

# Department of Geology

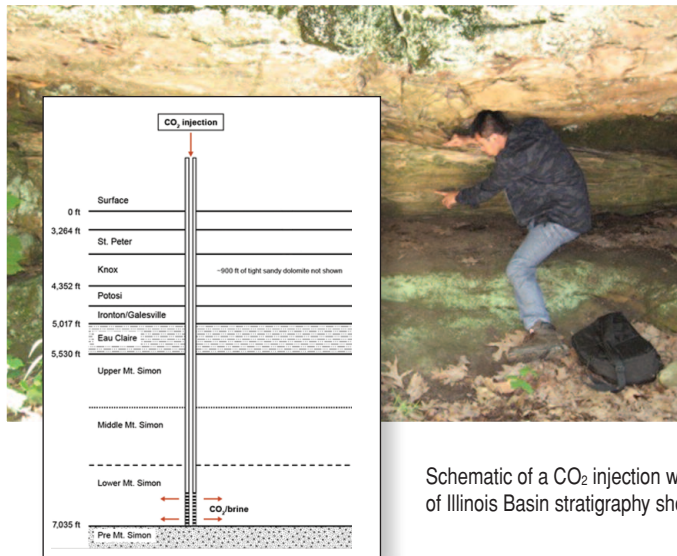
UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN  
*School of Earth, Society, and Environment*

## Department faculty contribute to major ISGS effort in carbon sequestration

Several faculty members, graduate students, and alumni of the Department are involved in a major multiyear, multi-million dollar project led by the Illinois State Geological Survey that crosses disciplines and universities and is funded by the U.S. Department of Energy, Office of Science, Basic Energy Sciences.

The Center for Geologic Storage of CO<sub>2</sub>, led by Scott M. Frailey, senior reservoir engineer at the ISGS, will contribute to ongoing efforts to store CO<sub>2</sub> underground rather than emit it into the atmosphere. Oil companies have used CO<sub>2</sub>-injection technology for years to enhance oil recovery, but large-scale storage of industrial CO<sub>2</sub> is in the pilot phase. The project will work to reduce uncertainties surrounding carbon dioxide storage by objectively analyzing early results from several previous field demonstrations and a current field demonstration located at Decatur, IL. Ultimately, the project seeks to illuminate potential “showstoppers” for real-world, commercial-scale CO<sub>2</sub> storage projects. Department professors Jim Best and Bruce Fouke, and alums Hannes Leetaru (Ph.D. '97) and Robert Bauer (M.S. '83), will join others from the Illinois State Geology Survey including Donna Willette, Scott M. Frailey, and Ed Mehnert to serve the project in specific research areas, including geophysics and sedimentology.

The center will receive funding for four years and involves a number of academic and not-for-profit research partners, including the National Energy Technology Laboratory, University of Notre Dame, Schlumberger, NORSTAR, SINTEF, University of Southern California, University of Texas at Austin, and Wright State University. Each are vital to the success of the project, which will uniquely



Schematic of a CO<sub>2</sub> injection well with selected formations of Illinois Basin stratigraphy shown.

Ruisong Zhou, a GSCO<sub>2</sub> Geology Theme member and PhD student in the Department of Geology, gauges the size of a bedform in braided stream beds of the Lamotte Sandstone at Pickle Springs Natural Area in Missouri. The Lamotte Sandstone is an analogue for the Mt. Simon Sandstone, a brine-saturated reservoir that CO<sub>2</sub> was injected into and is part of the GSCO<sub>2</sub>'s research.

link staff members with expertise in basic science with staff members who have experience applying current industry technology at the management, engineer and scientist level.

“The Center for Geologic Storage of CO<sub>2</sub> is focused on use-inspired basic research to find explanations and scientific solutions to observed uncertainty in

results from pilot and demonstration CO<sub>2</sub> storage projects,” Frailey said. “We expect our research to lead to technology that ensures the safe and secure long-term geologic storage of CO<sub>2</sub>.”

The project is part of the DOE’s development of Energy Frontier Research Centers. The awards are geared to acceler-

*(continued on back page)*

## Assistant to the Head, Marilyn Whalen Retires

Marilyn Whalen, the Assistant to the Head, will be retiring as of December 30, 2015. Marilyn has been working for the Department of Geology and SESE for over 8 years, balancing her time between the Department Head and the School Director. Marilyn has served under three Heads of the Department, including Steve Marshak, Wang-Ping Chen, and Tom Johnson.

“Everyone knows that Marilyn is the go-to person for many key things around the department,” says Johnson. “Grad students rely on her for help in navigating the graduate program rules and in getting their theses and dissertations ready to deposit. Faculty rely on her to help make key departmental committees, like

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## LETTER FROM THE HEAD

Dear Alumni and Friends,

During the 2014-2015 academic year, the Department of Geology was as lively as ever, but overall we experienced fewer tumultuous changes than in the past several years. We are settled into our temporary office space in the Computing Applications Building (CAB; corner of Wright and Springfield), and the laboratories are reasonably accommodated in various buildings around campus. Some Geology courses are held here in CAB, but most of them meet over in Davenport Hall, in space vacated by the Department of Geography and Geographic Information Science (now located here in CAB and slated to join us in the Natural History Building when the renovation is complete). With the NHB demolition phase over, work has started rebuilding the interior (*see article on facing page*). We are able to get periodic tours of the building as work progresses, and the changes are stunning. The last time I visited, the interior at the south end of the building was a cavernous space almost ready to begin its transformation into the newest, best earth science building in the big ten!

I would like to thank those of you who have already made gifts and/or pledges toward the Natural History Building Renovation Fund. As many of you know, the funding plan for this project involves several different sources within the university and not a large capital outlay directly from the State of Illinois. A significant component of the total funding plan is gifts from alumni and other friends of the departments that will occupy NHB. Based in part on the

strong tradition of giving by all of you, we were able to pursue, without severe cost constraints, the ambitious renovation needed to restore NHB and make it a highly functional and inspiring setting for the next several decades of excellence in education and research. This year, as we begin to look toward the end of the project, I encourage every one of you to make a gift to the NHB fund if you have not done so already. This is our greatest need at the present time, so please consider directing your generosity toward the Natural History Building Renovation Fund (the fund code is 337834).

One exciting change that has been brewing for the past several years is a big increase in the number of undergraduate Geology majors. The number reached 88 before graduation this year! We are glad to have an abundance of geology students, even as it stretches our teaching capabilities to the limit. We surmise that this increase resulted from the combination of excellent job prospects and the reputation of the department as a place where students find interesting subject matter and engaging instructors. Of course, we do expect hiring in the oil and gas sector to be slower going forward, because of the current low prices of oil and gas on the market. I was told yesterday that oil was \$36 a barrel in the Illinois basin recently! On the other hand, baby boomer retirements continue, and I am happy to say that annual recruiting visits by our closest industry partners will occur as normal, in September.

If oil and gas hiring is receding for now, there's good news from the environmental consulting industry. After relatively slow times over the past several years, we have had more inquiries and job postings recently. One recent graduate accepted a position with an environmental firm in Chicago just the other day.

Overall, demand for our graduates remains strong despite periodic swings in the overall geoscience hiring picture. We strive to give our students broad training in geoscience and help them develop strong problem-solving skills. As a result, they compete successfully for a wide range of jobs. There will always be strong demand for scientists who understand the earth, from sedimentary architecture to earth materials to geophysical methods to fluid flow in porous media. The tasks our graduates perform may vary, from groundwater remediation to oil exploration to carbon sequestration (see our article about a large effort underway at the Illinois State Geological Survey), but the fundamental science and problem solving ability does not. Thus, I see a bright future for our numerous Geology majors, and we aim to keep the number high.

In my four years as head of the department, I have had the great pleasure to meet many of you and communicate with many others via phone, letters, and email. Over time, I have become increasingly fascinated by the department's history and the chain of talented, ambitious people that have interacted, in various student/faculty/staff roles, to keep that history rolling, over many decades. The Illinois Geology community is spread around the world (how's Brunei treating you, Mike?) but we each share deep ties to this campus and a love of geology. Please send news whenever you can; we love to hear from you all.

Very best wishes from the department,

*Tom Johnson*

Tom Johnson

Year in Review is published once a year by the Department of Geology, University of Illinois Urbana-Champaign, to highlight the activities and accomplishments within our department and feature news from our alumni and friends.

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## Whalen retirement

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Marilyn with family and colleagues she has worked with during her UI career. L to R, Rhonda Kissling, Lana Holben, Lisa Stickels (sister), Virginia Swisher, Jill Rannebarger, Susie Conrad, and Ashley Stickels (niece).

graduate admissions and graduate studies, run smoothly. I rely on her to do a thousand things, from scheduling meetings to planning receptions at conferences. She holds important “institutional memory” and in many ways is central to the functioning of the department.”

