness, but no one had serious trouble. The vans, however, struggled with the crossing and, on the Argentine side, one ran out of fuel. This proved to be only a minor inconvenience, since the nearest gas station fortunately was only about seven miles away.

Salta was their next destination. Most of the group agreed that this was their favorite city. Salta is a city known for its beautiful colonial buildings. The downtown area is especially beautiful. Students had the opportunity to explore the city, go white-water rafting in the moonlight, and go horseback riding again.

After four nights in Salta, the group traveled to Mendoza, stopping in Santa Maria and San Juan along the way to visit the Quilmes per-Colombian fort, and several wineries. In Mendoza, the group was able to visit another winery and tour the city, learning about the culture of the area. They were also able to drive into the Andes and go skiing at Los Penitentes. Several in the group were accomplished skiers, but everyone gave it a try and there were no broken bones!

The group then headed back to Chile, this time through the Paso Libertadores (a much more traveled route than the Jama Pass). The students had a couple of free days to explore the cosmopolitan city of Santiago, and then they headed back to the States. Some of the comments from the students included: "I learned more than I ever imagined!" "Learning on the road is so much better than the classroom." "This summer's Study Abroad in South America was an unforgettable experience to say the least." "The lessons and experiences I incurred during this class will be cherished forever."

The group in The Valley of the Moon, Atacama, Chile

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Eine Lagerstätten!

By Michael May

Over Spring break this past March, while I was measuring and studying Mississippian (Chesterian) strata in Warren County and Butler County, north of Bowling Green, my sons, Kevin (10) and Peter (12), discovered some well-preserved crinoids atop an outcrop of limestones with interbedded shales. The outcrop had been visited before but the kids trekked to the top where eyes had never been cast previously and they helped to uncover and retrieve what turned out to be museum-quality specimens of invertebrate creatures of the Chesterian Seas some 330 million years old.

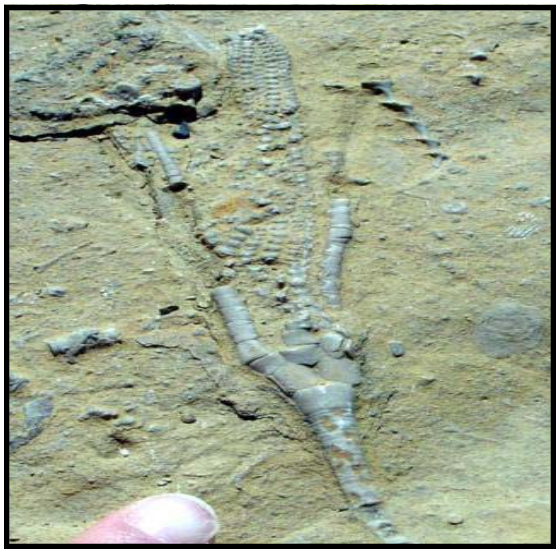
Budding Fossil Hounds, Kevin and Peter May

The boys were quite proud of finding the crinoids and, with the help of Dr N. Gary Lane at Indiana University, the prize specimen of nearly 30-inches long was identified as a Chesterian form called *Blothocrinidae Culmincrinus* (only partially exposed as upon discovery as seen in the picture with Kevin and Peter). Another spectacular find included a starfish (an asteroidean). Such biota like starfish are generally difficult to preserve well in the fossil record. Likewise, preservation of such complete crinoids possessing fully articulated rootlets or holdfasts, stems or columns, and heads or a calyx are also unusual. Crawfordsville, Indiana is perhaps the most famous site for such crinoids and most of these sell for hundreds dollars a piece! It can be assumed that conditions at this location were just right for great preservation of these creatures. Additionally, there are at least eight different taxa of crinoids tentatively identified from the site including *Phanocrinus*, *Taxocrinus* (a flexible crinoid), *Zeacrinites (wortheni?)*, *Aphelecrinidae (Apheloecrinus or Cosmetocrinus)*, *Thalocrinus*, *Batocrinidae-Camerata Globocrinus unionensis*, *Pterotocrinus*, and an Inadunate crinoid.

Crinoids have been written about by paleontologists in the *Treatise of Invertebrate Paleontology* as some of the strangest marine invertebrate animals or, for that matter, some of the strangest animals to ever exist on the planet. There are crinoids living in some of today's seas but the recovered specimens from this site represent extinct species. These critters had their mouth near their "outgoing plumbing" within the branching head (termed the calyx). The arms in the calyx helped move food in toward the mouth. It turns out that the anal sacs (some specimens have three of these!) are great locations for gastropods (snails) to hang on for consuming "left overs" or excrement of the crinoids. These gastropods of the family Platyceratidae were identified in several of the specimens adjacent to the anal sacs. This gives a new meaning to "bottom dwellers" and is kind of an interesting mutualistic relationship for sure, a Mississippian recycling program if you will.

Asteroidean

Such well-preserved seafloors or other fossil beds are referred to as Lagerstätten or simply put, a deposit if one is speaking geologically. The literal German term means a resting place. The eventual resting place for some of these fossils will be in some glass cases in the Department for all to enjoy. So come by and take a look sometime!



FACULTY ACTIVITIES

KATIE ALGEO taught a mix of cultural geography and GIS during the 2004-2005 academic year, including Principles of Human Geography, Geography of Food and Agriculture, GIS Analysis and Modeling, and Cultural Geography. One of the projects that students did in Cultural Geography entailed applying critical analysis to the social construction of identity in the popular film *Bend It Like Beckham*, which features a Sikh family living in London. This classroom exercise evolved into a research project on film pedagogy that was the subject of two conference presentations and a paper submitted for publication to a peer-reviewed journal.

Over the winter break, Katie traveled to Pasadena, California, to continue her research in the Huntington Library, which contains an outstanding collection of early American historical documents. Of particular interest is the Janin Family Collection, a treasure trove of papers from the family that owned and managed Mammoth Cave before its conversion to a national park. This research trip was part of a continuing project to document and interpret the historical geography of tourism to Mammoth Cave.

Some of that work may bear fruit next summer in the form of workshops for community college faculty to be taught at Mammoth Cave. Along with Co-Principal Investigators Dr Rick Toomey (the new director of the Mammoth Cave International Center for Science and Learning) and Dr Darlene Applegate (Folk Studies and Anthropology), Katie submitted a major grant to the National Endowment for the Humanities to fund two week-long workshops on 11,000 Years of Culture History at Mammoth Cave.

Katie has a book chapter expected out in August in *Rural Change and Sustainability: Agriculture, the Environment and Communities,* which is edited by Stephen J. Essex et al. Her chapter is entitled "Mammoth Cave National Park and Rural Economic Development." In other publications, Katie wrote a book review of "Appalachian Folkways" by John B. Rehder for *Southeastern Geographer* and researched and wrote a narrative for a historical walking tour of Scottsville, Kentucky. The latter will be coming out in brochure form later in the year and is part of the Heart of Scottsville Main Street revitalization program.

Since much of Katie's research deals with cave tourism, she decided it was time for some phenomenological research (i.e. experiencing the cave phenomenon herself), and in June she attended the week-long course on the History of Exploration at Mammoth Cave taught by long-time caver Dr. Stan Sides for the Center for Cave and Karst. The photo below captures the class on a lengthy trek to the Bedquilt entrance to Mammoth Cave. Also taking the course and visible in the photo to Katie's left was geography undergraduate Karen Curry.

JOHN ALL has had a busy year as his research has taken him from Kentucky's caves to the Himalayas and he has taught several new courses. His new course on global climate change was part of the inspiration for an article in the May issue of WKU's *echo* Magazine entitled 'Coming Soon to a

Planet Near You.' (http://www.wku.edu/echo/archive/2005may/stories/comingsoon.htm). Dr. All's teaching and travels were also featured in the 2004 *Talisman* – WKU's yearbook for those who graduated during its hiatus – in an article entitled 'A Man Who's Done It All', (as if John hasn't heard THAT one before). In addition to the global change class, Dr All also created and taught a new environmental ethics course to replace PHIL 320 that had been required for the Environmental Management track. The Environmental Ethics course was based upon a graduate certificate program at the University of Georgia's Institute of Ecology. John also taught his normal load of Environmental Planning, Natural Resource Management, independent research and, of course, World Regional Geography. As part of Dr All's supervised internship program – the Central Kentucky Cave Survey - some of the department's student were able to use cave maps to save a coonhound trapped in a cave in Butler county.

