SOUTH DAKOTA SCHOOL OF MINES & TECHNOLOGY

2012 Alumni Newsletter

Department of Geology and Geological Engineering

Department of Geology and Geological Engineering – Fall 2012: Left to right: (back row) – Tim Masterlark, Mike Terry, Ed Duke, Darrin Pagnac, (center row) - Kurt Katzenstein, Maribeth Price, Sally Shelton, Alvis Lisenbee, Clint Boyd, Arden Davis (front row) - Nuri Uzunlar, Laurie Anderson (Head) Christina Belanger, Colin Paterson. Absent: Foster Sawyer, Larry Stetler, Perry Rahn, Bill Roggenthen, Jim Fox and Jack Redden.

Department of Geology and Geological Engineering – 1987: Left to right - Standing: Marilyn Lindquist, Bill Roggenthen, Jack Redden, Paul Gries, Jim Papike, Colin Paterson, Jim Fox, Arden Davis, Huseyin Bilgesu. Sitting: Alvis Lisenbee, Perry Rahn and Willard Roberts.

From the Editor – Nuri Uzunlar

Greetings Alumni and friends!
I hope your year was as fun and productive as mine and wish each and every one of you good health and happiness in 2013. The 2012 newsletter is being produced as PDF and DOC and posted on the department's website http://geology.sdsmt.edu. Alumni with emails will be notified that it is on the web page. Please pass this newsletter to other alums you may know without emails. Have a blessed holiday season and a fantastic new year!

From the Head – Laurie Anderson

Dear Alumni and Friends,
It has been an exciting year in the Department of Geology and Geological Engineering. On the academic side, enrollments continue to grow. For fall 2012 we had **187 students in our 5 degree programs**: 65 GEOE BS, 73 GEOL BS, 25 GGE MS, 15 PALEO MS, and 9 GGE PhD students. We are investing in increased graduate-student recruiting efforts at national meetings, and we had a presence at AAPG, GSA, and AGU in 2012. The faculty worked hard in 2011-12 to revamp the course requirements for all degree programs, to streamline time-to-degree, and allow graduate students to tailor their coursework to their research and career interests. Revising all of our degree programs in one year was quite an accomplishment.

Our 2010-11 undergraduates had **100% career placement**, and the average starting salary for GEOE graduates was the highest on campus ($63,000). This fall we had 26 companies, agencies, and schools recruiting our students at the Career Fair and a number of other companies on campus recruiting at other times during the semester. We look forward to seeing more of our industry partners on campus in the spring. The outlook for geoscience and engineering careers is extremely positive, based on reports from several organizations ranging from the US Department of Labor to the American Geosciences Institute. The time is ripe for the department to increase the visibility of the incredible programs and opportunities available to our students, and the great potential that an education at SDSM&T has to launch graduates into great careers.

Both students and faculty have received honors and brought recognition to the Department and SDSM&T in 2012. Here are a few highlights (apologies in advance for omissions!):

- **Henok Tiruneh**, a PhD student working with **Dr. Larry Stetler**, received the **Mines Medal Fellowship** this fall. Tiruneh's research specialization is geological engineering, and in his dissertation he is characterizing rock discontinuities within the Davis Campus on the 4,850-foot level of the Sanford Underground Lab in the former Homestake Gold Mine. He is using fine-scale high-resolution 3D modeling to assess rock properties that will provide data essential to designing large underground excavations, for labs at both the Homestake mine and for other active mining operations.
- **Katherine Aurand** (MS GEOE) received the university's outstanding MS student in the spring.
- Undergraduate GEOE major **Victoria Bierwirth** was selected to represent SDSM&T at the 2012 South Dakota Student Research Poster Session in Pierre in February. She was one of 12 students statewide to present her research. Her research, advised by **Dr. Arden Davis**, uses airborne and satellite imagery to monitor lakes and wetlands during varying climatic conditions and to assist farmers and ranchers assess crops and identify prime grazing areas.
- Sophomore **Evan Doughty** was selected as a GeoCorps Intern for Badlands National Park where he served as quarry paleontologist in summer 2012. Evan also serves as president of the Paleontology Club.
- Faculty, alumni and current students helped make the **joint meeting of the American Institute of Professional Geologists (AIPG) and our own New Horizons in Oil and Gas Conference** a great success, which was held in Rapid City in September. Conference organizers included **Dr. Foster Sawyer** (AIPG's national secretary), **Tom Durkin** (AIPG's South Dakota Section president), and **Dr. Larry Stetler**, and **Dr. Alvis Lisenbee,** who has coordinated New Horizons in Oil and Gas Conference for several years. Mines alumnus **Bill Siok** is the executive director of AIPG.
- Alumnus **Dr. Mark Fahrenbach** (Ph.D. Geol95) was named as the 2012 J.P. Gries Geologist of the Year by the South Dakota section of the American Institute of Professional Geologists in honor of his many contributions in furthering the understanding of the South Dakota's geology. Dr. Fahrenbach is a geologist with the DENR's Geological Survey. The award is named in honor of **Dr. John Paul Gries**, a longtime geology professor at the School of Mines. SDSM&T, Previous J. P. Gries award recipients include State Geologist **Derric Iles**, **Fred Steece** of the DENR's Minerals and Mining Program, and **Drs. James Fox, Alvis Lisenbee**, **J. Foster Sawyer**, **Perry H. Rahn**, **Jack Redden**, and **Edward Duke** of SDSM&T.

One of the most exciting developments in the department this year was a **software gift from Schlumberger valued at $49 million**. Many thanks to our alumni and friends who helped assisted in the grant application process, particularly the efforts of **Dr. Foster Sawyer** and **Steve O'Rourke**. The software will be incorporated into petroleum-related courses and research in the department and represents a significant step in the development of a stronger energy program at the university. The donation includes 20 site licenses, four for faculty and student research and 16 for the department's computer classroom. Software packages included are: ECLIPSE (reservoir simulation); OCEAN (allows users to develop apps to increase functionality of other software packages); Petrel (integrates seismic, well log and other datasets in order to interpret the geology of petroleum fields and reservoirs, and plan for exploration and production drilling); PIPESIM (simulates fluid flow

for petroleum production) and Techlog (analysis of well logs, especially for petrophysics). The software will see use in the spring in courses taught by **Drs. Foster Sawyer, Larry Stetler,** and **Bill Roggenthen**.