Marilyn has not only brought her professionalism and organization skills to keep the administration running smoothly, but she’s also introduced a bit of fun to the Department, helping to plan the reindeer games of the Christmas party, the summer picnic, and other celebrations as well. She’s also been an invaluable resource to the grad students of the department, helping keep them on track for degree requirements, performing format checks on dissertation, addressing numerous questions, and simply being a guiding presence in the Geology front office. “Working with them towards earning their degree has been very rewarding. I’ve done my best to provide the support needed,” Marilyn says.

Marshak adds, “Soon after starting, Marilyn had to take on the added responsibility of becoming the solve-all-problems person for the newly formed School of Earth, Society, & Environment.

Marilyn took on the new responsibilities with gusto, and developed an office management system that keeps not only the department administration, but also the school administration, running more than smoothly. She will be missed!”

Marilyn plans to become more involved with her family farming operation in Champaign and Piatt counties during her retirement, as well as exploring the possibility of beginning her own farm bookkeeping service. She’ll also be kept quite busy with her granddaughter Aubrey and twin granddaughters, Stella and Savanna, born August 2015.

“Working in Geology has been a rewarding experience. I had not worked for an academic unit prior to my hire in Geology and working with the students has been most enjoyable.” Marilyn says. “Whether they needed a shoulder to cry on, someone to share their thoughts with, or candy to brighten their day, I’ve done my best to provide the support needed.”

Marilyn also recently received the LAS Distinguished Staff Award for 2014-2015 for her service. She has been working at the University in one way or another for twenty five years. She will be missed, but the Department wishes her a happy and healthy retirement.



Interior of the previous museum space, which will be the new student hub when NHB reopens.

## NHB update 2015

The Natural History Building renovation project has proceeded at a brisk pace since it began in the summer of 2014. The demolition process, essentially complete as of June, 2015, was complex, requiring removal of asbestos, salvaging of valuable materials, and careful removal of historic woodwork that will be placed back into the building at the end of the project. For months, an astonishing volume of material was removed from the building as walls, floors, and other components were demolished. Dozens of 20 foot-long dumpsters were carted away per day! Fortunately, as the underlying structure was revealed there were no big surprises, such as foundation flaws, that could add major time and cost to the project. There were some minor surprises, such as remnants of old wooden floors in the basement, holding up walls that were removed last fall. Apparently, removal of the wooden floors, done long ago, involved sawing along the walls, leaving strips buried underneath. There are also some 107 year-old footprints in the concrete in various places. Some of you have already read, in the Winter 2015 LAS Newsletter, that we became aware that NHB contains a time capsule from 1892.

The building now has vast, cavernous spaces inside, as most of the interior walls have been removed. As of summer, 2015, work to construct the new spaces is moving forward. New steel frameworks are in place in the former “courtyard” spaces north and south of the central lecture hall. These spaces previously had single-story additions built in them, housing laboratories and “the catacombs”; in the new design, they will be completely filled in to create four stories of new teaching and laboratory facilities. Overall, the project has had minor delays but is nearly on schedule, with completion estimated in late 2016.



## Best named AGU fellow

Jack C. Threet & Richard L. Threet Professor Jim Best was named one of the 2015 American Geophysical Union (AGU) fellows.

This honor is given to individual AGU members who have made exceptional scientific contributions and attained acknowledged eminence in the fields of Earth and space sciences. Since the establishment of the AGU Fellows program in 1962, and in accordance with AGU bylaws, no more than 0.1 percent of the total membership of AGU is recognized annually.

“Jim’s world-leading research program in sedimentary geology, his international stature, and many contributions to the field made him a clear candidate for AGU Fellow status. As readers of this newsletter know, Jim’s work on sediment dynamics in big rivers takes him around the world- I believe he is in Bangladesh at the moment- and connects to major questions in both modern river processes and the architecture of sedimentary rock features. We’re very glad to have Jim as the Threet Professor in the Department of Geology.”

Best and other new fellow recipients will be recognized during a ceremony on Wednesday, 16 December, held during the 2015 AGU Fall Meeting in San Francisco.

## Donuts and Dynamics: Students organize a lively seminar

Over the last year, a group of up to about 20 students and faculty have been meeting with the goal of bringing together students and professors with different backgrounds to facilitate interdisciplinary collaboration in geodynamics and related areas of geophysics, tectonics, and petrology. The academic discussion is the obvious draw—well, that, and the donuts.

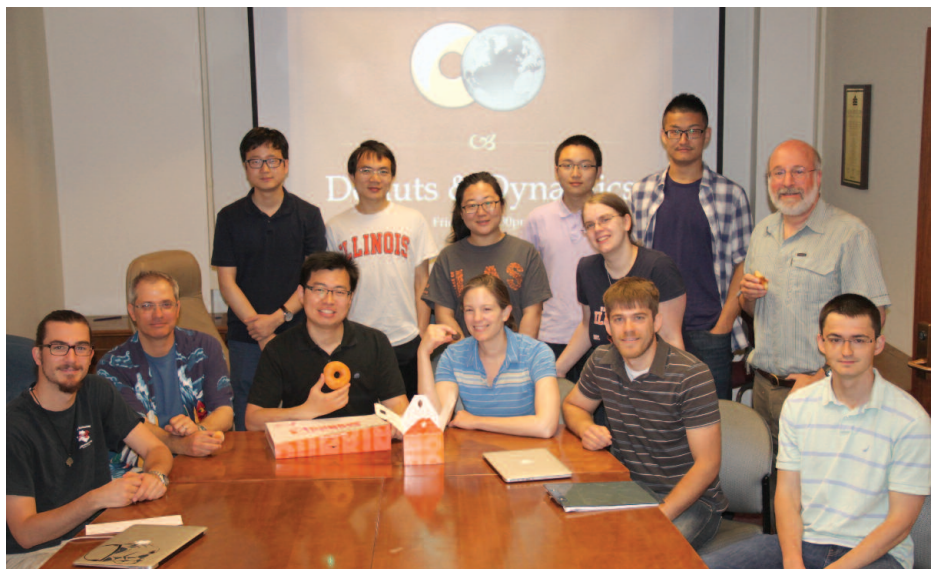
The student-organized group meets Fridays at 9:30 with coffee and donuts to discuss a broad topic chosen each semester and relate it to active research in the department, new developments in the broader research community, and possible new research directions.

“Each week, a student or small group of students presents a paper relating to a particular topic and usually their specific subdiscipline,” says Stephen Picek, who founded the group a little over a year ago. “The rotating responsibility for the presentations gives each student an opportunity to understand what another is specializing in, and how their work can help one another.”

Picek, a grad student working with Jay Bass, developed the group after overhearing a discussion between Prof. Craig Lundstrom, an igneous petrologist, and Prof. Lijun Liu, a geodynamicist talking about implications of mantle plumes to each of their fields.

The group started with 3 faculty and 5 students, and has more than doubled in size over this past year. Semester topics have included plumes and hotspots (Summer 2014), western US tectonics (Fall 2014), and the South American subduction zone (Spring 2015). This summer, the group plans to examine the Alaskan subduction zone.

“Faculty have been crucial in organizing topics for the group and recommending interesting papers,” says Picek. “I think one of the best benefits to the students is to see and learn from faculty openly discussing their ideas without a curriculum guideline.”



Faculty and student members of the Donuts and Dynamics research discussion group.

## Three alums named award recipients

The Department of Geology was thrilled to see three of its alums receive awards at the AAPG Eastern Section meeting on September 28, 2014 in London, Ontario. Both **James Cobb** (B.C. '71, Ph.D. '81) and **Donald McKay** (M.S. '75, Ph.D. '77) were awarded the prestigious Presidential Award from the Eastern Section AAPG for their contributions to the field over their professional career. **Steve Greb** (B.S. '82) was named the recipient of the prestigious AAPG Eastern Section award.