Financially, this was a very good year. John received funds from the National Science Foundation (NSF) and the WKU Office of Sponsored Programs to examine the impacts of climate variability on agricultural and forests in Chile and he will be traveling there with a graduate student in the coming year. Working with Chris Groves, Dr All was awarded money to visit Thailand and Bhutan (more on the trip below), which resulted in the submission of a 5-year grant application to the NSF. Locally, Dr All received funds from Warren County to create a digital groundwater elevation map based on data from the Center for Cave and Karst Studies. The money was used to provide employment for an undergraduate student.

Dr All's research was published in *Geocarto International* and was accepted for publication in *Environmental Management*. He made several conference presentations including in Denver, Colorado, at the Association of American Geographer's (AAG) annual meeting and in Washington D.C. at the American Association for the Advancement of Science (AAAS) annual meeting. Dr. All is currently serving on the AAAS Geology and Geography National Committee. He has proposed a symposium for the 2006 AAAS meeting on the impact of climate variability and change on the world's mountain regions.

In November, Dr All traveled to Bhutan representing the Hoffman Institute with funding from the WKU Office of Sponsored Programs. While in this isolated country he visited government officials to set up research collaborations and explored a recently reported cave in the southern Himalayas. This trip should lead to research in these mountain caves and on vegetative responses to climate changes in mountainous regions. Bhutan is a difficult country to visit (there is only one jet plane in the country!) and the major gateway is via Bangkok. While in Thailand, Dr All went to a karst region in the southern province of Krabi and visited caves and karst towers. He also spent a day at Railai Beach – a world-famous rock-climbing destination. From the top of a 150-foot pillar of rock, John noticed that none of the village structures was more than ten feet above sea level and he wondered what happened during very high tides. You can imagine his chagrin when two weeks after he returned to the US, the area was washed out to sea by the tsunami that devastated S.E. Asia. While the number of people killed in the area was lower than elsewhere, it is sobering to realize that some of the people Dr All climbed and laughed with are now dead or homeless. While the initial reports were disquieting, it is good to see how the world has positively responded to the disaster.

Locally, John was elected Vice-Chairman of the University Senate and his new responsibilities should keep him very busy. At the final Senate meeting before summer break, John sponsored a motion to protect and insure students and faculty from tort liability in off-campus activities including study abroad. The motion passed unanimously.

Finally, John's son Nathaniel Oakes is just about to turn two. He runs everywhere, climbs like a monkey, and it is impossible to keep him out of trouble. He carries on conversations with anyone who will listen. Unfortunately, they are in a

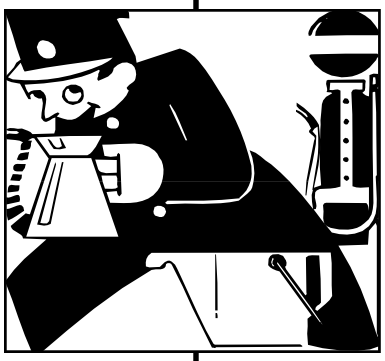
language that only Nathaniel understands. This has been a great year and John looks forward to a busier but even more rewarding one next year.

JAMES BINGHAM writes FORTY AND STILL "STOMPING!"

The first thing that Jim wants to mention is that he will retire from full-time teaching at the end of the 2006-07 academic year. His "heart" is willing to continue but the "body" is starting to wear out. In addition to the health issues of sciatica and congestive heart failure, Jim is now diabetic. He hopes to be able to teach part time for a few years if his health allows. Like a lot of folks, if Jim had known that he was going to live this long, he would have taken better care of himself!

DOES ANYONE REMEMBER THE FROG?

Jim's courses for the past year included Human Geography, Economic Geography, Geography of the U. S. and Canada, and Geography of Kentucky. Recently, he has taught both on campus and at WKU's Glasgow Center.



He continues to have several research interests, including:

1. Food Deserts: Do They Exist in Kentucky?
2. The Impact of Wal-Mart on the Retail Structure of Small Town Kentucky.
3. Free Blacks and Agricultural Communities in Western Tennessee in the 1800s.
4. The Role of River Landings in the Early Economic Development of the Lower Tennessee River Valley.
5. Field Peas and Cornbread: A Spatial Analysis of Southern Comfort Food.
6. Fried Pies and Cobblers: Regional Variations in the South.
7. The Role of Migration in Kentucky's Recent Population Growth.
8. The Economic Impact of "Drawing" in Kentucky.

If any of you who have, or know anyone who has, a favorite, different, odd, or unusual fried pie, cobbler, or cornbread recipe that they are willing to share, would you please send Jim a copy of the recipe and as much information about the recipe as you can. He will be happy to include these in his research which he hopes will lead to food or cookbook publications with a friend who is Martha White's public-relations director.

In next year's GEOGRAM, Jim will make an effort to include some "stories" about the Department and some of its former and current members--the names are not likely to be changed to protect the "innocent" or "guilty!"

PLEASE COME TO SEE US AT HOMECOMING AND REMEMBER WESTERN CELEBRATES ITS 100TH ANNIVERSARY IN 1906 !

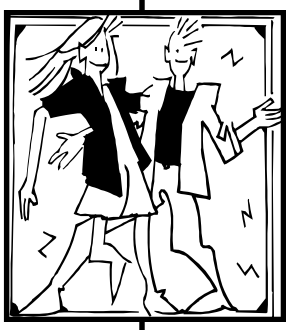
DR. "TINK", KEEP ON ROLLING WITH THE FLOW !

WILL BLACKBURN continued covering the offered geography classes at the Glasgow campus during the 2004-05 year. The new excitement for geography at the Glasgow campus centers on the offering of a Geography Major, which can now be accomplished entirely at the Glasgow facility. Students now have the option to earn a geography degree without a commute to Bowling Green. This has several implications regarding the staffing at Glasgow. While Will continues to teach the courses he has covered in the past, now other faculty will join him to make the degree complete. The courses are offered on a rotating schedule, and the students will be able to earn a degree within an acceptable timeframe. As other faculty members go to the Glasgow campus to make the degree possible, Will returns to the Bowling Green campus for part of his teaching load. This rotation will expose the students to the outstanding faculty of the Department and provide them with the same excellent, well-rounded geographic education that students at the Bowling Green campus receive. Will is certainly looking forward to the continuation of his work with potential Geographers, as advisor, teacher, and mentor.

Over the past year, Will attended several Quality Enhancement Program workshops. These he attended as a representative of both the Department

and the Glasgow faculty. Will is committed to improving the quality of education offered at Western and continually looks for methods to better engage the students to increase and ensure their success in our global society. Engaging students and providing the means by which students can participate in more than just the academic classroom setting is critical in the education process. Will recognizes the importance for the students to feel a sense of community and collegiate responsibility and he continues to strive to find examples that emphasize that importance to the students.

Will had the opportunity to participate in the study-abroad program again this year. Dr David Keeling, Debbie Kreitzer, and Will traveled with a group of students through Chile and Argentina. Will is now part of the exclusive club of North Americans that have driven both the Jama Pass from Chile to Argentina and the Paso Libertadores from Chile to Argentina. The trip was a complete success and there were no major reported injuries to students or staff. It is not just the students that learn on these trips, the instructors come away from the experiences with first-hand insights to share with students in the classroom. Will knows these experiences make him a more qualified teacher, and he expresses his gratitude for the chance to participate.



Will is currently preparing for what promises to be an excellent academic year. Go Western!

KEVIN CARY has very much enjoyed his past year with the Department and is looking forward to his fourth. He continues to strengthen WKU's GIS program with the continuing efforts of the GIS committee. This academic year, the Department is introducing a GIS Minor and a Graduate Certificate in GIScience. He is also collaborating with Dr Warren Campbell of the Engineering Department to develop a course titled GIS for Engineers (GEOG 318), which they are both looking forward to teaching in the Spring 2006 semester.

This past winter, Kevin became a certified GIS professional (GISP), one of a few in the in the Commonwealth. This certification is still new, with only 802 certified GIS professionals worldwide as of August 2005. The professional certification was initiated last year by the Urban and Regional Information Systems Association (URISA) and is now managed by the newly created GIS Certification Institute in Park Ridge, Illinois (www.gisci.org). The professional certification in GIS was developed to identify GIS professionals with accreditation denoted by GISP and to establish and maintain high standards in practice and ethical conduct set by the institute. Every five years, the professional certification has to be renewed. To receive the professional certification in GIS, applicants must receive a minimum amount of points in each of the following three areas: education, professional experience, and contributions to the profession.

As the GIS Director, Kevin continues to develop the Center for GIS by taking on GIS projects and expanding its capabilities. The Center is currently digitizing WKU's telephone wires, underground and above, and getting ready to bring its GIS server online. Shwu-Jing Jeng and Shawn Simpson, both graduate assistants in the Center for GIS, are preparing to share that challenge with Kevin. The GIS server will allow them to create dynamic maps, which are viewable through any Internet browser, distribute geospatial data over a network to any desktop GIS, and provide more opportunities to the Center for GIS in GIServices.