A number of new faculty joined the department this year. Associate Professor **Tim Masterlark** brings a dynamic research and teaching program in geodynamics and geophysical modeling to the department. Dr. Masterlark has a PhD. in hydrogeology from UW-Madison, has worked for EROS and most recently as a faculty member at the University of Alabama. **Dr. Christina Belanger** also arrived in fall 2012 as an assistant professor in invertebrate paleontology and micropaleontology. Dr. Belanger received her PhD. from the University of Chicago and came to us from a postdoctoral appointment at the same university. Christina is a field-oriented paleoecologist and paleoclimatologist who uses geochemical proxies to reconstruct regional environmental records. **Dr. Clint Boyd** began this fall as the **Haslem Postdoctoral Fellow**. Dr. Boyd received his Ph.D. from the University of Texas in Austin. Clint's dissertation research is on ornithopod dinosaurs and he also has worked with Badlands National Park for a number of summers. We also just hired **Dr. Christopher Pellowski** to serve as a department coordinator and instructor. Dr. Pellowski recently finished his Ph.D at SDSM&T under the direction of **Drs. Colin Paterson** and **Ed Duke**. Chris will be tackling a number of administrative duties in the department and will serve as a field camp instructor.

Our hiring spree is not done yet! Faculty searches in this academic year include a position in basin analysis and tectonics that **Dr. Colin Paterson** is chairing and an anticipated search in applied geophysics that **Dr. Larry Stetler** is chairing. We welcome nominations for these positions.

We are working to strengthen our relationships with alumni, corporate partners and friends. In 2012 new advisory boards for both the Department and the Museum of Geology formed. Board memberships are listed below. The guidance these bodies are providing is of great help as we build and expand our research and education programs. We are always accepting nominations for membership on our advisory boards.

Geology & Geological Engineering Advisory Board:	Museum of Geology Advisory Board:
Steve O'Rourke, chairman Jeanne Goodman, secretary Richard Arnold Sherwin Artus Barbara Beasley Tom Bidgood Jonathon Bloch Paul Ching Scott Foss William Gates Ahmad Ghassemi David Hammond Paul Murphey Ray Wuolo	Sue Ann Bilbey Brent Breithaupt Michael Catches Enemy Mark Fahrenbach Charlene Foster Jennifer Fowler Jhon Goes in Center Eric Grimm Mary Kopco Beverly Lingle Roger Portell Michelle Thomson

We also appreciate the service that our adjunct professors provide. In 2012 we were honored to have **Drs. Mark Anderson** (US Geological Survey), **Rachel Benton** (National Park Service), **Derric Iles** (SD Geological Survey), **Andrew Long** (US Geological Survey), **Kelli McCormick** (SDSM&T Mining Engineering and Management), and **Bill Roggenthen** (SDSM&T Research Affairs) serve as adjunct faculty.

Finally, I would like to list scholarship and other award recipients for 2012-13. Thank you to our alumni and corporate partners who are providing the funds to allow us to support and recognize our students. I hope I haven't missed any!

Sherwin J. Artus	**Drew Felton** (BS GEOE) **David LaPorte** (BS GEOE) **Melissa Heron** (BS GEOE)
Macy Baresch	**Brandon Richardson** (BS GEOL)
Barrick Gold	**Samantha Sarac** (BS GEOE) **Steve Mezger** (BS GEOE) **David LaPorte** (BS GEOE) **Zachary Lampert** (BS GEOE) **Matthew Orr** (BS GEOL) **Brandon Richardson** (BS GEOL)
Jeff L Bauer Memorial	**Zachary Lambert** (BS GEOL) **Andrew Warren** (BS GEOL) **Kimberly Berry** (BS GEOL)
Bittner-Campbell Memorial	**Melissa Heron** (BS GEOE)
Carver Cornelissen	**Kathryn Dorfschmidt** (BS GEOE)
CH NSFS-Native American (field camp)	**Melissa Heron** (BS GEOE)
Joseph P Connolly	**Conner Brightwell** (BS GEOL)
Homer Davis Memorial	**Jordan Richey** (BS GEOE)
Gregory French	**Rachel Pate** (MS GEOL)
General Scholarship Fund	**Chase Cimburek** (BS GEOE)
Paul and Virginia Gries	**Cody Schlecter** (BS GEOE) **Rachel Brunstad** (BS GEOE) **Randi Feist** (BS GEOE) **Derek Hendricks** (BS GEOE) **Meramph Amare** (MS GEOE) **Michael Tekle** (MS GEOE) **Katherine O'Rourke** (MS GEOL) **Katherine Aurand** (MS GEOE) **Yodit Asmare** (MS GEOE) **Henok Tiruneh** (MS GEOE) **Erik Smith** (MS GEOL) **Michael Calvello** (PhD GEOL) **Sydney Boos** (MS PALEO)
Paul and Virginia Gries (for field camp)	**Clinton Koch** (BS GEOL) **Brandon Richardson** (BS GEOL) **Drew Felton** (BS GEOE)
KGHM International LTD	**Joshua Barth** (BS GEOL)
Joseph and Josephine Kulik (for field camp)	**Melissa Heron** (BS GEOE)