**McKay** is a second-generation geologist from the Illinois oil patch (Crawford County), where his father, Ed McKay, was a prominent and respected Illinois Basin petroleum geologist. McKay joined the Illinois State Geological Survey's Hydrogeology Section in 1973 and became Assistant Geologist in 1976. He was soon recruited to work in the nuclear power and nuclear waste isolation industry, for three years characterizing the geology of nuclear power plant sites and evaluating hydrogeologic settings of nuclear waste isolation sites. Then ISGS pulled Don back to his "scientific and employment home." McKay was an early promoter of the use of digital technology in geology and became lead geologist for the implementation of GIS in 1983 and head of the Computer Research Section 1985. He was promoted to head of the Geologic Mapping and Framework Studies Group and eventually Chief Scientist in 2000. McKay fostered the creation of digital products and databases, enhanced computer mapping and 3-D visualization capabilities, and had all of the Survey's publications scanned and posted online. He initiated open access to well records, seismic data, and maps. More broadly, under McKay's leadership, the ISGS became the largest state geological survey in the nation, its national and international programmatic reach expanding widely. He retired as Director of the Illinois State Geological Survey and as the 12th State Geologist of Illinois on May 30, 2014, after 38 years of service.

**Cobb** spent his professional career of nearly 46 years in public service as a geologist with the Kentucky and Illinois state geological surveys. Thirty-four of those years were at the Kentucky Geological Survey as geologist, Assistant State Geologist, director & State Geologist. His research interests include basin and coal geology; groundwater geology of North Africa; industrial minerals; and seismic hazards in the New Madrid Seismic Zone. He wrote more than one hundred articles on geology and public policy. As state geologist he initiated online public service for maps and geological/resources data and KGS gained national recognition as a leader in online computer access for maps and databases. He began an exchange program with the China Lanzhou Institute of Seismology in 2005 that continues. As Historian for the Association of American State Geologists (AASG) he edited the Centennial history volume of that organization. As president of AASG, he set the agenda and priorities for the association and served as its chief executive. He was a member of the Kentucky Board of Registration for Professional Geologists for 14 years. He has been an adjunct professor in the UK Department of Geological Sciences for 30 years. He served on a number of national boards including the National Research Council Board on Earth Resources, AGI executive committee, AASG executive committee, and the U.S. Geological Survey energy and geologic mapping committees.

He has also received the Outstanding Career Award from the U.S. Geological Survey for cooperation over his career with that organization and distinguished service awards from the Kentucky Board of Registration for Professional Geologists, American Institute of Professional Geologists, Geological Society of Kentucky, and Lanzhou Institute of Seismology. Jim retired in 2014 but stays active and continues research in China and Kentucky.

**Greb** is currently a research geologist at the Kentucky Geological Survey (KGS), University of Kentucky (UK), and an adjunct professor in the Dept. of Earth and Environmental Sciences at UK. During his professional career, he has received 18 awards for research, authored or co-authored more than 60 papers in refereed journals and textbooks; and has also authored, coauthored, or contributed to more than 100 field guides, KGS reports, and published abstracts. His duties at KGS include research on geologic carbon storage (sequestration), the subsurface geology of Kentucky, the geologic analysis of Kentucky coal beds, basin analyses, stratigraphy, sedimentology, paleontology, and communication of geological research results to industry and the general public. As KGS education outreach committee chair, he also coordinates education outreach activities and is responsible for content of the Earth Science Education Network on the KGS Web site.

### Obsidian donation



Professor Emeritus Gerald Guthrie of the School of Art and Design has donated this sample of obsidian to the Geology Department for display in NHB after renovations are complete. The specimen is the largest (see quarter for scale) and best example of obsidian that most of us have seen. It was collected by Dr. Guthrie's uncle Everett Jensen, when he worked as a forest ranger in northern California around 1950. We thank the Guthries for their donation, and we encourage our alumni to think of the department when you are downsizing!

## The Inner, Inner Core

Prof. Xiaodong Song and his students continue to plumb the world's deepest mystery: the planet's inner core.

Thanks to a novel application in seismology, Song's research team in the department and colleagues at Nanjing University in China have found that the Earth's inner core has an inner core of its own, which has surprising properties that could reveal information about our planet. The work was led by Song and visiting postdoctoral researcher Tao Wang, and the team published its work in the journal *Nature Geoscience* on Feb. 9.

"Even though the inner core is small—smaller than the moon—it has some really interesting features," said Song. "It may tell us about how our planet formed, its history, and other dynamic processes of the Earth. It shapes our understanding of what's going on deep inside the Earth."

The team used a technology that gathers data not from the initial shock of an earthquake, but from the waves that resonate in the earthquake's aftermath. The earthquake is like a hammer striking a bell; much like a listener hears the clear tone that resonates after the bell strike, seismic sensors collect a coherent signal in the earthquake's coda.

"It turns out the coherent signal enhanced by the technology is clearer than the ring itself," said Song. "The basic idea of the method has been around for a while, and people have used it for other kinds of studies near the surface. But we are looking all the way through the center of the earth."

Looking through the core revealed a surprise at the center of the planet—though not of the type envisioned by novelist Jules Verne. The inner core, once thought to be a solid ball of iron, has some complex structural properties. The team found a distinct inner-inner core, about half the diameter of the whole inner core. The iron crystals in the outer layer of the inner core are aligned directionally, north-south. However, in the inner-inner core, the iron crystals point roughly east-west. Not only are the iron crystals in the inner-inner core aligned differently, they behave differently from their counterparts in the outer-inner core. This means that the inner-inner core could be made of a different type of crystal, or a different phase.

"The fact that we have two regions that are distinctly different may tell us something about how the inner core has been evolving," Song said. "For example, over the history of the earth, the inner core might have had a very dramatic change in its deformation regime. It might hold the key to how the planet has evolved. We are right in the center—literally, the center of the Earth."

The U.S. National Science Foundation and the National Science Foundation of China supported this work.

*Contributions from the University of Illinois News Bureau and Liz Ahlberg, Physical Sciences Editor.*

## Faculty and Students Earn Teaching Awards

It was another outstanding year for the faculty and teaching assistants in the Department of Geology, as they continue to be recognized for excellence in their teaching endeavors.

Fifteen Department of Geology instructors were named to the University's List of Teachers Ranked as Excellent for the spring and fall 2014 semesters.

The rankings are released every semester and are based on student evaluations maintained by the Center for Teaching Excellence on the Illinois Campus. Faculty appearing on this list include Stephen Altaner, Jay Bass, Alison Anders, Lijun Liu, Steve Marshak, Xiaodong Song, and Michael Stewart.

Graduate students Laura DeMott, Ann Long, Stephanie Mager, Andy Nash, Stephanie Napieralski, Rachel Oien, and Eric Prokocki were named to the list for their work as teaching assistants in the department.

Six instructors received the highest ranking of "outstanding." Stephanie Mager, Andy Nash, Rachel Oien, and Xiaodong Song took top honors in the spring semester while Rachel Oien earned this ranking in the fall semester.

## Marshak and Herrstrom online course reaching thousands

Partnering with the educational company Coursera and with the university's Center for Innovation in Teaching and Learning, the Geology Department has added another massive, open, online course (MOOC) to its list. *Planet Earth . . . and You!* provides an overview of selected geological topics. It

discusses how earthquakes, volcanoes, minerals and rocks, energy, and plate tectonics have interacted over deep time to produce our dynamic island in space and its unique resources. Steve Marshak produced more than 90 short videos for the course, and Eileen Herrstrom wrote assignments and assessments. The MOOC

was offered for the first time in the spring of 2015, with over 30,000 students enrolled. According to our Coursera contact person, one educator from Brazil was "incredibly impressed" and "raved" about the high quality of the materials. Marshak and Herrstrom are currently planning for the second offering of the course.

## Spring Field Course: Viewing and mapping a world-class ophiolite and related sediments



Students examining mantle rocks (mainly harzburgite) in the Troodos Ophiolite on top of Mt. Olympus, Cyprus

Professor Stewart demonstrating cross section sketching methods at the classic Akaki Canyon exposure of submarine pillow lavas intruded by cross-cutting dikes.



The 2015 Spring Field Course returned to Cyprus and the Troodos Ophiolite for Spring Break 2015. Twenty-seven students were selected to participate in the course that spent 10 days on the island of Cyprus. The main attraction was the Troodos Ophiolite, one of the classic exposures of the entire sequence of rocks that make up oceanic crust. Students worked from the top down, first looking at pelagic chalks and marls that overly the extrusive section. Then they worked down into a thick sheeted dike section and into gabbros and intrusive rocks of the lower crust. Finally they saw the (paleo) mantle and an exposure of the Moho represented by the transition from layered gabbroic rocks to tectonized harzburgite (olivine and orthopyroxene). Students also looked at recent faulting and uplift of the island. The capstone segment of the trip was a mapping exercise that challenged students to synthesize what they had learned and visualize structures in three dimensions (while trying to keep their maps dry in the driving rain!).