Check out the Center for GIS online at www.wku.edu/gis!

MARGARET CROWDER has had a busy and exciting year! Fall 2004 brought with it a full load of GEOL 102 classes and another opportunity to teach a Super Saturdays class through the Center for Gifted Studies at Western. In the Super Saturdays program, about fifteen 4th and 5th grade students actively learned about geological processes while writing, producing, and starring in their own Hollywood-style Geology-based movie. Margaret has plans to teach another Super Saturdays course in Fall '05, so if you know of a

child who would like to participate, make sure you sign them up!

Spring '05 was a hectic semester, indeed, with more introductory Geology courses, a repeat offering of the online course for science educators (co-taught with Dr Siewers) and another class of Oceanography. Margaret's Oceanography students participated in two major projects for the semester – one was a problem-based learning style report based on the disastrous tsunami in December. The second project was a classroom debate on global warming, with students taking the side of one of three groups: the US government, Kyoto Protocol ratifying countries, or IPCC scientists. Both projects worked wonderfully to engage the students in higher learning processes (and the debate was especially exciting)!

Margaret has stayed on her toes over the summer as well, with trips to Chicago, Minneapolis, Atlanta, Seattle, and Milwaukee. In Minneapolis, she made a presentation on problem-based learning (co-authored with Dr Siewers) at the North Central Section GSA meeting. Once in Seattle, Margaret almost decided not to return (she says the scenery and the live music scene were both awe-inspiring!) and had an amazing time participating in a cutting-edge workshop on Oceanography. She also took some time to see the sights with visits to Mt. Rainier and Mt. St. Helens. While in Atlanta, Margaret was able to finally take some time to go to the top of Stone Mountain. Atlanta, Chicago, and Milwaukee all afforded Margaret opportunities to indulge in one of her favorite pastimes – watching major league baseball! Her highlight of the baseball experience this year was third row bullpen seats at Wrigley!

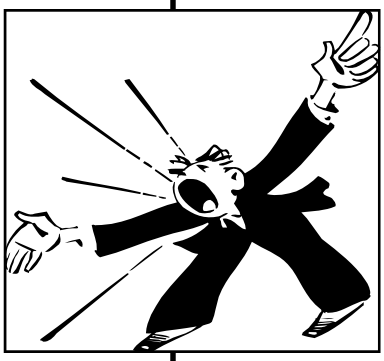
SCOTT DOBLER has completed his fifth year at Western Kentucky University. This past year he presented a paper at the Kentucky Academy of Science that addressed alternative ways to engage the primary and secondary student with geoscience. He also presented at the Kentucky Council for Social Studies Teachers. Student engagement was also a theme at this meeting. Scott's continuing research interests will address how Kentucky college and university geoscience programs are preparing P-12 students for their future.

In order to concentrate on this endeavor, he has teamed up with a geography special-interest group. This group of geographers will concentrate on the efforts of the Kentucky Geographic Alliance, which is already established with National Geographic Education Foundation. The website: http://www.ngsednet.org/kentucky will offer a multitude of options for educators, public and private interests. If you are interested in geographic literacy, or geographic education Scott would be interested in talking to you.

STUART FOSTER enjoyed a productive 17th year at Western. Dr. Foster was heavily involved in service and outreach activities in his role as state climatologist. He delivered a featured presentation titled *Hazards in the Barren River Area* at the Barren River Area Development District's Hazard Mitigation Kick-off Meeting in Bowling Green on August 26, 2004, and then provided consulting services for development of a community and regional hazard mitigation plan. Dr Foster was an invited speaker at the Customer Partner Workshop hosted by the National Weather Service Forecast Office in Jackson and held at Natural Bridge State Resort Park on October 19, 2004. The following month he was a guest speaker at the Climate Extravaganza hosted by the National Weather Service Forecast Office in Paducah on November 4, 2004. This past spring, Dr Foster organized and hosted the Kentucky Climate

Center's 1st Climate Services Symposium, a two-day meeting on May 15th & 16th attended by scientists and professionals from around Kentucky and the nation. Topics included the delivery of climate services, environmental monitoring systems, and drought policy, assessment, and monitoring. Finally, Dr Foster was invited to contribute a section on weather and climate for the premier edition of Clark's Kentucky Almanac 2006 that is slated for wide distribution in Kentucky this fall.

CHRIS GROVES and his students had an especially productive year, making progress on old projects and establishing new ones. In September 2004 Chris and Deana traveled with David Keeling, Debbie Kreitzer, and Pat Kambesis to Hanoi, Vietnam, for the First International Transdisciplinary Conference on Sustainable Development of Karst Regions, attended by karst scientists and resource managers from some 40 countries. Chris opened the conference with an invited keynote talk titled *Recent United Nations' Efforts for the Global Study and Protection of Karst Resources.* After two days of meetings, the group enjoyed a three-day trip to some of northern Vietnam's wonderful karst areas.



The Hoffman Institute's China program continued projects aimed at helping to enhance the quality of life for residents of southwest China's vast karst region, home to 80 million people, about 10% of whom live below the Chinese poverty level of 800 *yuan*, or about $100, per year. These challenges are exacerbated by karst-related environmental problems. At the invitation of the local government there, in late 2004 Chris traveled to the area of Wanhuayan, or Ten Thousand Flowers Cave, in eastern Hunan Province to meet with scientists and officials to plan the next WKU expedition. This took place in March, 2005, led by Pat Kambesis and joined by a group that included Geoscience grad students Ben Tobin, Andrea Croskrey, and Johanna Kovarik. The objective was to explore and map new areas of this beautiful tourist cave, and to produce a high-quality map of the cave system. The team completed several dye traces from nearby caves. This information, along with photos made by the team, will be included in a joint Chinese-US produced book on the cave system, which, along with augmentation of the cave tours, is designed to aid economic development in the area with increased sustainable tourism.

In February, Chris and Deana traveled to Paris, France, and the headquarters of the United Nations Educational, Scientific, and Cultural Organization (UNESCO) to attend the annual meeting of the International Geoscience Program. There, the proposed five-year project *Global Study of Karst Aquifers and Water Resources* was accepted, and will be led by Chris along with co-leaders Yuan Daoxian (China), Heather Viles (England), and Bartólome Andreo-Novarro (Spain).

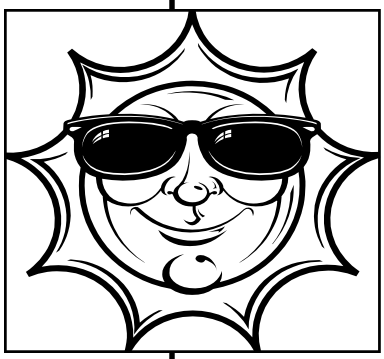
Otherwise the Hoffman Institute continued to focus on student activities, with undergraduate and graduate students participating in a variety of research projects, field trips, and conferences. Other than in China, this research has been associated with projects at Mammoth Cave, Alaska's Tongass National Forest, and a new USDA collaboration at Cave Spring Caverns in northern Warren County. Students have attended and given presentations at the annual meeting of the National Speleological Society in Michigan, the first *Kentucky Friends of Karst* conference, *Posters at the Capitol* in Frankfort, the SE Regional Geological Society of America Meeting in Mississippi, the Kentucky Academy of Science, and the WKU Sigma Xi Student research Conference.

With Deana's new faculty position at the WKU library, she and Chris have expanded their professional collaborations with several joint conference presentations about their efforts in China, and a talk (also coauthored with Weldon Hawkins) titled *A Century of Linkages and Synergy: Western Kentucky University and the Mammoth Cave System* that Deana will present at a summer 2005 conference in Greece. Of course, their biggest project this year has been their little daughter Lillian.

DAVID J. KEELING reports that his twelfth year in the Department, and fourth as Department Head, generated challenges, excitement, some great international trips, several informative conferences, a

great experimental class, and hard-working students to keep him extremely busy.

Travel remains at the center of Dr Keeling's professional and personal life, and over the course of the past year he again enjoyed some fabulous research and lecture trips to the four corners of the planet. In September, 2004, Dr Keeling joined colleagues from the Department on a visit to Hanoi, Vietnam, where he presented a research poster with Debbie Kreitzer on the Biosphere Reserve and local community development. The international conference included field trips to Halong Bay and two other wonderful locations in northeast Vietnam. November found him winging across the Atlantic for a week in Umbria, examining local transportation networks, small town development, and wine production around the Tiber Valley. In December and January, Keeling led an AGS eco-expedition, circumnavigating the planet in 23 days, visiting 6 continents, 10 countries, and traveling over 35,000 miles. On the expedition, he lectured about the Inca in Peru, addressed global climate change in the Pacific, discussed nationalism and ethnic identity in Bhutan, and focused on sustainable development in Tanzania.