Dr. Ray Lemly Memorial (for field camp)	**Alaina Fike** (BS GEOL)
McGillycuddy Departmental Service Award	**Andrew Armstrong** (MS GEOL)
John C. Mickelson	**Joseph Gandolfi** (MS PALEO)
Jack A. Redden (outstanding geology senior)	**Benjamin Zalneraitis** (BS GEOL)
Roy Roadifer	**Joseph Hunter** (BS GEOE) **Brenden Sullivan** (BS GEOE) **Miranda Stefanich** (BS GEOE) **Tait Earney** (BS GEOL) **Jarek Haverluk** (BS GEOE)
Bill & Jean Roberts	**Clinton Koch** (BS GEOL)
Bill & Jean Roberts (given by the Western Gem & Mineral Society)	**Joshua Barth** (BS GEOL)
Seth Schaefer	**Christopher Schiller** (BS GEOL) **John Scott** (BS GEOE)
John Scully Foundation	**Lander Solon** (BS GEOL; BS PHYS) **Rebekah Benn** (BS GEOL) **Sara Gross** (BS GEOL) **Abigail Hogan** (BS GEOL) **Matthew Johnson** (BS GEOL) **Michael Bosch** (BS GEOE) **Anders Schappert** (BS GEOL) **Brandon Richardon** (BS GEOL) **Conner Brightwell**(BS GEOL) **James Mishoulam** (BS GEOL) **Brianna Powell** (BS GEOL) **Joshua Laird** (BS GEOL) **Houston Wagner** (BS GEOL) **Morgan Ekmark** (BS GEOL) **Harry Adams** (BS GEOL)
Edward L. Tullis (outstanding geological engineering senior)	**Derek Morris** (BS GEOE)
Woman's Auxiliary to the American Institute of Mining, Metallurgical and Petroleum Engineers	**Nathan Hansen** (BS GEOL) **William Lichtenwaldt** (BS GEOE, BS MINE) **Kelsey Marzolf** (MS GEOL)
Outstanding SDSM&T Master's Student	**Katherine Aurand** (MS GEOE)
SDSM&T Mines Medal Fellowship	**Henok Tirenuh** (PhD GEOE)

Senior Research Projects

Clinton Koch	Investigation into the Cause of a Large Magnetic Anomaly in Southeastern South Dakota
Brandon Richardson	Diversity of Fossil Fish in the Pierre Shale (Late Cretaceous) of Western South Dakota
Mark Mayfield	Geologic Mapping of the Grace Coolidge Site
Alana Kightlinger	Mineral analysis and petrography of igneous samples from varying tectonic regions in the Bolu and Eskesehir Provinces, Turkey
Patrick Chalupsky	Hydrocarbon Evaluation of the Niobrara Formation in North-Western South Dakota
Alaina Fike	Hipparionine Horse Teeth: The Relationship Between Protocone Shape and Pli-Caballin Complexity
Alexis Godeke	Identifying species of *Camarasaurus* using a morphometric analysis of scapular data
Scott Thofern	Porosity Properties of Cone 9 Stoneware Clay
Matthew Orr	Petrographic Analysis of the Deadwood Standard Prospect, Lawrence County, South Dakota
Jonathan Myers	Petrography and Dating of Unknown Mafic Intrusions form South Eastern South Dakota

I look forward to meeting more Geol/GeoE/Pale alumni and friends in the next few months.

All the best,

Laurie C. Anderson
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Director, Museum of Geology
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From Our Emeritus Professors:

Perry Rahn

Perry Rahn is still busy cutting down trees infected with the "Mountain Pine Beetle". The overall long term predictions for bark beetles in the Black Hills is rather dismal, actually. Other than that, Perry keeps some research going and is writing a paper about ground water recharge in metamorphic rock terrain.

Jim Fox

Jim is Emeritus Curator of Invertebrate Paleontology. Jim continues research on the subsurface geology of South Dakota as related to petroleum in the Williston Basin. He is also assisting with the curation of invertebrate fossils in the Museum of Geology.

Jack Redden

Jack is still active in research on various issues relating to Precambrian geology of the Black Hills. He spends winters in Arizona with his daughter.

Bill Roggenthen

Bill Roggenthen has continued work at the former Homestake Mine where the physics experiments are building infrastructure on the 4850 level. This has included studies of pillar deformation and a continuing buildout of the seismic detection and characterization system that is currently located on the 4100 level. Over the past summer he traveled to China to review laboratories and, as part of that work, visited one of the largest open mines in Asia to examine ground stability monitoring instrumentation. The trip also presented the opportunity for other activities such as climbing the Great Wall near Beijing. This brought home the meaning of the phrase "China mists" because of the heat and humidity of the summer produced a surreal environment with the Wall poking out of the clouds. Upon return to Beijing that same day, we were greeted by a storm that produced the largest rainfall in the area in the last 62 years and were able to see how the infrastructure handled such a downpour (reasonably well in the area where we were located).

Alvis Lisenbee

Another year has passed and I'm not quite certain where it went. This one had many of the usual things in it, however, e.g., geological quadrangle mapping in the Black Hills (it was going well until I got to the Precambrian part), teaching in the summer field camp in Turkey (it is amazing the effect ear pods plugged into an IPod have on removing students from the world around them) and doing a bit of writing (one paper on work in New Mexico will be out in a January GSA Special Paper).

For the fall I led a group (including Foster Sawyer, graduate student Vanja Stevanovic and alums Steve O'Rourke and Lorin Brass) in preparing the annual Oil and Gas Conference with is normally held on the Mines campus. This year, we joined with the annual conference of the American Institute of Professional Geologists: the joint conference contained a wide range of talks and many field trips to see aspects of Black Hills geology. Colin Paterson and I led a trip to view Tertiary plutons and mineralization in the Bear Lodge Mts. and Devils Tower of Wyoming. One of my first graduate students, Dick Larsen, introduced the group to the efforts of Rare Element Resources to bring on-line a rare-earth mine in the Bear Lodge. Dick has returned to the Black Hills to participate in this effort, continuing a successful mining career in the western U.S.

Following the Oil and Gas Conference, Nuri Uzunlar and I travelled to Turkey for an exploration of additional possibilities for summer field camp activities there. We travelled from Istanbul in the west to the eastern border with Georgia, examining the Pontid island arc – and enjoying the Turkish cuisine and the beautiful fall weather. I am increasingly amazed with the changes that country is undergoing. When I first travelled there in the late 1960's Turkey was essentially a 19th century world with some Mercedes trucks. In the past 15 years it has become a dynamic example of economic and political growth. One example that was so clear to us on this trip is the development of a major highway network, based upon the use of taxes derived from $10 per gallon gasoline. One example is in the mountains of the Pontid island arc, parallel to the east trend of the Black Sea coastline. On the southern, rain shadow side of this four kilometer tall range, a deep gorge carries the Choruh River, formerly the grandest of the wild river canyons of Turkey. To help fill Turkey's need for electrical power (the industrial sector is advancing faster than such power can be generated), numerous dams are under construction here and the
old, bumpy highway, which followed the stream, will be no more. As this is a major artery for commerce with the coast, a new highway is being construction along, and through, the canyon walls (as shown in the photo above). I suspect that this system will soon be recognized as one of the world's engineering marvels, built entirely by Turkish firms.