The trip, funded in part by a generous gift from Shell Oil Company, provides an opportunity to apply classroom concepts to the real world. Students stayed in a small mountain village named Kakopetria (Bad Rock). This served as the base, being centrally located in the complex and suitable for students to do their field mapping project on foot. Hellenic Mining Co. also gave them a tour of the world famous Skouriotissa copper mine which has been mined for thousands of years, and recently has had fossils of organisms found at the remnants of deep-sea hydrothermal vents discovered within its boundaries.

In May of 2016 the Spring Field Course, led by Professor Jim Best, will return to western Ireland to study the development of the Clare Basin from the karstic Burren on the north to deep-water shales and turbidites of the Ross, Gullig and Gull Island formations. This is a classic site for the study of basin development used by oil and gas companies to train employees and students.

*Contributed by Stephen Hurst*



## Field Camp 50th Anniversary Celebration 1967-2016

Join us in a celebration of 50 years of nationally recognized, award winning field education!

We are putting together 2 great opportunities to remember the laughs (and possibly tears), return to the scene (of the crime?), reminisce, and reconnect with fellow campers.

### Reunion

**Chateau Apres in Park City, UT**  
7/25/16 - 7/28/16

Featuring new field trips by local geologists, visits to old favorite field areas, and perhaps a walk or two up to watering holes on main street.

### Evening celebration

**2016 National Meeting of the Geological Society of America in Denver, CO**

9/25/16 - 9/28/16

(exact date, time & location TBD)

*Please visit the link below for more information.*

[www.fieldcamp.org/anniversary](http://www.fieldcamp.org/anniversary)



Willow Nguy works on repairing a rhino nest from NHB

## Undergraduate geologist studies, repairs Fossil Rhinos

In the summer of 2014, the Department of Geology moved out of its traditional home in the Natural History Building so that renovations could proceed. Several remarkable pieces from the Department's long history have gotten special attention as a result of the move. One such piece is a fossil rhinoceros 'hash' of *Diceratherium* (two disarticulated skeletons of horned young adult rhinoceroses) from the Miocene strata of Agate Springs, Nebraska collected by Harold R. Wanless.

After many years of being on display near the north door of NHB, the rhinoceros hash was in disrepair and needed attention. Undergraduate student Willow Nguy (seen here on left) created a senior thesis research project on the curation and characterization of this rhinoceros fossil display. She attempted to process the rhinoceros bones by re-uniting the young adults' skeletons. She worked on the curation of the rhinoceros bones at the Illinois

Natural History Survey under the guidance of Dr. Sam Heads, Curator of Paleontology (seen on right) and Dr. Jackie Wittmer, lecturer in the Department of Geology

Meanwhile, museum exhibits from the NHB hallways (some of them more than half a century old!) are being updated and enhanced with more rocks, minerals, and fossils and new labels. Many are already being used for instruction in the current Geology teaching area in Davenport Hall. A new display greets students as they enter and highlights building stone used in buildings around the Quad. Samples, photographs, and geological details of rocks and other materials used for construction are illustrated in the display case and on a website <http://publish.illinois.edu/quad-geology/>. A location map shows places where stones like the ones on campus have been quarried and where raw building materials materials such as clay and lime may be obtained.

## Bruce Fouke Delivers AAPG Huffington Lectures

Professor Bruce Fouke was appointed the 2014/2015 AAPG Roy Huffington Distinguished Lecturer in the Asia/Pacific Region. This included an AAPG lecture tour in New Zealand, Australia, Thailand, Vietnam and Japan.

His talks included: "State-of-the-Art Oil Field Geobiology: Implications for Exploration and Production"; "Coral Reef Ecosystems on a Warming Planet: Lessons from Yellowstone Hot Springs"; "Human Kidney Stone Formation: Insights from Yellowstone, Roman Aqueducts and the Deep Microbial Biosphere."

The Distinguished Lecture Program offers outstanding lectures by speakers who are respected scientific leaders in their disciplines within petroleum geology. Lecturers are sent to AAPG-affiliated geological societies and geoscience departments of universities and colleges throughout the world.

## Lura Joseph Honored for Distinguished Service in Geoscience Information

Lura E. Joseph, former Geology Librarian and currently Content Access and Research Services Librarian at the U of I, was honored recently by the Geoscience Information Society (GSIS) with the 2014 Mary B. Ansari Distinguished Service Award. The award recognizes significant contributions to the field of geoscience information. Joseph's distinguished record is notable in particular for her work documenting geological field trip guidebooks. From 2001 to 2012 Joseph served as Geology and Digital Projects Librarian at UIUC. She is a past president of the Geoscience Information Society.

*Contributed by the GSIS news release.*



## Professor Albert V. Carozzi: Prolific Sedimentary Petrographer Taught From 1955 to 1988

by Ralph L. Langenheim

*Editor's Note: "Windows into the Past" is a regular feature of the Year in Review contributed by Professor Emeritus Ralph L. Langenheim. Ralph's writing represents a long-serving faculty member's recollections and his perspectives of the Department's past.*

Although Professor Albert V. Carozzi's surgeon father, Luigi Carozzi, had been a member of the Italian delegation to the League of Nations, after Italy withdrew from the League in 1937 the family remained in Switzerland. As a consequence, Carozzi grew up in Geneva and thought of himself strictly as Swiss. Educated exclusively in Swiss schools and at the University of Geneva, he completed his M.S. in 1947 and graduated summa cum laude as a Dr. Science in geology and mineralogy in 1948. His doctoral fieldwork involved detailed measurements and descriptions of limestone sequences exposed on sheer alpine cliffs. Carozzi also served in the Swiss Army. Sitting around camp fires in such places as Arrow Canyon, outside Las Vegas, Nevada, Albert would tell one of his favorite stories about his military career. When his infantry company came to a bridge, while marching clomp, clomp, clomp, Carozzi failed to order the company to break step and thus set up a harmonic reaction that exceeded the bridge's strength and consequently caused it to collapse!

In 1955 Carozzi came to Illinois as one of then Department Head George White's visiting professors. Upon completing his visiting professorship he was appointed as a permanent staff member, rising to become full professor in 1959. In 1963 he became an American citizen. During his tenure Carozzi taught structural geology, sedimentary petrography and the history of geology. His structural geology course was notable for introducing University of Illinois students and staff to Alpine Geology, principles and methods, a subject under-emphasized among North American geologists. In sedimentology he specialized

in microfacies analysis of carbonite rocks. For at least one year Carozzi taught his structural geology course in French in an effort to help graduate students prepare for the foreign language requirement for the Ph.D.—arguably a cause for some students' failure to complete that program. In addition to English Carozzi was fluent in Italian, German, French, Spanish and Portuguese, a talent that greatly facilitated his career.

Carozzi advised a very large number of graduate students (58 total, 20 masters and 38 doctorates). Overwhelmingly his students utilized his microfacies technique to investigate carbonate rocks—44 out of 45 theses. Thirty-eight of these projects were carried out in the Paleozoic of Upper Midwestern states, 31 in Illinois and Indiana, mostly addressed to Paleozoic reef deposits. Sixteen projects were completed in the miogeosynclinal Ordovician through Permian sequence in Southern Nevada. Two projects were located in New Jersey, one each in Arkansas and Texas, and four along the Upper Mississippi Valley. Foreign projects include one in Alberta, Canada, two in Peru, four in Brazil. A prolific writer, Carozzi published over 300 journal articles and books. In 1990 Carozzi published the third edition of his *Introduction to Sedimentary Petrography* summarizing his microfacies approach to the field. In it, he fully acknowledged his students contributions to the book.

Carozzi was also an historian of science, publishing many translations of seventeenth and eighteenth-century European (classic) geological works, a number with his wife, Marguerite, who completed a B.A. in French language and a masters in the history of geology at the University of Illinois. In addition, Carozzi consulted with petroleum companies, engineering companies and governmental organizations throughout North America, South America, Europe and Asia. With Ralph Grim he organized and developed projects in the Ivory Coast and South Vietnam. For two years he was an invited visiting professor in the



Federal University of Ouro Preto in Minas Gerais, Brazil, and also evaluated petroleum related research. In South Vietnam he explored petroleum possibilities. In Argentina he evaluated petroleum prospects for the national petroleum company and in Bolivia he conducted an international congress on mineral resources. He was also active in Italy, Morocco, Peru, the Philippines, Spain, France and Switzerland. For several years Albert and I joined forces in the Arrow Canyon range, Clark County, Nevada, where he supervised several microfacies studies of the miogeosynclinal sequence of Ordovician through Permian sequence.

Albert Carozzi died on July 5, 2014 in Raleigh, North Carolina, where he had retired to be near his daughters, Vivianne Marocco and Nadine Carozzi, and his four grandchildren. His wife Marguerite preceded him in death six months earlier on January 22, 2014.