In May 2005, Dr Keeling headed across the Atlantic once again, this time to Athens and Santorini in Greece for research on European Union regional development issues. In between all of the international trips, Dr Keeling managed several flying visits to San Diego, New York, Denver, Portland (OR), Seattle, Athens (OH), West Point, and Charleston (SC) for a variety of meetings, conferences, lectures, and personal activities.

David participated in several conferences and workshops during the year. In October, 2004, he gave a paper titled *Paving Patagonia: A Development Dilemma* at the Conference of the East Lakes Division of the AAG, in Athens, Ohio. In April, Dr Keeling presented *Land-Use Planning in a Karst-Biosphere Reserve Environment* with Debbie Kreitzer at the Annual Conference of the Association of American Geographers in Denver, Colorado.

Within the community and on campus, Dr. Keeling gave several talks on issues ranging from development in South Korea and Vietnam, to Australia and U.S. foreign policy around the world. He appeared several times on WKYU-FM's Midday Edition, published Op Eds and commentaries in newspapers around the country on a variety of topics, gave a presentation on Australia at Barnes and Noble, and contributed lectures to a number of departmental courses. Dr Keeling continues 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 attended way too many meetings, but during the year he contributed to the ongoing development of the Leadership Studies program (www.wku.edu/leadership) and to International Education (www.wku.edu/iec) on campus. Department Head duties have severely restricted his ability to write and publish research, but during the past year Dr. Keeling had a peer-reviewed paper titled "Latin American Development and the Globalization Imperative: New Directions, Familiar Crises," published in the *Journal of Latin American Geography,* Vol 3(1). A chapter titled *Waterfront Redevelopment and the Puerto Madero Project in Buenos Aires, Argentina* will appear in *Cities and Urbanism in Latin America* later this year, published by the Universitat Jaume I in Valencia, Spain. He also made sporadic progress on his book *Geography Rocks!,* a geographical analysis of the development and change of popular music in American society, and wrote a commentary titled "Exploration and Discovery—Now More Than Ever" for The American Geographical Society.

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://www.wku.edu/~david.keeling/index.htm.

STEVE KENWORTHY writes that the last year was a busy and productive one, filled with a range of research activities related to stream hydrology, soil erosion, and suspended sediment transport in the Upper Green River and its tributaries upstream of Mammoth Cave National Park. Dr Kenworthy and his student researchers have been busy collecting streambed sediment samples, compiling data on watershed characteristics, and installing new equipment for monitoring water and sediment fluxes at sites on Pitman Creek (Green County) and Logsdon River, a major stream in Mammoth Cave. Most recently, they have been working with a team from the Biology Department, headed by Dr Scott Grubbs, on a survey of aquatic macroinvertebrate habitat along the Green River. The hot and dry summer of 2005 has been a mixed blessing for field work, but the near-record low water levels are worth the hot days in the sun!

During the academic year, Dr Kenworthy presented work at professional conferences in Lexington, San Francisco, and New Orleans. Steve also participated in a US Geological Survey field course on sediment data-collection techniques in Castle Rock, WA, near Mt. St. Helens. He also visited the sediment laboratory at the USGS Cascades Volcano Observatory in Portland, OR, bringing home lots of good ideas for doing fluvial sediment work on the Green River in Kentucky. This Spring Dr Kenworthy was selected as a participant in a National Science Foundation workshop for Early Career Faculty in the Geosciences, held in June in Williamsburg, VA, at the College of William and Mary. The workshop was a fantastic opportunity to meet other new faculty in geography and geology and exchange ideas about teaching and research. Steve returned with new perspectives on teaching and learning in the geosciences, and he is looking forward to using these insights to improve his courses and the quality of the Geography and Geology programs at Western.

2005 has been busy at home as well, as Steve and spouse Renae Speck bought a home in Bowling Green near campus. Renae and Steve and their cats love the new home and the five-minute commute, but now they are always busy with improvement projects! If only they could teach the cats how to paint….

DEBRA KREITZER spent a very productive year teaching, researching, traveling, and planning new geographical experiences. In September 2004 she traveled to Vietnam along with David Keeling, Chris Groves, and Pat Kambesis to the first International Transdisciplinary Conference on Sustainable Development in Karst Regions. This conference was very refreshing as it included scholars from several different disciplines presenting and discussing karst-related issues from myriad viewpoints. The meeting was held in Hanoi, but Debbie, along with many participants, also enjoyed a field trip that included a visit to Cat Ba Island, an incredible cruise on Halong Bay, and a visit to Cuc Phong National Park. Although they mainly focused on the spectacular karst landscape in northern Vietnam, the geographers on the trip also observed other phenomenon including how the introduction of capitalism is affecting the Vietnamese economy, the lack of infrastructure in the country, and air pollution problems in Hanoi.

Debbie also attended the Association of American Geographers (AAG) Annual Meeting in Denver, CO, and presented a poster in conjunction with David Keeling. While in the Denver area, Debbie, along with a couple of colleagues, visited Rocky Mountain National Park and the vicinity.

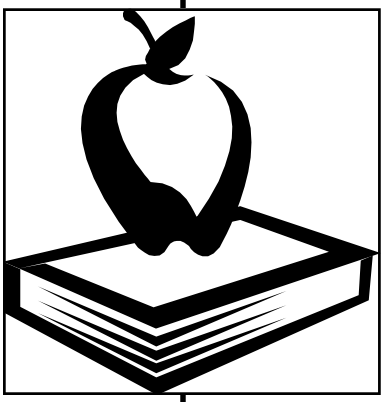
The summer study-abroad trip, which Debbie helped to coordinate long with David Keeling and Will Blackburn, went to Argentina and Chile. For 28 days, twelve students explored northern Chile and northwestern Argentina. In two vans the group drove up the coast of Chile staying in several different locations including Viña del Mar, Ovalle, and Antofagasta. In these places they learned about the economic activity, agriculture, culture, history and physical geography of the area. They then turned the vans inland and drove to the heart of the Atacama desert, where they explored the driest region of the world. After a week or so in the desert they took the students over the Andes through the Jama Pass and into Argentina, spending time in Salta, San Juan, and Mendoza. The trip ended after driving back over the

Andes through the Paso Libertadores and spending a couple of days in Santiago, Chile.

Debbie is dedicated to offering study abroad opportunities to students at Western Kentucky University. The next study-abroad trip leaves for Tanzania during the new winter term (Dec. 28 - Jan. 18). The summer 2006 study abroad destination is tentatively scheduled for China.

Debbie is still the advisor to the Geography Club. Her goal for the club is to include more students in departmental activities, build camaraderie between faculty members and students, provide public service opportunities, and provide geographical experiences through field trips.

KEN KUEHN writes that Summer 2005 brings the end to his thirtieth year as a practicing geologist, as well as the beginning of his twenty-second year on the WKU faculty. He supposes that one advantage of all that personal 'geologic history' is an ability to be retrospective and to appreciate the trends that have, for better or worse, influenced the geology profession over the past three decades. When Ken began his professional career with Shell Oil, the U.S. was still recovering from the oil embargo that saw gasoline prices rise almost 50% from a national average of 38 cents per gallon in May 1973 to about 55 cents one year later. As incredible as it seems, it was that price rise which first signaled to all Americans the end of the era of abundant, cheap petroleum. Over this past year since writing the last GEOGRAM update, oil prices have once again jumped 50%, reaching a record $65 per barrel. Incredibly, gasoline prices at the pump today average $2.50 per gallon! This recent upsurge has stimulated a renewed interest in the fossil fuels among geology majors and Dr Kuehn was able to teach this past year (for only the second time) his course in Petroleum Geology to eight geology undergraduates and two geoscience graduate students. Employment in the energy sector (which offers the highest salaries in the geology discipline) is again streaming and at least three recent geology graduates are currently working for energy companies. One of them related to Ken this summer that he has a salary offer from a mid-major oil company of $72,000 (plus generous corporate benefits) as soon as he completes his Geology MS degree!