In addition to such wanderings, work with graduate students Katie Aurand, Jennifer Bednar and Micheal Tekle continues regarding water resources in the crystalline rocks of the Hill City-Keystone area. This is an enjoyable project, combining the growing skills of the students with the mature ones of Dr. Davis (doing the real ground water part) and Dr. Price (leading us in the GIS world). I'm pretty much along to think about the fractures which contain the water. We are fortunate to continue to have the support of the West Dakota Water Development District for this work.

Micheal Tekle has also been the GIS portion of a look that I have started on the structure of the Chadron arch of Nebraska, using structure contours on the Niobrara Formation. It is great to have good graduate students to guide one in the technology world.

And so, on to 2013……..

From the Faculty:

Arden Davis

During the past year I continued to teach geological engineering courses in the areas of ground water, geochemistry, and engineering design. My current research focuses on ground-water protection, aquifer vulnerability, water quality, and removal of arsenic and heavy metals from drinking water. In research during the past year on water quality, I worked with Dr. Alvis Lisenbee and Dr. Maribeth Price. In my arsenic research, I've continued to collaborate with Dr. David Dixon (Chemical Engineering), Dr. Cathleen Webb (Western Kentucky University), and Dr. Jenifer Sorensen (RESPEC). We've received a patent for removal of arsenic with limestone-based material, and we've applied for a patent for removal of heavy metals. Recently we also formed a company, CalxAqua, in hopes of making the process commercially viable.

I'm continuing to serve on the ABET Board of Directors as well as various accreditation and education committees within SME. If any graduates are interested and willing to consider becoming an accreditation evaluator for geological engineering programs, please let me know.

Many of you know that my wife and I enjoy spending time at our farmstead in Minnesota. Last summer we had a great crop of sweet corn, despite the dry weather in the region.

During the past year, it was enjoyable to hear from many alumni who visited. If you're in the area, please stop by.

Larry Stetler

In 2012 I have taught 8 courses, am major advisor to 4 MS GeoE students and 3 PhD GeoE students, supported 2 additional MS students, and 1 BS undergraduate student. I have served on the committees of several other students as well. So far this year, two manuscripts have been published and 3 additional manuscripts have been accepted for publication (I need to find time for the corrections!). I have 2 funded research projects and currently am writing parts of 2 new research proposals. I serve on numerous campus committees, the Faculty Senate, and sit on 1 and chair another faculty search committee. I am looking forward to the winter break!

This past year, the department has received generous software gifts from Schlumberger and NuralLog that now enable us to perform world-class reservoir modeling, construct geologic models, develop production scenarios, and many other items relating to petroleum exploration, development, and production. I have attended 1 professional training session to start the journey toward proficiency using these programs. A lot of late afternoons have been spent working with these programs and developing a database for SD that will be used for assessments of various potential petroleum systems in the state.

My kids are going to school in Hermosa, a small town about 15 miles south of Rapid City. Morgan is 11 and in 5th grade. She is in piano and still loves to dance. Briggs is in kindergarten which is a full day now, so I drop them off in the AM and my wife picks them up in the PM. They both played on ball teams last summer, Morgan was in softball and Brigg's did his 1st year of T-ball.

Kurt Katzenstein

Happy holidays to you and your family, I hope all is well and that you had a fruitful and enjoyable 2012. It was another busy year for me both personally and professionally as I balance life as the father of two wonderful daughters with the rigors of being an untenured faculty member working his way (hopefully) towards tenure. Our older daughter, Brianne will turn three on December 30th and continually amazes me with her

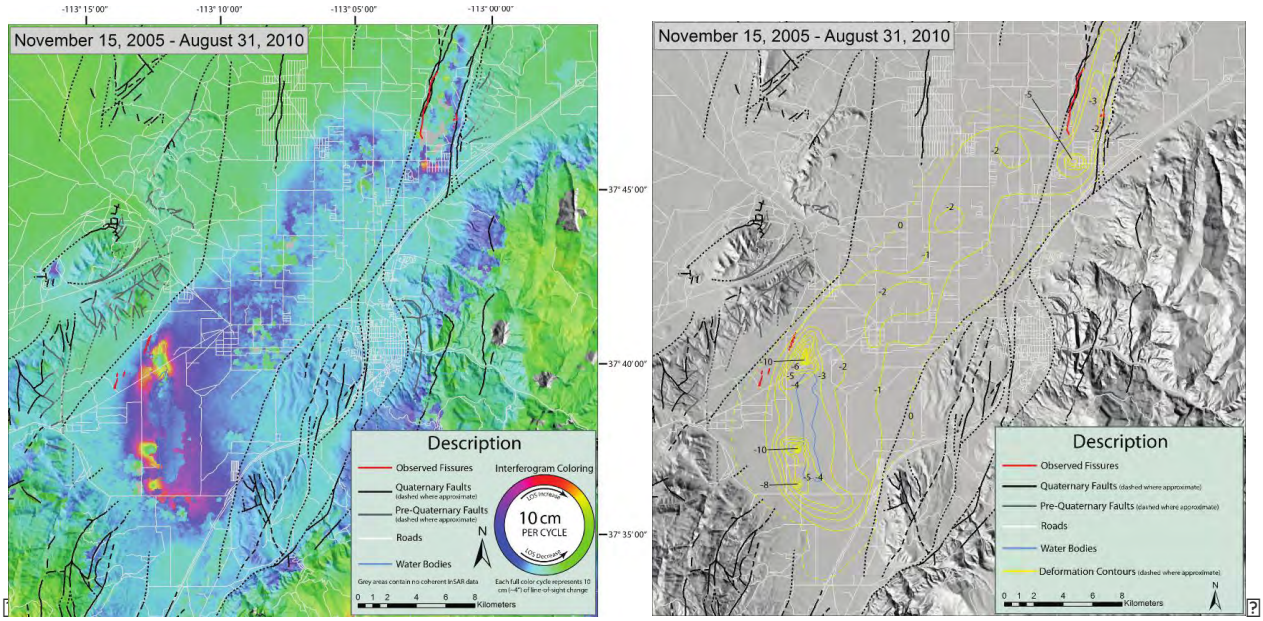
development as a person. She is always surprising me with things that she fully comprehends and shows a passion for life that is inspiring and grounding all at once. These days she is hooked on puzzles and enjoys playing with her matchbox cars (no Barbies for this one…yet). Our younger daughter Hannah (18 months) is talking more and more and is now extremely mobile! Her favorite thing to do these days is to look out the window of our living room at the deer and turkeys as they wander through our front yard. I bet she was one of the few 1 year olds whose earliest words included "deer" and "turkey." She is also fearless, which keeps us very busy when we go the park and she climbs willy-nilly up playground equipment.