Albert Carozzi was my colleague, friend and neighbor. I remember him fondly and regarded him highly. On one of our trips from Urbana, Illinois, he blew a tire on a deserted Nevada highway at 90 mph! Fortunately no one was hurt and we were soon on our way. Albert lived many years on Delaware Avenue in Urbana. I enjoyed him. I found him stimulating. I was impressed with his linguistic abilities, his energy. We shared an interest in the history of geology.

*This contribution to "Windows into the Past" is also an obituary of Albert Carozzi. Obituaries by Carozzi's daughters; Kennard Bork and Kenneth L. Taylor were sources of information along with Kathleen Marsaglia's "Distinguished Education Award" presentation at the 2003 AAPG was another valuable resource. Finally my own memories are part of this contribution.*

## IN MEMORIAM

**Curtis H. Ault (M.S. '56)** died on February 17, 2015. He joined the United States Army Air Force after he finished high school, a couple of months before he turned 18 years old, and remained in the service for three years. He then started college on the G.I. Bill at Kent State University, graduating with a degree in geology in December 1953. He went to graduate school at the University of Illinois and received a Master of Science degree in geology in 1956. His first job was with Carter Oil Co. (later Humble Oil Co. and then Exxon). During an assignment in Durango, Colorado, he met a secretary at the company, Dixie Jo Reynolds, dated her, fell in love with her and married her at a ceremony in Vernal, Utah, her birthplace, Aug. 23, 1958. Curtis and Dixie started their married life in Carmi, Illinois, for seven years and then were transferred by his company to Evansville, Indiana, during 1965. During 1968 he took a job at the Indiana Geological Survey, Bloomington, and worked there until he retired during 1993.

**Albert D. Glover, 86, (M.S. '64)**, died on November 25, 2014. He was Geologic Mapping Division Coal Geologist for the Commonwealth of PA, DCNR, Harrisburg; a Army veteran of the Korean War; a 50 year member of Camp Hill United Methodist Church; a 50 year member of Lowther Manor Lodge #781, F.&A.M., Camp Hill; Harrisburg Consistory and a past president and member of the Keystoneans.

**Barry M. Livingston (B.S. '60)** died on July 22, 2014 at the age of 76. Barry was born July 15th 1938 in LaGrange, Illinois and is survived by his wife Kathi and his two sons Barry and Jeffrey Livingston. Barry has 4 grandchildren, Alexander, Grant, Gavin and Jane. Barry graduated from the University of Illinois in 1960 and spent his career in the commercial banking industry.

**Dr. Haydn H. Murray (M.S. '48)**, geologist and longtime professor of geology at Indiana University, died on February 4, 2015. Haydn attended the University of Illinois, where he earned his bachelor's, master's and Ph. D in geology, specializing in clay mineralogy. In 1951, he became an associate professor and a clay mineralogist for the Indiana Geological Survey at Indiana University. In 1957, Haydn left Indiana University to enter industry as director of research for Georgia Kaolin Company in New Jersey. At Georgia Kaolin Company,

Dr. Murray held several positions: vice president; chief operating officer and finally executive vice president. In 1973, when the owner of Georgia Kaolin died and the company was sold, Haydn was asked to return to Indiana University as chairman of the geology department, a position he was happy to accept. He remained at Indiana University until he retired at age 70.

**Dr. Lee Bert H. Somers (M.S. '65)** died on January 1, 2015 in Flagstaff, Ariz. Lee was born on Feb. 18, 1938, in Champaign County, Ill., and raised on a farm there. He discovered his love of water and knack for teaching in Boy Scouts, becoming an Eagle Scout. After working as a commercial hard-hat diver in Florida, Lee earned a master's degree in geology from the University of Illinois and a Ph.D. in oceanography from the University of Michigan. He was on the University of Michigan faculty for 30 years, teaching oceanography, scuba diving, and diving technology, while serving as the university's diving safety officer. He also established a hyperbaric chamber for treatment and research at the University of Michigan.

**Robert Isaac Terry, Jr. (B.S. '47)** died on September 16, 2014 at the age of 91 in San Antonio. He worked as a geologist in a few places, but most of his time was spent in Corpus Christi and Houston. Robert shared the love of sailing with his family. He later took up writing and watercolor painting. In 1977, he married Norma Guttman and shared a great love for her family and his caretakers. Robert was preceded in death by his first wife, Patricia in 1976, and his son, 2nd Lt. Ike Terry, US Marine Corps in 1967 in Vietnam.

**Ronald Porter Willis, 88 (Ph.D. '58)** died on July 8, 2015. He and his wife Thora Isabella Brown Willis, 84, were unfortunately killed in a tragic car accident near Plymouth, Utah. He was a field geologist in many parts of the world and taught geology at University of Wisconsin-Eau Claire for the last 28 years of his career.

**No further information provided:**

Wayne N. Hill (B.S. '53)  
Donald O. Johnson (Ph.D. '73)  
James Mercer (M.S. '72, Ph.D. '73)  
Mark Rich (Ph.D. '59)  
Nancy Savula (B.S. '71)  
Matthew J. Waskelo (B.S. '42)  
Eldon L. Whiteside (B.S. '57)

*A note to all: Department alumni have established a "UIUC Geology Alumni" group on LinkedIn, a popular professional networking site ([www.linkedin.com](http://www.linkedin.com)). There are currently 90 members, covering a wide range of employment, geographical area, and age. LinkedIn is a good way to keep track of your professional network.*

**2010s**

**Steven Battaglia (B.S. '12)** was the winner of the Pellas-Ryder award for Best Student Paper in Planetary Sciences in 2014. This award, which is jointly sponsored by the Meteoritical Society and the Planetary Geology Division of Geological Society of America, is for undergraduate and graduate students who are first author of a planetary science paper published in a peer-reviewed scientific journal. The award for 2014 recognized Battaglia's paper, "Io's theothermal (sulfur) – Lithosphere cycle inferred from sulfur solubility modeling of Pele's magma supply," which was published in *Icarus*.

**Norbert Gajos (B.S. '11, M.S. '14)** is now working with Pacific Northwest National Laboratory at the old Hanford site in Richland, Washington. He has a post-M.S. fellowship doing radiochemical separations and trace actinide analysis on TIMS and other instruments. He's expecting to get involved with isotope-ratio tracing projects, specifically tracing fish migrations, carbon sequestration, and uranium and chromium contamination.

**Stephen Picek (B.S. '12, M.S. '15)** is working for St. John-Mittelhauser & Associates, an environmental consulting firm in the Chicago area.

**Julia Waldsmith (B.S. '11)** has been working at Schlumberger in Houston since 2013.

**2000s**

**Marynia Kolak (BS '06)** is the GeoDa Fellow at Arizona State University, and has been working on food access (or "food desert") research with Chicago collaborators at Northwestern. She'll be writing up the food access/spatial analysis article as first author for publication. She's also working on a systems integration project for spatial data software and applications, and she is the new Director of Wellness for the grad student association to further promote public health.

**Michael Fortwengler (MS '02)** is still working for Shell, but was transferred to Brunei, a tiny country on the island of Borneo, a while back. He also got married, and his wife, Lalana, joined him there.

**Anna Sutton (B.S. '01, M.S. '03)** is a licensed professional geologist working as an environmental consultant with Stantec in the Chicago Area. She established the Illinois Geology LinkedIn group.

## 1990s

**Steve Hageman (MS '88, Ph.D. '92)**; <http://www.app-state.edu/~hagemansj>) wrote with his news: "I am a full professor in the Dept. of Geology at Appalachian State in Boone, NC. It is a very pleasant place located in the Blue Ridge Mountains. I continue my research on phenotypic variation, microevolution and speciation primarily using bryozoans. I am currently coeditor of the Journal of Paleontology and kept busy in the business of the Paleontological Society. About five years ago I married Dr. Liz Miller who is an applied linguist at University of North Carolina, Charlotte. We share time between our urban and mountain homes and travel together to interesting places whenever we can. Last summer Liz was a very good sport on a week-long bryozoan field trip with me in Sicily."

## 1980s

**Mark Fischer (B.S. '87)** was appointed Chair of the Department of Geology and Environmental Geosciences at Northern Illinois University as of July 2014. He has been a faculty member there since 1995.

**Christine Kaszycki (M.S. '84, Ph.D. '89)** works in Sudbury, ON for the Ontario ministry of northern development and mines, as Assistant Deputy Minister and coordinator of the "Ring of Fire" Secretariat. The secretariat works and consults with Aboriginal peoples, northern Ontarians and the mining industry to encourage responsible and sustainable economic development in the region. The Ring of Fire is a large planned chromite mining and smelting development project located in the James Bay lowlands roughly 535 km north-east of Thunder Bay, ON.