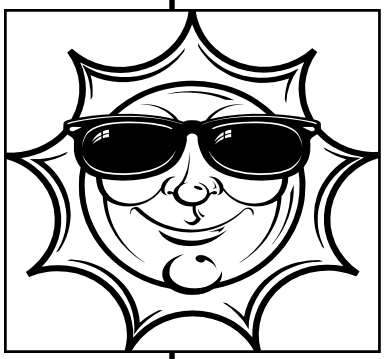


In other curricular news, the new Geology degree programs received their final approvals across campus in January 2005. It was a bit longer of a haul than first anticipated, but Geology finally emerged as the first discipline at WKU ever to offer both the BA and BS degrees! Drs Kuehn and May wrote a short article, *Retooling for Relevance*, describing the redesign efforts of the geology faculty, and their saga received kudos from the Kentucky Board of Registration for Professional Geologists for "…initiative and vision in creating a geology curriculum of academic excellence at Western Kentucky University that ensures graduates are fully prepared to enter the world of professional geology. We thank you for providing the Commonwealth with an educational model that will equip future graduates for leadership roles in this important discipline." (See *Kentucky Geologists*, v.6, no. 2, online at http://finance.ky.gov/ourcabinet/caboff/OAS/op/progeo/geo-newsletters.htm)

Ken continues to serve the statewide professional organization, the Kentucky Society of Professional Geologists, as both University Liaison and chair of a committee called "KSPG 2013." This committee is developing a long-range vision for the geology profession in Kentucky, one that includes a permanent address and constant presence in Frankfort. On the international horizon Dr Kuehn received a professional recognition this past year, a *Distinguished Service Award* from the Society for Organic Petrology (TSOP), during their annual meeting in Sydney, Australia. Over the past two decades Ken served the Society in four different elected leadership roles, including that of President. Here at home, Ken was chosen by the Dean as the Ogden College 'Faculty Member of the Month' in January 2005.

This Fall Dr Kuehn begins his fourth semester of service to the university in a half-time assignment as 'Faculty Associate' in the Faculty Center for Excellence in Teaching (FaCET). In this capacity Ken engages faculty and graduate students on issues of teaching and learning to help meet the objectives of

WKU's new Quality Enhancement Plan (QEP). He attended the annual conference of the Professional and Organizational Development (POD) Network in Higher Education in Montreal, Canada, this past year and presented a paper titled *Building Support for Faculty Development in Times of Budget Reductions*. This Fall he will present a workshop with four colleagues in faculty development from different universities at the annual POD conference in Milwaukee. Also this Fall, Drs Kuehn and May are slated to lead a field trip for the American Institute of Professional Geologists. So, that's it for Ken; he hopes your year has been busy and productive as well. Please keep in touch and perhaps he'll see you all at Homecoming 2005!



REZAUL MAHMOOD writes that he had a very productive year. His teaching and research activities kept him quite busy. Rezaul continued to teach meteorology, dynamic meteorology, and physical climatology. He also invested a significant amount of time and effort in expanding the climate and meteorology program. As in the past his research was focused around soil-moisture modeling (as it relates to climate), impacts of land-use change on long-term climatic records, hydrometeorology of flash flooding in eastern KY and the Appalachian region, and monsoon dynamics. A number of students have been involved (five graduate and four undergraduates) in these research activities, thus gaining hands-on experience. It was satisfying to report that three of Rezaul's students presented papers or posters at the annual meeting of the Association of American Geographers (AAG) in Denver, CO. Moreover, three of his students presented papers at the annual meeting of the Southeastern Division AAG (SEDAAG) in Biloxi, MS, and four of his students presented at the annual meeting of the Kentucky Academy of Sciences (KAS) in Murray, KY. One of his student won 1st prize in the paper competition at the annual meeting of the KAS. Two of Rezaul's students also won 1st and 2nd prize for their presentation at the Sigma Xi student conference.

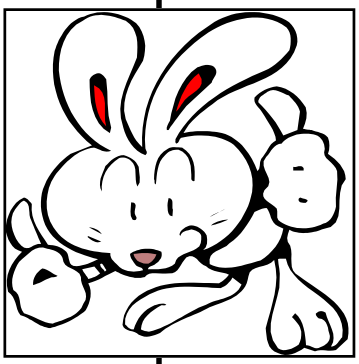
Rezaul published results of his research in peer-reviewed journals including *Agricultural and Forest Meteorology***.** A number of his papers have been either accepted or are currently in review with *Global and Planetary Change, International Journal of Climatology*, and *Hydrological Processes*. He is also currently working as guest editor for a special issue to be published by the journal *Global and Planetary Change*. Rezaul was also invited by the National Science Foundation to serve on two proposal review panels. It required a significant time commitment and was a notable professional achievement.

As in the past, he was involved in several multi-institutional grant-writing activities for extramural funding to support research here at WKU. This year Rezaul received funding from the United States Department of Agriculture (USDA) to conduct research on micro- and meso-scale land-surface atmosphere interactions (Total Budget: $45,000). This funding will allow him to recruit two graduate students. Last year Dr Cathleen Webb (Chemistry) and Rezaul received $254,000 in competitive grant funding from the National Science Foundation's (NSF) Research Experience for Undergraduate (REU) program. This funding is for three years and they have successfully completed the second year of the project. This past year they recruited seven extraordinary undergraduates from all over the nation to come to WKU for ten weeks to conduct research. As in the past, participating students focused their research on hydroclimatology, hydrology, water quality, and water chemistry issues around the Mammoth Cave National Park and the Upper Green River watershed. These activities allowed students to gain hands-on research experience under close one-to-one mentoring environment. Rezaul also submitted two large competitive grants to the NSF (Total budget: $600,000) to study soil moisture and monsoon.

Moreover, Rezaul and Dr Trapasso received funding ($75,000) from the KY-EPSCoR to establish a research grade modeling laboratory with the Department's new faculty member Dr Greg Goodrich. This will be a significant addition to our climate and meteorology program. An additional $10,000 was also obtained through a Perkins grant for this laboratory. This year, Rezaul and Dr Trapasso activated the NOAA-Port (Total external funding:

$24,000). This will allow the Department to receive real-time meteorological data (from minutes to hourly time scale) for the whole North American continent through a satellite feed. Last year Rezaul and Dr Foster received $24,000 to establish three mesonet sites in and around Bowling Green. Currently, they are close to operational stage. The WKU research council continued to fund Rezaul for his data-collection activities through a small-scale precipitation variability study ($1,000). The funding allowed him to maintain the high-density rain-gauge network (funded last year for instruments) in and around the Mammoth Cave National Park

Rezaul has continued to review papers for prestigious academic journals, including *International Journal of Climatology, Climate Research, Journal of Applied Meteorology, and Agricultural and Forest Meteorology*. Moreover, he went to Denver, CO, AAG annual meeting) to organize three special sessions in hydroclimatology. He chaired one of these sessions and presented a paper. He also presented or co-authored papers at annual meetings of the SEDAAG and the KAS.



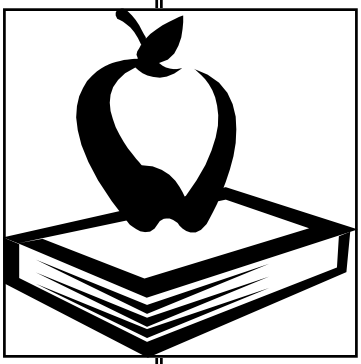
MICHAEL MAY has enjoyed his 9th year in the Department and working with other geologists to revise the undergraduate geology curriculum, advising and working with students, and collaborating with others on papers dealing with myriad topics such as sedimentological controls on groundwater flow, unconformities, terra rossa soils, crinoids, conodonts and biostratigraphy. These collaborations have mostly meant travel up to Indiana University and the Indiana Geological Survey. Mike also traveled to Denver with colleagues Drs Andrew Wulff and Fred Siewers, and MS student Scott Schoefernacker, for the national Geological Society of America meeting last fall. A poster with Drs Siewers and Kuehn on the 2004 Bahamas field course and its role in curricular revision in the Department was presented in Denver, along with a poster on the Mississippian-Pennsylvanian Unconformity and GIS with Scott. A side trip to the Red Rocks Park area was enjoyed by all while in Colorado. The trip was made more enjoyable for all the geology professors in attendance because they lodged at the "Conroy Hotel," an establishment known for excellent cuisine, friendly folks, and its peaceful foothill view setting in suburban Denver. Mike's in-laws, Laura and Dan Conroy, always enjoy geologists in the house and were most gracious hosts for the WKU crowd.

In addition to manuscript preparation, teaching courses, and conferences, Mike has enjoyed his continuance on the Boyd-Lubker Visiting Scholar Committee at WKU. This academic year's chosen speaker, Dr Marc Bekoff, from the University of Colorado, has collaborated with the famous Jane Goodall on research dealing with the great apes and their behavior. Dr Bekoff will guest lecture and participate in various classes while on campus. If you are near campus on February 23, 2006, his evening presentation should prove to be interesting. Announcement of his visit will be upcoming on the WKU website. Be sure to check it out.