The Tech Geological Association (TGA) had another successful year. We took a camping trip to Wind Cave National Park, hiked up Harney Peak, went curling with some help from the Rushmore Curling Club (thanks RCC!), went to the Mammoth Site, hosted the annual Ice Fishing Extravaganza, talked to young budding scientists and engineers at the Corral Drive Elementary School Science Night, remained undefeated in the TGA/SEG/Paleo Club bowling challenges, partook in the Sturgis High School Career Fair, and other fun events.

This year I taught four classes; Geology for Engineers, Engineering Geophysics, Introduction to Geological and Mining Engineering and Environmental and Engineering Geology. I also helped out at the Engineering Field Camp for about two weeks during the summer. I am continuing to upgrade my growing Geomechanics/Slope Stability laboratory and have integrated the equipment into course labs. This spring I hope to receive funding to acquire some state of the art fiber optic strain sensing equipment to be used in future research endeavors.

My Interferometric Synthetic Aperture Radar (InSAR) research is still going strong. This year I presented results at AEG in Salt Lake City, GSA Rocky Mountain Section in Albuquerque, AGU in San Francisco, and attended the ARMA conference in Chicago. The presentations detailed results from subsidence studies resulting from Coal Bed Methane subsidence in the Powder River Basin, WY and San Juan Basin, CO/NM, as well as agricultural

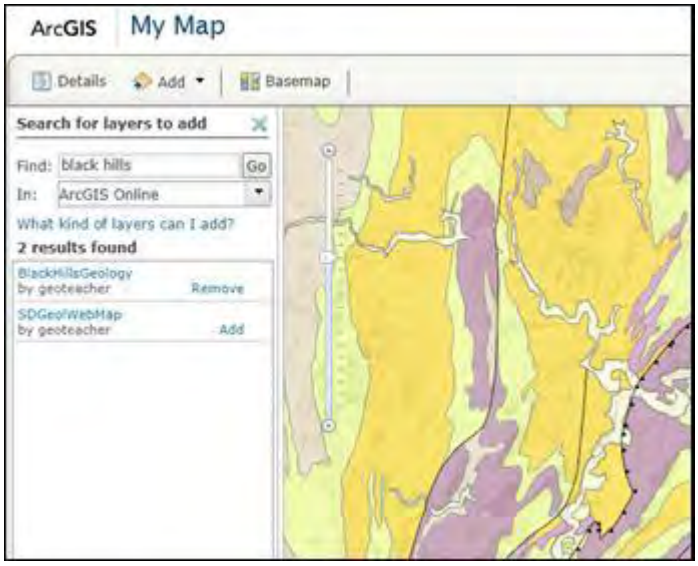
and municipal water use in the Cedar Basin of Utah (this will be published as a Utah Geological Survey Miscellaneous Publication in the coming months, figures below).



Maribeth Price

Hello alumni! It has been a busy year. Many new developments are happening in the GIS world, and folks like me are struggling to keep up.
It seems like clouds are gathering everywhere now, and by "clouds" I mean those nebulous Internet-based computing resources that are mysteriously "out there" and which everyone is trying to sell you as

backup space and the ability to magically put your music on six devices at once. GIS is no exception, it seems. The latest development is something called ArcGIS Online, and it is actually pretty cool, especially if you are not a GIS person but want to easily access topo maps, air photos, and street maps. You can plot your own data on these, and even create mashups to share with others. It's free, and pretty easy. I encourage you to try it out by going to ArcGIS.com. Choose "Maps for Personal Use" near the bottom of the screen and then "Make a Map" to get started. Explore the different basemaps, which include street maps, aerial photography, and USGS topo quadrangles. Click Add and Search for layers. Type in "black hills" to find two maps hosted by SDSMT: the Black Hills Geology map by Redden and DeWitt, and the South Dakota State Geological map by Martin et al. We will be adding more maps as time goes by, and developing student, alumni, and research groups.
I was lucky enough to get a Nelson Research Award for this year, and am working with



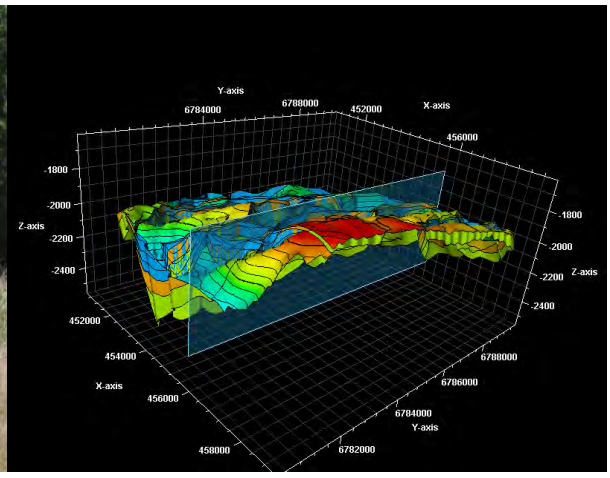
graduate student Bethany Costello on a project to explore the use of close-range photogrammetry to document paleontological digs. Our test bed is the Mammoth Site of Hot Springs, SD. Bethany took thousands of photos of the bone bed during the summer and is working to develop the 3D models from them. It is our goal to demonstrate that this technique is useful for documenting progress on digs as well as making measurements. And in keeping with the cloud theme, the sets of photos are so large that we are looking at cloud computing as the best way to generate the models.

In the Museum of Geology, the map inventory is proceeding slowly. We have cataloged about 3500 maps so far, and are starting to get an idea of our holdings. We have maps as old as the 1860's in our collection, with the majority of them published between 1940-1970. We will be working to get the catalog online as soon as we can so that researches can canvass our holdings. Finally, the 6th edition of my text, Mastering ArcGIS is in final editing stages and will be available in March 2013. It is always a relief to get another edition finished.