## 1970s

**Mike Bourque (M.S. '78)** retired from Shell a while back, after 30 years in the industry, with the last 3 years in the Netherlands. He and his wife Marsha (a geologist formerly with Chevron, BP and Conoco) live in Houston but also spend a fair amount of time in Santa Fe.

**Rich Dobson (B.S. '78)** lives in the Chicago area and works in the energy industry- but in a very different way than many other department alumni. He works for Integrity, and is intimately involved in making sure millions of customers in the Chicago area get their natural gas each day.

**Andrew M. Gombos (M.S. '73)** recently retired after 2 years of service with Chevron and 36 with Exxon and ExxonMobil. He received his B.S. in geology from Washington and Lee University in 1970. After getting his M.S. at U. of I. he earned a Ph.D. in marine geology in 1976 from Florida University in Tallahassee. His petroleum career ranged from biostratigraphy to carbonate geology to regional geology. He spent the last twenty years doing geophysics and retired as senior geophysical advisor. He was active in the Deep Sea Drilling Project and also was seconded to Abu Dhabi for 4 years working geophysics on the super giant Bu Hasa field. He lives in

Houston where he continues diatom research, enjoys shooting high power rifles, traveling, birding, and studying Hungarian. He is associated with the IRF stratigraphy consultants out of Anchorage.

## 1950s

**Lorence Collins (Ph.D. '59)** Lorence (Larry) Collins (B.S. '53, M.S. '55, Ph.D. '59), emeritus professor of Geology at Cal State Northridge, continues to stay in touch and is particularly active in his work to present a rigorous geological perspective to respond to claims made by creationists. He recently mentioned a book titled *Grand Canyon: Monument to an Ancient Earth. Can Noah's Flood Explain The Grand Canyon?* Larry writes, "I want to call [everyone's] attention of a new book about the origin of the Grand Canyon which the young-earth creationists (YECs) assert, as you undoubtedly know, was deposited by Noah's Flood about 4,363 years ago. I have heard recently that the Geological Society of America is seriously considering publishing this book, but the eleven authors of the book are seeking some additional funding to support publication costs, if the book is accepted for publication. The book is beautifully done in full color with lots of wonderful photos of the Grand Canyon and will be about 220 pages long." Larry also continues his research on metasomatic granite; detailed description of his work can be found at: <http://www.csun.edu/~vcgeo005/index.html>

Send us your personal and professional updates by e-mailing us at [geology@illinois.edu](mailto:geology@illinois.edu) or by regular mail to:

Department of Geology  
University of Illinois at Urbana-Champaign  
156 Computing Applications Building, MC-235  
605 E. Springfield Avenue  
Champaign, IL 61820

Please include degree(s) earned and year, along with your current affiliation.

## Stay Connected

To help us assure that you receive future issues of our newsletter and other communications from our department, Geology alumni are encouraged to update their contact information with the University of Illinois Alumni Association via email to [alumni@illinois.edu](mailto:alumni@illinois.edu) or if you prefer to call, 217-333-1471, 800-355-2586. You can also update your information directly by going to [www.uialumninetwork.org](http://www.uialumninetwork.org) and clicking on the blue alumni sign-in here button. This is especially important as we look to communicate more electronically in the future.

## Faculty

Stephen Altaner (Associate Professor)  
Alison Anders (Associate Professor)  
Jay Bass (Ralph E. Grim Professor of Geology)  
Jim Best (Threet Professor)  
Jessica Conroy (Assistant Professor)  
Bruce Fouke (Professor)  
Patricia Gregg (Assistant Professor)  
Feng Sheng Hu (Ralph E. Grim Professor of Geology and Associate Dean, LAS)  
Tom Johnson (Professor and Head)  
Lijun Liu (Assistant Professor)  
Craig Lundstrom (Professor)  
Steve Marshak (Professor & Director of the School of Earth, Society & Environment)  
Gary Parker (W. Hilton Johnson Professor)  
Xiaodong Song (Professor)  
Wendy Yang (Assistant Professor)

## Affiliate Faculty

Stanley Ambrose (Professor, Anthropology)  
Marcelo Garcia (Seiss Professor, Civil and Environmental Engineering)  
Scott Olsen (Associate Professor, Civil and Environmental Engineering)  
Surangi Punyasena (Assistant Professor, Plant Biology)  
Bruce Rhoads (Professor, Geography)

## Specialized Faculty

William Guenther (Research Assistant Professor)  
Eileen Herrstrom (Lecturer, Curator)  
Stephen Hurst (Research Programmer)  
Ann Long (Teaching Lab Specialist)  
Jacalyn Wittmer Malinowski (Lecturer)  
J. Cory Pettijohn (Research Assistant Professor)  
Rob Sanford (Senior Research Scientist)  
Michael Stewart (Clinical Assistant Professor)  
Jonathan Tomkin (Research Assistant Professor & Associate Director, School of Earth, Society, and Environment)

## Adjunct Faculty

Ercan Alp  
Kurtis Burmeister  
Brandon Curry  
Robert Finley  
Leon Follmer  
Sam Heads  
Dennis Kolata  
Hannes Leetaru  
Drew Phillips  
Thomas Phillips  
George S. Roadcap  
William Shilts  
Wolfgang Sturhahn  
Scott M. Wilkerson

## Emeritus Faculty

Thomas F. Anderson  
Craig Bethke  
Daniel B. Blake  
Chu-Yung Chen  
Wang-Ping Chen  
Donald L. Graf  
Albert T. Hsui  
Susan Kieffer  
George D. Klein  
Ralph Langenheim  
Alberto Nieto  
Lois M. Pausch  
Philip Sandberg

## Department Support Staff

Marilyn Whalen (Assistant to Head)  
Lana Holben (Office Manager)

## Research Grants Active in 2014

### U.S. AIR FORCE

**Xiaodong Song**—Joint Inversion of Crustal and Uppermost Mantle Structure in Western China

**Xiaodong Song**—Surface Wave Attenuation in Tibetan Plateau from Ambient Noise

### EXXON-MOBIL

**Jim Best**—The Sedimentology of Tidally-Influenced Fluvial Bars in High-energy River Systems: the Modern Columbia River

**Jim Best**—Sedimentology of Fluvial-Tidal Meander Deposits

**William Guenther**—Raman Spectroscopy Dating in Detrital Zircons and Correlations with Zircon (U-Th)/He Dates

### MAXIS ENERGY CORPORATION

**Jim Best**—Passaic River Survey

### NASA

**Bruce Fouke**—Towards Universal Biology: Constraints from Early and Continuing Evolutionary Dynamics of Life on Earth

**Tom Johnson**—Tracking Earth's Early Oxygenation Using Chromium Isotopes

### NATIONAL GREAT RIVERS RESEARCH AND EDUCATION CENTER

**Alison Anders**—Sediment transport and storage in the upper Sangamon river basin: Characterizing sediment dynamics across gradients of change

### NATIONAL SCIENCE FOUNDATION

**Alison Anders**—Intensively Managed Landscapes: Critical Zone Observatory

**Jay Bass**—Consortium for Materials Properties Research in Earth Sciences (COMPRES): National Facilities and Infrastructure Development for High-Pressure Geosciences Research

**Jay Bass**—Sound Velocities and Elasticity of Deep Earth Materials at High Pressures and Temperatures

**Jay Bass**—High-Resolution Inelastic X-ray Scattering at High P&T: A New Capability for the COMPRES Community

**Jim Best**—Collaborative Research: Modifications of Turbulent Boundary Layer Structure by Wall permeability and Surface Subsurface Interactions: An Innovative Experimental Approach

**Jim Best**—Collaborative Research: Role of Interfacial Turbulence in Hypoheic Exchange and Fine Particle Dynamics

**Jim Best**—Large-Scale Refractive-Index-Matched Flow Facility Support

**Jim Best, Marcelo Garcia, and Bruce Rhoads**—Morphodynamics of Complex Meander Bends on Large Rivers

**Tom Johnson**—Microbial Oxidation of Hg(0): Its Effect On Hg Stable Isotope Fractionation And Methylmercury Production

**Lijun Liu**—Deciphering the Origin of Intra-Plate Volcanism in the Pacific Northwest Using Geodynamic Models with Data Assimilation

**Craig Lundstrom**—Acquisition of a Laser Ablation System for the Department of Geology UIUC

**Craig Lundstrom**—Collaborative Research: Investigating MORB differentiation through non-traditional stable isotope analyses

**Craig Lundstrom**—Integrating Experiments with Observations at Oldoinyo Lengai Insights into Alkalic Magmatic Processes