Dr May is pleased to get his and a co-authors Drs Carl Rexroad (Indiana Geological Survey) and Lewis Brown (Lake Superior State University) manuscript entitled *Carboniferous Conodont Biostratigraphy along the South-eastern Periphery of the Eastern Interior Basin, Kentucky, USA* submitted to the journal *Micropaleontology* for publication. This paper chronicles the distribution of conodonts in rocks of Mississippian and Pennsylvanian age in Warren and Butler counties, northwest of Bowling Green. Conodonts are dentate or teeth-like hard-part microfossils extracted from shales and limestones and are believed to be jaws and teeth of worms or worm-like organisms common in marine strata. These microfossils are great temporal and environmental indicators in ancient environments. Dr Rexroad is a life-long expert on conodonts and Mike has certainly enjoyed learning much from him on this topic. There has been little detailed stratigraphic or even basic biostratigraphic control associated with Mississippian and Pennsylvanian strata near the systemic boundary in this part of Kentucky and this research will greatly fill in an existing stratigraphic data gap.

An interesting side issue while examining outcrops for the conodont biostratigraphy work that "cropped up" in March this year was the discovery of excellent fossils not by Dr May but by his sons Peter (12) and

Kevin (10). One fossil in particular that was found was a nearly complete crinoid with the head (calyx) and stem with a combined length of nearly 30 inches. Mike wanted to keep the fossil in place to show his students but then Peter and Kevin recognized that it might be bulldozed or excavated along a roadway so they elected to save it. This meant getting a power saw and cutting the specimen out of the rock in the field. You can imagine the excitement generated with the mix of power tools and children! Other small specimens were found nearby including a rare starfish and over half a dozen genera of crinoids, and the usual blastoids, brachipods, and bryozoans. The saving of the large crinoid specimen was discussed in kind of an ethics and geologic specimen collection letter Dr May had published in the letters section of the June 2005 issue of *Geotimes,* entitled *Saving a fossil*. Dr N. Gary Lane, professor emeritus at Indiana University, and a well-respected crinoid expert, is collaborating with Mike on identification of these specimens and Mike will place them in stratigraphic context and publish the results. Some of these crinoid specimens will be displayed in the Department in glass cases in the hallways for others to study and enjoy.



Over the past spring and summer, Mike also continued providing service for the Occupational Safety & Health Education & Research Center of the University of North Carolina, Chapel Hill, by his teaching a week-long environmental regulations course on two occasions, once in January, and the second time from late July to early August. The January course in Safety Harbor, Florida, in the Tampa Bay area was co-taught with WKU geology alum, Dr Scott Harris, who is now living in the greater Dallas area and is an EPA on-scene coordinator for disasters (e.g., train wrecks with chemical spills, space-shuttle acci-dents, etc). Scott has some pretty hair-raising tales about environmental and health disasters! Former WKU engineering colleague, Dr Rod Handy (Purdue University), co-taught the regulations course on Marco Island, Florida, with Mike. The May family enjoyed the south Florida trip, especially the May boys, as they missed their first three days of school but they had an "alternative assignment" checking out estuarine and beach strand wildlife and ecosystems of Marco Island, and of course, they were able to observe the Great Cypress Swamp and the Everglades. Great shelling, gators, sting rays, and dolphins were highlights of the trip.

Mike's wife, Beth, continues her consulting job at ENSAFE, Inc. as a geologist in Bowling Green. Two recent WKU geology graduates, Weldon Hawkins and Jason Kuykendall, have joined ENSAFE in their offices in Nashville and Bowling Green, respectively, over the past year. We are proud of their accomplishments and are happy they are employed in their field of study!

FRED SIEWERS enjoyed a productive year during 2004-2005. He offered courses in Introductory Geology, Historical Geology, and Stratigraphy, and an on-line course in Earth System Science for pre- and in-service teachers (co-taught with Margaret Crowder). His face-to-face courses involved his usual mix of engaged classroom teaching and experiential learning in the field and lab. His on-line course pushed an intrepid group of students into the exciting world of problem-based learning, an approach that involves groups of students collaborating to develop recommendations for real-world environmental problems. In addition to his teaching, Dr Siewers advised the undergraduate research project of geology major Rebecca Samples. Rebecca worked on a suite of oolite samples from the Mississippian of Kentucky and the Pennsylvanian of Kansas, characterizing and ultimately comparing their microfabrics and diagenetic histories. Rebecca was able to associate her microtextural observations with large-scale changes in the Mississippian-Pennsylvanian ocean-atmosphere system, changes interpreted to have impacted the original mineralogy of ooids and the shells of some fossil organisms. Her independent study paper and presentation were excellent, testimony to a job very well done!

On the research front, Dr Siewers continued his work in carbonate petrology and geochemistry. His research on the preservation of fossil peats in Pennsylvanian coal seams led him into the mire of magnesian calcite diagenesis and associated dolomite formation (a place he once vowed never to go….).

Fortunately, he appears to have survived that journey unscathed and is wrapping up a major research contribution for the *Journal of Sedimentary Research*. In addition, Dr Siewers was involved in two geoscience education projects: one with colleagues Mike May and Ken Kuehn on the educational value of exposing students to field geology early in their undergraduate training; the other with Margaret Crowder on the effectiveness of problem-based learning experiences in oceanography, natural hazards, and earth history courses. Both of these projects resulted in presentations at meetings of the Geological Society of America (Denver and Minneapolis respectively).

Dr Siewers was again quite active in variety of service activities. With Andrew Wulff and colleagues in Physics and Astronomy and the School of Education, he helped lead a workshop for middle-grades teachers on geological and cosmological time. The NASA-funded workshop resulted in loads of instructional materials for the teachers, innovative field and laboratory experiences, and a variety of lesson-plan ideas for the teachers to implement in their classrooms. Results from the workshop (and that of the previous year) were presented at a Joint Assembly meeting of the American Geophysical Union (and other organizations) in New Orleans. At the North Central meeting of the Geological Society of America, Dr Siewers agreed to become the Kentucky State representative of the National Association for Geoscience Teachers. He hopes to use that association to advance the visibility of the geosciences throughout the state of Kentucky. Finally, in the area of service, Dr Siewers was very active on a variety of campus committees and was instrumental in helping the Department push the new undergraduate geology curriculum through the tangle of the university curriculum revision process. Through his efforts and the efforts of Drs Keeling and Kuehn the new undergraduate geology curriculum is finally in place!

Dr Siewers continues to enjoy a very full and active family life with his wife Helen and his daughters Anna (age 9) and Maria (age 5). On weekends, he can often be found playing old-time music (guitar and, increasingly, banjo) with other folk music enthusiasts at a local restaurant. As always, he loves to hear from former students, alumni and anybody interested in the geosciences. Send him some e-mail (fred.siewers@wku.edu), or better yet stop on by! His door is always open.

L. MICHAEL TRAPASSO has been moving along with his usual agenda in the Department. His teaching load included: GEOG 100 (Physical Geography), where he uses his own textbook; GEOG 121 (Meteorology), part of his regular teaching load; GEOG 426 (Applied Meteorology/Climatology), his specialty; plus he has revived and redesigned GEOG 222 (Observational and Analytical Meteorology), a course that sat on the shelf for many years. He is still in charge of the College Heights Weather Station and the GEOG 121 Meteorology Computer Laboratory.

In the past year, he and colleague Rezaul Mahmood received another meteorology equipment grant, which brought in the new NOAA Port data antenna and receiver. This new system will bring in a flood of various types of atmospheric data for use in research and in the classroom. 'The Dynamic Duo' just received another equipment grant for a couple of new and powerful computer workstations. During the past year, Trapasso chaired the Faculty Search Committee, which recommended an offer to Dr Greg Goodrich (University of Arizona) as our new faculty member in climatology. He even took some time out to help his friend and colleague Glen Conner train some local middle-school students for the National Science Olympiad's "meteorology competition." They placed very highly, too.

On a professional level, Trapasso and former student Emily Noffsinger displayed a poster concerning 'Kentucky Droughts' at the Kentucky Climate Center's "Climate Services Workshop." This year Trapasso has been writing (revising) the next edition of his textbook *Essentials of Physical Geography*" by Gabler, Petersen, and Trapasso

(Thomson, Brooks-Cole Publishing). Evidently nation-wide sales were good enough to warrant another edition, scheduled for release in 2006. A few projects he had worked on in the past finally came to fruition. The new *Encyclopedia of World Climatology* (Springer Publishing) has several entries written by Trapasso. And a book entitled *Tourism, Recreation and Climate Change* (Channel View Publications) contains a chapter written by him as well.