Wishing you all a happy holiday season and a great 2013!

Foster Sawyer

Greetings alumni, students, colleagues, and friends of the Department! What an amazing year it has been, filled with student activities, research, a major software donation, organization of a national conference, and many other exciting events. Our department continues to grow in new directions, and for me that has included working to further develop the energy focus area in our curriculum through the reintroduction of an upper level petroleum geology course and through the acquisition of computer software. The department recently was the recipient of a major software donation from Schlumberger Ltd. which included Petrel, Eclipse, PIPESIM, Techlog, and others. The addition of these state-of-the-art software tools to our courses and research provides our students with much stronger preparation for careers in the petroleum industry and at the same time greatly increases our research and analytical capabilities. We had a lot of help from our alumni and colleagues with Schlumberger Ltd. throughout the donation request and software acquisition, and I want to offer my sincere thanks to all of these kind and helpful people.



A. Mapping the White Clay fault on the Pine Ridge Indian Reservation at 112°F. Pictured from left to right are Jim Sanovia, Michael Dubray, Kristina Proietti, and Grace Sumption. B. Three dimensional subsurface view obtained from Petrel software.

Our cooperative project with Oglala Lakota College (OLC) and South Dakota State University continues to be highly active with research and education projects on the Pine Ridge Indian Reservation including geologic mapping of the White Clay fault, investigation of water quality of the White River and other streams, and a variety of other projects ranging from box turtles to wind energy. Highlights this year included approval of a new articulation agreement between SDSM&T and OLC and having several of our students win prizes during the student poster contest at the annual conference of the American Institute of Professional Geologists. Another cooperative project with Sinte Gleska University, Rosebud Indian Reservation, also is moving forward with evaluation of the Niobrara Formation with respect to hydrocarbon potential in south-central South Dakota.

The Department of Geology & Geological Engineering also was honored to host the 2012 Annual Conference of the American Institute of Professional Geologists in conjunction with our annual New Horizons in Oil and Gas Conference. This joint conference brought professional geoscientists from across the nation to South Dakota which provided a wonderful opportunity for our students to network and for us to showcase the department at a national venue. Over thirty of our students participated as volunteers or presenters, and I received numerous compliments and positive feedback regarding the caliber of our students. Overall, participant responses indicated that it was an outstanding conference with many people commenting in particular about the quality of the field trips that were offered.

Other highlights of the past year include our student organizations which continue to be quite active, a trip to Mongolia this past summer, and all of the exciting research that is occurring around the department. For the sake of brevity, I'll forego descriptions of the various research projects in which I am involved, and will simply list some of the publications (below) that resulted from this year's work. In closing, I want to thank all of the alumni, students, and friends of the department who have supported us so steadfastly over the years, and without whom we could not continue to grow and stay abreast of the fields that we teach. Your support is greatly appreciated!

Fick, D., Sawyer, J.F., Tinant, C.J., and Berdanier, B., 2012, Civil and geological engineering service-learning projects as part of a pre-engineering education collaborative: 2012 Frontiers in Education Conference Proceedings, Seattle, WA, Oct. 3-6, 2012.

Marnach, N.M., Benning, J., Kenner, S., Sawyer, J.F., 2012, Education for the Protection of Water Resources on the Pine Ridge Reservation [abs]: 2012 Western South Dakota Hydrology Conference, April 19th, 2012, Rapid City, South Dakota.

Marzolf, K.R., and Sawyer, J.F., 2012, Hydrocarbon potential of the Niobrara Formation on the Rosebud Indian Reservation, South Dakota [abs]: American Institute of Professional Geologists Annual Conference, Rapid City, SD, Sept. 22-26, 2012.

Morton, M., Garraffa, A., Stevanovic, I., Sawyer, J.F., Lisenbee, A.L., and Jenkins, C., 2012, GIS application to stratigraphic/petroleum analysis, along the Powder River basin-Big Horn uplift margin [abs]: American Institute of Professional Geologists Annual Conference, Rapid City, SD, Sept. 22-26, 2012.

Proietti, K.A., and Sawyer, J.F., 2012, Investigation of the White Clay fault as part of a new STEM education program at the Pine Ridge Indian Reservation, South Dakota [abs]: American Institute of Professional Geologists Annual Conference, Rapid City, SD, Sept. 22-26, 2012.

Singh, S.K., Sawyer, J.F., and Marzolf, K.R., 2012, Multi-phase fluid flow simulation assisted exploration and production of hydrocarbons from the Niobrara Formation in the northern Great Plains [abs]: American Institute of Professional Geologists Annual Conference, Rapid City, SD, Sept. 22-26, 2012.

Singh, S.K., Malviya, P., Sharma, P., and Sawyer, J.F., 2012, Technology and effects of guar gum processing on global fracturing operations in the oil and gas industry [abs]: American Institute of Professional Geologists Annual Conference, Rapid City, SD, Sept. 22-26, 2012.

Stamm, J.F., Hendricks, R.R., Sawyer, J.F., Mahan, S.A., Zaprowski, B.J., Geibel, N.M., and Azzolini, D.C., manuscript accepted, Late Quaternary stream piracy and fluvial terrace formation along the Belle Fourche and lower Cheyenne Rivers, South Dakota and Wyoming: Geomorphology.

Tim Masterlark

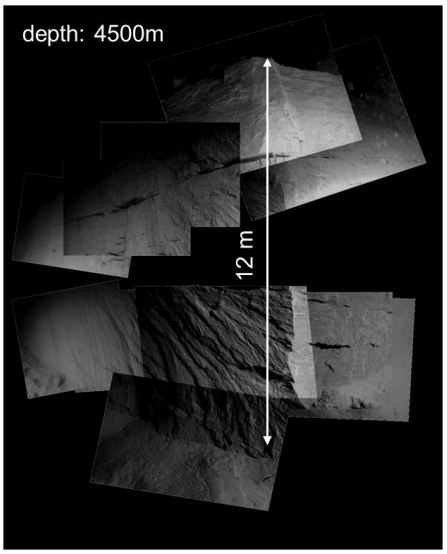
I resigned my position as a tenured Associate Professor at The University of Alabama and joined the GGE faculty in Fall 2012. Although the transition was complicated, the process was remarkably painless. The only real casualty of the transition was that I had to cancel an invited presentation for a conference in Germany that conflicted with the movers' schedule.