**Steve Marshak**—Collaborative Research: Structure and Dynamics of the North American Craton—An Earthscope Swath from the Ozarks to the Grenville Front

**Xiaodong Song**—Theoretical and Observational Studies of Surface Wave Attenuation From Ambient Noise

**Jonathan Tomkin**—Scaling cultures of collaboration: Evidence-based reform in portal STEM courses

### SHELL INTERNATIONAL

**Gary Parker**—Numerical and Experimental Modeling of Tidal Morphodynamics Stratigraphy

### TOTAL E&P RECHERCHE DEVELOPPEMENT

**Bruce Fouke**—Depositional Diagenetic and Microbial Controls on the Three-Dimensional Distribution of Porosity and Permeability Within Travertine Reservoir Analogs

### U.S. DEPARTMENT OF ENERGY

**Jay Bass**—Aqueous Geochemistry at High Pressures and Temperature

**Jim Best, Bruce Fouke**—Center for Geologic Storage of CO<sub>2</sub>

**Jim Best**—A non-conventional CO<sub>2</sub>-EOR target in the Illinois Basin: oil reservoirs of the thick Cypress sandstone

**Craig Lundstrom and Tom Johnson**—Development Of U Isotope Fractionation As An Indicator Of U(VI) Reduction In Uranium Plumes

**Rob Sanford**—Assessment of Anaerobic Metal Reducing Anaeromyxobacter Populations in DOE Relevant Radionuclide Impacted Scenarios

### UNIVERSITY OF BIRMINGHAM, UK and UK NATIONAL ENVIRONMENT RESEARCH COUNCIL

**Jim Best**—The hydrodynamics of microbial landscapes

### UNIVERSITY OF HULL

**Jim Best**—TIFZ Morphodynamics and Sedimentology of the Tidally-Influenced Fluvial Zone

**Jim Best**—Climatic and Autogenic Controls on the Morphodynamics of Mega-Rivers Modeling Sediment Flux in the Alluvial Transfer Zone

**Jim Best**—Quantification and Modeling of Bedform Dynamics in Unsteady Flows

## Student Awards

**Mackenzi Marti, Andrew Reinhard, and Richard Vachula** received the Outstanding Geology Senior Student Award, presented to undergraduate students who have shown both academic excellence as well as department participation.

**Alexander Taylor** won the Estwing Pick Award, presented annually in the Spring to an undergraduate who will attend field camp that summer. The principal criterion is academic achievement in geology courses and in cognate science and mathematics courses. Consideration is also given to involvement in undergraduate research and to participation in departmental activities. The award is an Estwing Pick donated by the Estwing Corporation.

**Erin Murphy** received the Harriet Wallace Award, presented to an Outstanding Woman Graduate based on performance in research and course work, in the memory of Harriet Wallace, past librarian in the Department of Geology.

**Stephen Picsek** received James R. Kirkpatrick Award, a college of LAS award to a graduate student for outstanding research efforts, established to honor past Department Head, James R. Kirkpatrick.

**Rachel Oien** and **Erin Murphy** were recognized as Outstanding TAs, based on ICES results and faculty supervisors' comments.

**Abigail Asangba, Jiashun Hu, Noah Jemison, Jing Jin, Kelsey Kehoe, Jiangtao Li, Joel MacKinney, Eric Prokocki, Naomi Wasserman, Nathan Webb, and Quan Zhou** received Morris Leighton research grants. The Fund was established in 1971 in memory of Morris M. Leighton at the request of his family. Morris M. Leighton was an assistant professor of geology at Illinois and a geologist for the Illinois State Geological Survey from 1919-1923. In 1923, Morris M. Leighton was appointed Chief of the Illinois State Geological Survey and served in that capacity until his retirement in 1954. He held the title of Chief Emeritus of the Illinois State Geological Survey until he passed away in 1971.

**Matt Bizjack, Laura DeMott, Michael Delucia, Melinda Higley, Noah Jemison, Derek Lichtner, Erin Murphy, Stephanie Napieralski, Andy Nash, and Rachel Oien** were the recipients of the Roscoe Jackson Research funding grants, designated to support needs of graduate students who are completing thesis research. Dr. Jackson has been a strong supporter of Geology graduate students and their research over the years.

## Colloquium Speakers for Fall 2014 and Spring 2015

### Fall 2014

#### September 4

*The R. James Kirkpatrick Lecture*  
Ilya Bindeman, University of Oregon  
"Rhyolites Are Hard to Make but Easy to Recycle: Micro-isotopic Evidence and Numerical Models"

#### September 11

Lijun Liu, UIUC Department of Geology  
"Cenozoic Evolution of North America: From Mantle Dynamics to Paleoclimate Change"

#### September 17

Susan Kieffer, Center for Advanced Study and Walgreen Professor Emerita of Geology and Physics  
"Natural Hazards and Human Behavior: The Dangerous Dynamics of Megadisasters"

#### September 18

Yarrow Axford, Northwestern University  
"Tracking Holocene Climate and Ice Sheet Behavior Using Lake Sediments from Greenland and Arctic Canada"

#### September 24

*AAPG Distinguished Lecturer*  
Don Clarke, University of Southern California  
"Hydraulic Fracturing and Earthquakes: Ethically, How Do We Move Forward and Do the Right Thing?"

#### October 2

*Richard L. Hay Lecture*  
Steve Grand, University of Texas, Austin  
"Mantle Flow Determined by Joint Seismic/Geodynamic Inversions"

#### October 9

*Glenn and Susan Buckley Lecture in Environmental Geology*  
Ross Powell, Northern Illinois University  
"West Antarctic Ice Sheet Dynamics: Modern Subglacial Processes and Paleoglaciology"

#### October 16

*Ralph E. Grim Lecture in Sedimentary Geology*  
Julie Fosdick, Indiana University  
"Andean Foreland Basins: A Thermochronological Perspective on Deformation, Sediment Provenance, and Basin Thermal Histories"

#### October 23

Dana Labotka, Illinois State Geological Survey  
"A 417-year Seasonally Resolved Tree-ring Oxygen-isotope Record: Influences of Climate Oscillations and Solar Forcing"

#### October 30

*The Inaugural Phillips Lecture in Paleoscience*  
Andrew Knoll, Harvard University  
"The Deep History of Life"

#### November 6

*Department of Geology Alumni Achievement Award Presentation*  
John Shelton, Ph.D. 1952, Geology, University of Illinois  
"Selected Advances in Petroleum Geology: 1949-Present"

#### November 13

*Mineralogical Society of America Distinguished Lecturer*  
Lutz Nasdala, University of Vienna  
"Natural Radiation Damage in Minerals: What Can We Learn?"

#### November 20

*Richard L. Hay Lecture*  
Thorne Lay, University of California, Santa Cruz  
"A Global Surge of Great Earthquakes and What We Are Learning From Them"

#### December 4

Art Bettis, University of Iowa  
"Provenance and Processes: Last Glacial Loess in Midcontinent North America"

### Spring 2015

#### January 29

*The Future of Big Rivers Series*  
Steven Goodbred, Vanderbilt University  
"Constructing the Ganges-Brahmaputra Megadelta: From Process to Morphology to Stratigraphy"

#### February 5

Sam Heads, Illinois Natural History Survey  
"Fossils and Feijão: Early Cretaceous Insects from the Crato Formation of Brazil"

#### February 19

Broxton Bird, Indiana University-Purdue University Indianapolis  
"Unraveling Holocene Hydroclimates Using High-resolution Lake Sediments from the World's Water Towers"

#### February 26

*Glenn and Susan Buckley Lecture in Environmental Geology*  
Frank Corsetti, University of Southern California  
"Earth-Life Transitions: Unexpected Reorganization of Marine Ecology, Sedimentation, and Geochemistry After the Triassic-Jurassic Mass Extinction"

#### March 5

*Ralph E. Grim Lecture*  
Maggie Osburn, Northwestern University  
"Geobiology of the Deep Subsurface Biosphere: Homestake Mine, SD USA"

#### March 12

*Richard L. Hay Lecture*  
Dave Pearson, Idaho State University  
"Sediment Underthrusting Beneath the Coast Mountains Batholith, British Columbia: Causes and Consequences"

#### March 19

William Guenther, UIUC Department of Geology  
"Thermal Evolution of Mountain Belts: From the Atomic to the Orogenic Scale"

#### April 2

*Earthscope Lecture*  
Anna Kelbert, Oregon State University  
"Water Content and Processes in Complicated Subduction Settings as Inferred with Electromagnetic Methods"