On the travel front, Trapasso finally completed his "Viking Mission" (as he calls it). His aim was to follow the ancient Viking explorers from their homeland in Norway, to Iceland, to Greenland, and finally to Newfoundland, Canada, where Leif Eriksson's intrepid group landed on North American soil ca. 1000 CE. It took a while for him to complete these travels, but he said it was all worth the effort. Trapasso has already presented his "Viking Mission" slide show to several organizations, including a presentation at one of our Departmental Seminars.

Earlier this summer he completed a trip to Thailand and Cambodia, planning to visit some of the coastal areas devastated by the Tsunami of 26 December 2004 (see the story in this issue). Of course there were other destinations on the agenda as well, including some ancient Thai and Cambodia temples and ruins. Doing a little "Indiana Jonesing Around" in the jungles, as he calls it. Some of this travel was even done on elephant-back. This is a distinct change from the usual horseback riding he does as a Civil War re-enactor.

Speaking of which, he still reenacts Civil War battles as a member of the 7th Tennessee Cavalry, and 'Indian Wars' events as the Captain of the 10th U.S. Cavalry (The Buffalo Soldiers). His expertise in local Civil War History has kept him quite active in local community projects. So far, he has designed and written historical interpretive markers for three different sites in Bowling Green. A fourth marker is planned for posting at Fort Lytle, right on the WKU Campus. He was also the primary author of the brochure outlining the new *Bowling Green Civil War Discovery Trail*. And finally, a soon-to-be-released book on the *Civil War in Kentucky* will include a chapter on the "Civil War in Bowling Green," courtesy of Trapasso.

In all, what can we say: "Energetic, versatile and a bit crazy, Michael Trapasso is alive and well, and always busy."

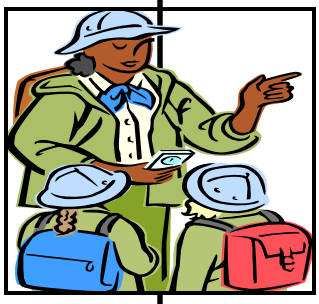
ANDREW WULFF concentrated this past year on continuing to develop the analytical side of "hard rock" geology at WKU by purchasing a wide array of sample preparation and analysis equipment, renovating lab space, and developing collaborations (within the Department, Ogden College and outside the university). He expanded field-based opportunities by co-leading two departmental fieldtrips and a field course in Hawaii, and taught again at the Wasatch-Uinta Field Geology Camp. He was quite active in investigating ways to improve earth science education and opportunities for K-12 students by developing courses and establishing stronger relationships with area science teachers through workshops and a multidisciplinary grant.

Andrew was a co-PI on an NSF grant with colleagues from Chemistry, Psychology, and the Regional Science Resource Center, seeking almost $1.6 million to examine the academic and social environment of a rural elementary school science classroom. The design was to develop new integrated science activities with the science and mathematics teachers, with the goal of enhancing science education in this setting. He led twenty lab presentations on minerals, rocks, earth resources, energy, geological hazards, and volcanoes to 4th, 5th, and 6th grade students at Austin Tracy Elementary School, and was dubbed "Dr. Rock" by the students. The original grant will be resubmitted, but a pilot study was funded at $86, 661 for one year in order to gather data necessary for the resubmission. And, we just got word that a second year of the pilot study was funded!!

Andrew also introduced students from three other schools to the wonders of rocks and minerals, and hosted students from Oakland Elementary School for a time in the Mineralogy lab, where WKU students served as presenters for a variety of activities. He has been training Geology majors to help with these presentations and become more involved in the community. Some have even gone back to their old schools as the "experts!" Dr Wulff (along with Dr Siewers and members of the Astronomy faculty) co-led a two-day workshop entitled "How Old Is Your Universe," designed to better prepare both pre- and in-service middle school science teachers in central

and western Kentucky. He continued to pursue the affiliation of WKU with the NASA GLOBE program, initiated a trial run of a soil moisture sampling program in local schools in collaboration with the international GLOBE SMC program, and worked with Crystal Bergman (an undergraduate Meteorology student) to design a lab based on understanding relationships between soil moisture, precipitation, run-off and phenology data.

Drs Wulff and Kenworthy co-led a departmental fieldtrip investigating the unique geological issues of the desert southwest from Las Vegas, through Death Valley, the Mojave Desert and back again. The group studied volcanic features of Ubehebe Crater, the Cima volcanic field, Hole-In-The-Wall, various hotsprings, folds and faults in Death Valley, Rainbow Basin, and the walls of Hoover Dam; even limestone in Mitchell Caverns and Mosaic Canyon! Student projects also included environmental and water-related issues around the Las Vegas area. Details and pictures were posted on a website designed by the students at: http://geoggeol.wku.edu/awulff/475dv/index.htm.



Andrew has been active with his various research interests and was a co-author on a paper entitled "Petrological study of basalt at Grumbulpring as an indication of volcanism in the southern part of Sangiran – Central Jawa," published in the *Journal of Geological Resources*. He participated in the International Goldschmidt Conference on Geochemistry and presented "Difficulties obtaining geochemical fingerprints of tuffs associated with early hominin sites, Solo Basin, Java." Dr Wulff also convened a topical session at the national meeting of the Geological Society of America in Denver entitled "Using Digital Geological Maps To Build Deeper Understanding of Earth Science Relationships," and presented "Digital Geologic Maps As A Meeting Ground For Engineering, Spatial And Physical Sciences." He was also a co-author on the presentation "How Old Is Your Universe?: A Workshop For Middle Grade Science Teachers" at the national meeting of the American Geophysical Union. Two of his undergraduate students (Crystal Bergman and Ashley Williams) presented their research at the meetings of the SE section of the Geological Society of America and Sigma Xi conference respectively. Ashley received an award for best paper in the session. Hurrah for Ashley

Dr Wulff also was awarded a WKU Junior Faculty Research Grant for a proposal entitled: "Geochemical and Isotopic Composition of Dikes From the Cowhole Mountains, CA." Dikes associated with the Independence Dike Swarm are exposed throughout the Mojave Desert, and are evidence of large-scale extension associated with rapid changes in tectonic plate motions along the Western Cordillera in the Late Jurassic. This research will examine the whole-rock, mineralogical, and isotopic compositions of dikes in the Cowhole Mountains, which represent the easternmost extent of the extension. The grant will involve collaboration with Dr Drew Coleman at the University of North Carolina-Chapel Hill and covers costs associated with fieldwork, isotopic analysis, and some of the travel costs to bring two undergraduates to work in the radiogenic isotope facility there.

Dr Wulff has been active in developing the analytical presence in the Department by purchasing a SPEX shatterbox and tungsten carbide container for powdering samples for analysis, an array of platinum crucibles and moulds, and a muffle furnace (capable of 1500^{o}C) for fusing samples into glass disks. Add to these a variety of hotplates, desiccators for storing geochemical standards and flux, beakers, and platinum tongs, and actually obtaining high temperature geochemical analyses is much closer to reality!! He is enthusiastic about the possibility of using the XRD, XRF, and TOF ICP-MS in the Materials Characterization Center both for research and the new Analytical Techniques course (GEOL 270).

Andrew continues to be involved in the community by helping to organize two neighborhood events (a Neighborhood Stroll with city officials, and a DARE picnic), making a number of presentations on rocks, minerals, and volcanoes (you name it!) at local schools, serving on the Board of the Southern Kentucky Soccer Club, continuing to play bass and sing around town in a rock band, and was a story-teller at a local church Sunday School.

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Future Geoscience Majors?

Geoscience Graduate Student Narçisa Pricope (left) and Geoscience Alumna Rhonda Pfaff at the 2005 ESRI Conference.

ALUMNI CONTRIBUTIONS

Contributions to the Department of Geography and Geology Development Fund in 2004-2005 increased over the past year. The number of individual contributions to our Fund topped the 100 mark! Thanks to everyone for helping us achieve our goals this year, but we continue to need your help now more than ever as budgets remain extremely limited; your contribution will go a long way to ensuring that we have sufficient supplies and equipment for student use. When you receive a call from our students, or whenever the spirit moves you, make a contribution to the Department and to the University. You can also gift funds to the Hoffman Memorial Fund, in memory of Wayne L. Hoffman, who led the Department for over 20 years. 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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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 2006 if you send in your Alumni Information sheet right away....."