My specialization is Geodynamics and I am perhaps best described as a modeler. I am particularly interested in fluid-solid coupling processes (e.g., magma propagating through dikes, earthquakes triggered by fluid pressure, and tsunami genesis), as well as inverse methods that quantify tectonic processes at depth (fault-slip or magma intrusion) based on observed surface deformation. I am building a research team at SDSMT that develops Abaqus-based finite element models (FEMs) to simulate deformation of active volcanoes and earthquakes. In support of this initiative, I am equipping a laboratory with high performance workstations that take advantage of recent breakthroughs in multi-core parallel processing and GPU acceleration. In addition to the transition to SDSMT, this year included several highlights.

Kurt Feigl and Cliff Thurber (University of Wisconsin) and I solved the particularly difficult problem of embedding FEMs of volcano deformation directly into nonlinear inverse analyses of geodetic (InSAR) data. The details of this NSF-sponsored study were published in the *Journal of Geophysical Research*. The methods we developed allow us, for the first time, to unify the traditionally disparate fields of seismic imaging and geodesy for quantitative analyses of active volcanoes.

Stephan Grilli (URI) and I are working on an NSF-sponsored project to study deformation and tsunami genesis of the M9 2011 Tohoku Earthquake, Japan. The magnitude and scale of this event, combined with the excellent instrumentation of Japan, comprise a peerless natural laboratory for tectonic hazards research that captured much of my attention and energy during the past year. Our numerical simulations of seafloor deformation and tsunami genesis accurately predict tsunami run-ups observed along the entire coast of northern Japan. This study was published in a special issue of *Pure and Applied Geophysics* that was dedicated to the earthquake and I was invited to give a presentation of this work at the AGU Fall Meeting 2012. Additionally, my international colleagues and I published articles in *Journal of Seismology* and *Computers in Geoscience* for other earthquake and volcano deformation targets.

Finally, I recently received welcome news from NASA –My proposal to the NASA Earth Surface and Interior Program was selected for funding. This collaborative project with Gilles Peltzer (NASA JPL) will combine InSAR with FEMs of earthquake deformation to study the role of pore fluids in post-seismic deformation and earthquake triggering. A postdoc will join my research team at SDSMT to support the project in Spring 2013. Two graduate students, Ted Donavan (Ph.D.) and Mike Baranowski (M.S.), will join my research team in Spring 2013 to develop numerical simulations of the M9 2011 Tohoku Earthquake and Tsunami.



(left) Dr. Masterlark, aboard Oceaneering's *MV Performer* during the SEATOS Expedition to the Indian Ocean, directing the Remote Operated Vehicle (ROV) as it probes the Sunda Trench. (right) Photomosaic assembled from ROV images showing a 12 meter scarp that formed during the M9 2004 Sumatra Earthquake. This scarp provided important constraining information for numerical simulations of the earthquake and tsunami, which killed more than a quarter-million people.

Christina Belanger

I have just completed my first semester as an Assistant Professor in Geology at the School of Mines, so I should introduce myself. My main research is in biotic responses to climate change and as such I combine paleoecology with paleoclimate. I work primarily with Cenozoic marine molluscs and benthic foraminifera, which are not only abundant and well-preserved in fossil records, but also record information about temperature, nutrient resources, and oxygenation of their habitats in the chemistry of their shells. By studying past ecosystem change and their environmental drivers, we can begin to understand the consequences of modern climate change and perhaps learn how to lessen its impact. (If that peaked your interest, check out my PloS One paper available freely online: **http://tinyurl.com/ctmy44l.**)

I've worked on fossil deposits from the coast of Oregon and California and am eager to look at marine communities in the local Cretaceous shales. This summer I will be joining the Integrated Ocean Drilling Program on their ship the JOIDES Resolution for a two-month research cruise to the Alaskan Margin. There we will core Pleistocene marine sediments and use them to reconstruct paleoceanographic changes near Alaska over the last ~15,000 years.

I grew up in California and completed my undergraduate work in the College of Creative Studies at the University of California, Santa Barbara. Then I moved to the University of Chicago for graduate work where I completed a Ph.D 2011. I stayed on at UChicago for post-doctoral research on the oceanographic controls of the biogeography of marine organisms and then began my position here in August 2012. This semester I taught "Search for Our Past" and will teach Invertebrate Paleontology in the spring. I am enjoying how bright and hard working the undergraduates are here and look forward to continuing to work with them. I am also beginning to work with paleontology graduate students and they are helping familiarize me with some of the local geology.

My office is in the Paleontological Research Laboratory where we are also working on building an analytical geochemical laboratory. Installation of a new "clean room" fume hood and cabinetry will begin this December. These new facilities will allow us to prepare fossils in-house for analysis of geochemical proxies of environment and diet.

Photo Caption: Christina's field site along the coast of Oregon near Newport. The sediments of the Newport Member of the Astoria Formation are 20-16 million years old and record biotic responses to a past global warming event.

Ed Duke

Ed Duke spent much of 2012 in activities related to the Engineering and Mining Experiment Station (EMES) and the South Dakota Space Grant and NASA EPSCoR programs.

Darrin Pagnac

The past year has been a bit more challenging than most, both professionally and personally. The most demanding aspect of the past year has been the aftermath of a severe injury to my right shoulder (at the hands of a forty-year old still trying to do jiujutsu) and subsequent surgery in May. The next six weeks were spent in recovery and the following five months in intensive physical therapy. Although the prognosis is very good and I've mended nearly completely, this setback had a significant effect on my progress this year. I still managed to get out in the field a bit while in a sling and I'm certain my students are already telling stories about how their advisor is tougher than everyone else's. Incidentally, I have not discouraged these stories and have maybe added a few elaborate embellishments of my own.

Despite my temporary limitations, I did attend and host one of the finest field camps I have ever been a part of in late May. In collaboration with Bob Hunt, retired paleontologist with the University of Nebraska, Lincoln, several faculty, staff, and students spent two weeks at Agate Fossil Beds National Monument north of Scottsbluff, Nebraska. Agate Fossil Beds contains one of the most complete assemblages of early Miocene mammals in the world. We were lucky enough to be led through the Monument by Dr. Hunt who has spent

the last thirty years of his career researching the intricacies of the stratigraphy and paleontology. The trip sparked a Master's project that my student, Joe Gandolfi, will be completing in the next year.