#### April 9

*Richard L. Hay Lecture*  
Nadine McQuarrie, University of Pittsburgh  
"Evaluating the Importance of Structural Geometry, Rates of Thrusting and Topographic Evolution on Thermochronometer Cooling Ages: Insights from the Bhutan Himalaya"

#### April 16

*R. James Kirkpatrick Lecture*  
Blair Schoene, Princeton University  
"Constraining Crustal Evolution on Very Short and Very Long Timescales"

#### April 23

*R. James Kirkpatrick Lecture*  
Laurent Montesi, University of Maryland  
"Melt Migration at Mid-Ocean Ridges: A Tale in Three Acts"

#### April 27

*The Future of Big Rivers Series*  
Andrew Nicholas, University of Exeter  
"Computer Simulation of Large River Evolution"

#### May 18

*The Darcy Lecture (National Ground Water Association Distinguished Lecturer)*  
Rainer H. Helmig, Institute for Modelling Hydraulic and Environmental Systems, University of Stuttgart, Germany  
"Evaluating the Competitive Use of the Subsurface: The Influence of Energy Storage and Production in Groundwater"

#### June 11

Martin Van Kranendonk, University of New South Wales, Australia  
"A Planetary Driver of Atmospheric, Environmental, and Biological Change Through the Precambrian."  
David Pearce, University of New South Wales, Australia  
"Proposed GeoBioCell Experiments: An Archean Perspective"



Graduates of Geology and SESE, May 2015

## Publications

- Abad, J., Frias, C., Konsoer, K., Best, J., Rhoads, B., Langendoen, E., Garcia, M.H. Modulation of the flow structure by progressive bed forms in the meandering Wabash River. *Proceedings of the International Conference on Fluvial Hydraulics, RIVER FLOW 2014*, 1113-1117.
- Basu, A., Johnson, T.M., Sanford, R.A., Cr isotope fractionation factors for Cr(VI) reduction by a metabolically diverse group of bacteria. *Geochimica et Cosmochimica Acta*, 142, 349-361.
- Basu, A., Sanford, R.A., Johnson, T.M., Lundstrom, C.C., Löffler, F.E. Uranium isotopic fractionation factors during U(VI) reduction by bacterial isolates. *Geochim. Cosmochim. Acta* 136, 100-113. DOI: 10.1016/j.gca.2014.02.041
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## Degrees Conferred in 2014-15

### Bachelor of Science Degrees

#### August 2014

Kyle Handschin  
Soojin Hyung  
Andrew Reinhard  
Cody Schwenk  
Hideyuki Terashima

#### December 2014

None

#### May 2015

Roman Ambiz  
Ryan Bowman  
Jacoby Jackson  
Scott Kangas  
Mackenzie Marti  
Willow Nguy

Kaitlin Pruitt  
Cameron Stewart  
Mark Strom  
Richard Vachula  
Katarzyna Walkowska

### Master of Science Degrees

#### August 2014

None

#### December 2014

**Elizabeth Armstrong**, "Isotopic Fractionation of Chromium and Uranium during Cr(VI) Reduction by Ascorbate and U(VI) Reduction Sulfide"

**Theodore Grimm**, "Isotopic study of Uranium: Determining the Isotopic Fractionation of Uranium during Abiotic Reduction with Iron (II)"

**Kelsey Kehoe**, "Investigation of Iron Isotope Variability in the Bi-modal Aztec Wash Pluton, Eldorado Mountains, Nevada"

#### May 2015

**Abigail Asangba**, "Microbial Phylogenetic Diversity Preserved in Facies-Specific Modern, Recent Holocene and Pleistocene Hot-Spring Travertine Deposits of Yellowstone and Turkey"

**Nicholas Huggett**, "Making Oceanic Plagiogranite Bodies by Thermal Migration: Evidence from the Argos Transect, Troodos Ophiolite, Cyprus"

**Tiffany Leonard**, "Testing the Hypothesis of the Slab-Plume Interaction on the Formation of the Yellowstone Hotspot System"

**Erin Murphy**, "Quantitative Tracking of Cellular and Skeletal Response of the Caribbean Coral *Orbicella Annularis* to Gradients in Marine Sewage Pollution"

**Martin Palkovic**, "Depositional Characterization of the Eau Claire Formation at the Illinois Basin Decatur Project: Facies, Mineralogy, and Geochemistry"

**Stephen Picsek**, "Sound Velocity Study of the Natural Orthopyroxenes with Varying Content"

### Doctor of Philosophy Degrees

#### August 2014

**Jin Zhang**, "High Pressure Phase Transition of Natural Orthoenstatite and Sound Velocity Measurements at Simultaneous High Pressures and Temperatures by Laser Heating with Brillouin Spectroscopy"

#### December 2015

**Gideon Bartov**, "Mercury Stable Isotope Geochemistry as a Tool for Tracking Sources and Chemical Transformations in the Environment"

**Carly Hill Miller**, "Carbon Cycling in the Caribbean Reef-building Coral *Orbicella*: Quantitative Evidence for Enzymatic Control of Skeletal Density Bonding and Coral-Endosymbiont Physiological Plasticity During Seasonal Environmental Change"

#### May 2015

None

The **2015 Annual Research Review** was held at the Illini Union on February 13th, highlighting research posters from all three departments in the School of Earth, Society and the Environment. This symposium provides students, faculty, and staff with an opportunity to showcase new research ideas in a casual and open environment.

Awards were given to the best posters presented: The Department of Geology awarded Derek Lichter first place for his poster, "Subsurface Flow Driven by Obstacles in a Highly-Permeable Streambed." Melinda Higley's poster, "The Geochemical Archive of Climate Variability in Kiritimati Island Lake Sediment" earned second place, while Laura DeMott took third place with her poster, "Quantification of Dynamic Water-Rock-Microbe Interactions in a Travertine-depositing Hot Spring, Mammoth Hot Springs, Yellowstone National Park, USA."

**Feng Sheng Hu**, formerly an affiliate faculty member and full professor in the Plant Biology department, now has a shared appointment between Geology and Plant Biology, and has been named a Ralph Early Grim Professor of Geology. Hu, currently serving as Associate Dean in the College of Liberal Arts and Sciences, applies lake sediment records to improve understanding of climate and ecological change, particularly in Alaska and the Midwest.

**Alison Anders** has been promoted to Associate Professor.

**Jim Best** received a prestigious Diamond Jubilee Fellowship at the University of Southampton, UK.

**Lijun Liu** was interviewed by Earth magazine, where he discussed the formation of the Hawaiian archipelago.

**Jacalyn Malinowski**, Lecturer in the department since early 2014, was an Invited Lecturer at the University of Illinois at Chicago, and presented "Stratigraphic Paleobiology: Quantitative bathymetric applications and variable marine community patterns across upper Quaternary sequences of the Po Plain, Italy."

**Steve Marshak** received the Department of Geosciences Distinguished Alumnus Award from the University of Arizona.

**Michael Stewart** co-published a paper with professor emeritus Kieffer and undergraduate Steven Battaglia, which won The Paul Pellas-Graham Ryder Award for the Best Student Paper in Planetary Sciences for 2014. This award, which is jointly sponsored by the Meteoritical Society and the Planetary Geology Division of Geological Society of America, is for undergraduate and graduate students who are first author of a planetary science paper published in a peer-reviewed scientific journal. The paper is the culmination of Battaglia's undergraduate thesis and also made the cover of the Icarus volume.

**Sam Heads**, Paleontologist and Curator of Paleontology at the Illinois State Natural History Survey, has become an adjunct professor in the department. Sam earned his Ph.D. in Paleontology, from the University of Portsmouth in 2009, and his research involves insect fossils. He is a Fellow of both the Linnean Society of London and the Royal Entomological Society, and is Editor-in-Chief, of the Journal of Orthoptera Research.

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## Department faculty contribute to major ISGS effort in carbon sequestration

(continued from page 1)

ate the scientific breakthroughs needed to build the 21st-century energy economy. This is the second round of funding for EFRCs, and research supported by this initiative will enable fundamental advances in energy production, storage and environmental mitigation. Thirty-two awards were given out this year and the U. of I. was involved in five of them.

“Managing our nation’s energy needs is one of the most pressing societal issues that we face,” said Peter Schiffer, the vice chancellor for research at Illinois. “I’m proud that the U. of I. is playing such a large role in the important work that will enable new scientific discovery and critical new advances in energy research.”

The U. of I. is a national leader in energy research, a vital area as the world’s population grows and economies become more industrialized. In the face of scientific evidence for human-induced climate change, moves are being made to transition from fossil fuels to renewable sources. But that transition is likely to occur gradually, and in the next few decades, methods to decrease CO<sub>2</sub> emissions via geological storage may be a key part of the picture.

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