ALUMNI NEWS

Chandra Beyer (Geography 2002) has begun a career with Integrated Loan Services in Melbourne, FL. She still plans to join the military and hopes to work for NASA in the future.

Sarah R. Blessing (Geography 2003) is a licensed real-estate broker in Ypsilanti, Michigan. Sarah was the Department's Outstanding Geography Senior for the 2002-2003 academic year.

Brandon Bratcher (Geography 2004) writes that he is currently working as an Associate News Producer for Fox 35 in Orlando.

Craig Calkins (Geology 2002) expects to complete his MS in Geology at University of Texas at Austin in December 2005. For his thesis, he is interpreting the sequence stratigraphy of the Cretaceous (Albian) Stuart City reef margin in the vicinity of Bee County, Texas. Craig writes that he's getting to know the rudists quite well! (Thank goodness for Paleo says Dr. Siewers!) In addition to his thesis, Craig has been working for Nexen Petroleum, a Canadian-based company with production in the Gulf of Mexico, North Sea, Yemen, West Africa, and Western Canada. For fun, Craig has been playing intramural softball for the Austin Sed Rox(!) and frequently visits the many, many fine pubs in the greater Austin area. As you might expect, he and his wife Carrie and are enjoying life in Austin and are catching loads of live music.

Brandon Cowles (Geography 2003) is employed with the Graves-Gilbert clinic in Bowling Green.

Frank M. Cuffe (Geography 1981) is in sales with Frito Lay, where he has worked for the past 20 years. Frank is based in Bowling Green.

Laura DeMott (Geology 2003) also writes from the University of Texas at Austin where she's really starting to crack down on her MS thesis research. For her thesis she is examining travertine deposits in the Austin area to see if geochemical changes in the travertine

can be related to increases in urbanization and hydrologic changes in the Edwards aquifer. Like Craig Calkins she is thoroughly enjoying Austin!

Alan Glennon (MS Geoscience 2001) is currently in the Ph.D. program at UC-Santa Barbara. Alan and **Rhonda Pfaff (MS Geoscience 2003)** recently announced marriage plans for Fall 2005. Rhonda works for ESRI in Redlands, CA.

Chris Hall (Geology 2001) just recently moved from Johnson City, Tennessee, where he was working as an exploration geologist for a medium-size independent gas company, mostly in the area of coal-bed methane exploration. Now he is working as an exploration geologist for Vintage Petroleum Inc. in Tulsa, OK. His focus at Vintage is on gas reservoirs in unconventional places such as "tight" sandstones, black shales, and coal. He reports that the work is fast-paced, challenging, and exciting almost every day.

Robert Marcum (Geography 2002) flies P-3s for the US Navy. He is based in Corpus Christi, TX.

Jim Mathews (Geography 1978) is the lead forecaster for the National Weather Service in Sacramento, CA. Jim was the Department's Outstanding Geography Senior for the 1977-1978 academic year.

Brandi Meredith (Geography 2000) served as Vice President of the International Law Society at the Vermont School of Law this past year. This Fall she begins the LLM program in International Law at the Brussels School of International Studies in Belgium.

Julie Neltner-Reizner (Geology 2003) reports that she is still attending Montana State University where she is working on her MS in vertebrate paleontology. Her thesis involves a paleohistological examination of bone tissue from the ceratopsian dinosaur *Einiosaurus* to better understand bone development and growth in ceratopsians. It is new, exciting research that has her making a lot of thin sections. Next year she will be TAing Physical Geology, which has her excited. Julie also reports that she recently got married! Congratulations Julie!

Bethany Overfield (Geology & Geography 2001) writes from Lexington, where she works full-time for the Kentucky Geological Survey, Energy and Minerals section. In addition to her "day job" she is also working on an MS in Geology at UK. Her thesis is focused on the hydrogeology of the Cumberland Gap Tunnel, which apparently needs some prompt attention! She and partner Chris have a lovely home in Lexington and are the proud parents of a wonderful catahoula leopard dog named "Moe."

Alison Parker (Geology 2001) is happily married to Chris Hall (Geology 2001) and is proud to report a new addition to the household - a rather large puppy named "Murphy." Alison and Chris wanted us to be sure to pass this note on to any current students and past graduates: "This is a great time to be a petroleum geologist! We are in very short supply and the generation gap between the older geologists and new geologists is huge. Companies are actively seeking new geologists everyday."

Holly Pelt (Geography 2004) works for FEMA as a Disaster Assistance Environmental Specialist and has been deployed to Atlanta, GA.

Tim Rink (Geography 2003) is a GIS Specialist with the Arcadis company in Atlanta, GA. One of the projects Tim worked on recently was highlighted in the *Professional Surveyor Magazine*, December 2004 issue. The article is titled 'County Government Utilizes Storm-Water Infrastructure Inventory: A Strategic Locational Approach' and it talks about the storm-water inventory process from collection to delivery for a local county in Georgia.

Chris Rutherford (Geology 1987) is the corporate geologist for Sanders Lead Company, a large lead foundry in Troy, AL. It produces over 120,000 tons of lead alloy every year, about 15% of the lead used in the USA every year.

Geary Schindel (MS 1981) has completed his 6th year as the Chief Technical Officer for the Edwards Aquifer Authority, Texas. The Edwards Aquifer

serves as the primary source of water for more than 1.7 million people and Geary works for the regional groundwater authority. He writes that it has been an interesting experience working on technical issues, drought control programs, commenting on legislation, directing the collection of basic water quantity and quality data, evaluating water use, initiating the Authority's tracer testing program, working on the Habitat Conservation Plan for the endangered species the use the springs, hosting field trips, etc. Water is an important issue in Texas and hardly a day goes by without a water issue being covered by the news

Jennifer Kaye (Sheppard) Doublin (Geography 1995) earned her Master's in Physical Geography from the University of Georgia in 2003. She is an Earth/Environmental Instructor for Moraine Valley Community College in Palos Hills, IL (a suburb of Chicago).

N. Adam Smith (Geology 2004) has been admitted to the graduate program at North Carolina State.

John Stark (Geography 1993) has been employed with the City of Richfield (an inner-ring suburb of Minneapolis) since 1998. He is contemplating entering the University of Minnesota's MPA program this Fall. John was the Department's Outstanding Geography Senior for the 1992-1993 academic year.

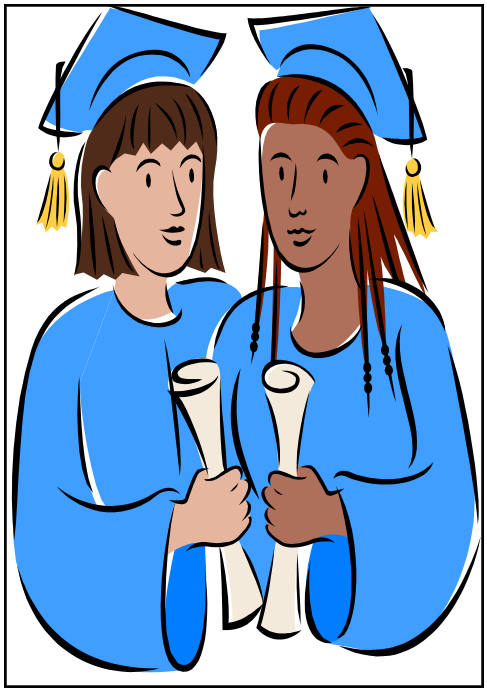
Mark Steedly (Geography 1982) is in his 22nd year as a senior geospatial analyst at the National Geospatial Intelligence Agency in Illinois. During Fall 2003, he took a three-week trip to the former Soviet countries of Turkmenistan, Uzbekistan, Kyrgyzstan, and Kazakhstan. He and wife Peggy (WKU Nursing 1982) are celebrating their 24th year of marriage, and have a daughter heading to college this Fall and a high-school sophomore son.

BettyJane Stradtner Nichols (aka 'Charlee') (Geography 1985) was promoted to GIS Technician Analyst in January 2004. Charlee works for the Marion County Board of County Commissioners in Ocala, Florida. She also has just completed the ESRI Authorized Training Program to become an ESRI Authorized Instructor for ArcGIS and ArcView.

Ron Taylor (Geography, Geology, 2004) now resides on Long Island, New York where he is employed by Environmental Resources Management, Inc. (ERM) in Melville, L.I., NY. He is an entry-level geologist whose job includes many aspects of environmental geoscience.

Greg Willoughby (Geography 1992) is the Division Agronomist for Helena Chemical. He and wife Amy announce the birth of daughter Kathryn Rose in December 2003, who joins sister Sarah in the family.

YOUR PROFILE AND NEWS BELONG HERE!!



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