In March I returned to the site of my dissertation work in the Mojave Desert after a seven-year hiatus. I met up with colleagues from the University of Oklahoma for a brief visit to the Barstow Formation in Rainbow Basin, California. March in the Mojave can be a bit tricky, but despite a few sandstorms and seventy mile-per-hour winds we had a fantastic and productive trip. I am currently reviving some old projects in that area and will hopefully have updates for you soon.

Camp in the Mojave Desert and Owl Canyon Campground north of Barstow.

The only way to get around in the desert.

We look forward to new field camps in 2013, including a return to our Jurassic Morrison Formation quarry near Sundance, Wyoming, and a new camp in the White River Badlands conducted by our new postdoctoral fellow, Dr. Clint Boyd. Check the Museum of Geology website for additional details (http://museum.sdsmt.edu/).

Research has taken a boost and I've made some significant progress this year. I published a description of new mammalian fossils from the middle Miocene Fort Randall Formation of South Dakota in July. In this paper I described the remains of a few new fossil mammal occurrences in South Dakota, including the first record of proboscideans (mastodons and elephants) in the state. My doctoral student, Huai-Pin Hu, and I, along with several co-authors, submitted the first of many papers on our work on Pleistocene mammals of Taiwan. Unfortunately, you'll have to wait for additional details pending official publication. Finally, I am finishing up a manuscript with a colleague from the New York State Museum. In this study we've analyzed the carbon and oxygen isotopic signatures of several groups of herbivorous mammals from Miocene deposits in the Mojave Desert (the Barstow Formation). Data from the horse teeth revealed a carbon signature indicating these animals were consuming some of the earliest modern C4 grasses in North America. We presented these findings at the annual Society of Vertebrate Paleontology meeting in Raleigh, North Carolina, and are finalizing the manuscript for publication.

I've finished up some notable funded research projects this year. In collaboration with Sally Shelton, we utilized funds from a Paleontological Society Education and Outreach grant to build some portable teaching kits with our student paleontology club. In October, we debuted one of these kits in one of Jennifer Fowler's 8th grade classes at South Middle School. The kit, outlining the different types of dinosaurs that existed in each period of the Mesozoic Era, was a huge success. The data, acquired from approximately 140 student participants, showed that the kits not only effectively presented the information but that the students retained the material as well.

Sally Shelton and I have also finished up a National Park Foundation Impact Grant in collaboration with Dinosaur National Monument in Utah. Sally and I, along with my Master's student Julie Rozen, made two trips to the Monument in April and November. We are observing the environmental conditions associated with the Carnegie Quarry (within the new Quarry Visitors' Center enclosure) to determine the average temperature and humidity variations throughout the day and year. These data will then be used to adjust the Monument's long-term conservation plans for the site. The trips spawned another research project involving the microstratigraphy and deposition of this world-famous quarry, and my student Julie Rozen is enthusiastically pursuing the project.

As always I have been lucky to interact with many, many bright, dedicated and wonderful students the past year. Their enthusiasm and brilliance never ceases to amaze me. This December I graduated my first Master's student in a few years. Ms. Bevin O'Grady finished her thesis comparing the Oligocene horses *Mesohippus* and *Miohippus*. I wish Bevin the proudest of congratulations and look forward to her future professional progress.

Michael Terry

This was another busy year for me. In addition to teaching the normal courses, Dr. Larry Stetler and I organized a spring trip to Hawaii that visited three Islands and I taught ten weeks of field camp at Ranch A. During field camp it was a pleasure of working with Doctors Kelli McCormick, Randy Kath, Can Denizman and M.S candidate Rebecca Anderson. Work with M.S. students Al Garaffa, Andrew Clift, Chris Nichols and Joseph Zeitler resulted completion of their theses:

Clift, A., 2012, Kinematic and structural development of Crazy Woman Mountain, Bighorn Mountains, Wyoming , South Dakota, M.S. Thesis: South Dakota School of Mines and Technology, 60 p.
Garaffa, A., 2012, Exhumation of medium-pressure metamorphic sole within a high-pressure region: the Izmir-Ankara suture, Orhaneli area, Turkey, M.S. Thesis: South Dakota School of mines and Technology, 75 p.
Nichols, C., 2012, Comparison of fracture orientation data using LiDAR and traditional techniques and a geologic map of the Rochford Quadrangle, South Dakota, MS Thesis: South Dakota School of Mines and Technology, 57 p.

Zeitler J., 2012, Structural Controls on Gold Mineralization, Middle Zone, Cortez Hills Deposit, Lander County, Nevada MS Thesis: South Dakota School of Mines and Technology, 57 p.

Efforts were continued on recovering structural histories metamorphic rocks that have been completely recrystallized with a colleague Dr. Florian Heidelbach. We submitted the following manuscript.

Heidelbach, F. and Terry, M., Submitted, Inherited fabric in an omphacite symplectite: reconstruction of plastic deformation under ultra-high pressure conditions, Microscopy and Microanalysis.

Thanks the work of Samantha and Chris Nichols and Dr. Maribeth Price, Dr. Alvis Lisenbee, Dr. Jack Redden and Dr. Mark Fahrenbach geologic maps of two quadrangles were submitted to the State Geologic Survey for publication. These include:

R.W. Bayley, R.W., McGehee, R.E., Redden, J.A., Nichols, C.E. and Terry, M.P., Submitted, Geologic Map of the Rochford Quadrangle (1:24000), South Dakota.

Norton, J.J., Redden, J.A., Saxton, S.L. and Terry, M.P., Submitted, Geologic Map of the Mount Rushmore Quadrangle (1:24000), South Dakota.

I wish all our alumni a happy and productive 2013.

Colin Paterson

One Ph.D. student (Chris Pellowski) completed his study of spectroscopic characterization of the Navachab gold deposit in Namibia. Two M.S. students are beginning ore deposit research, one on drill core in mafic intrusions in the basement of SE South Dakota and their potential for PGE-Cu-Ni mineralization, and another on mineralogy and alteration in the intrusion-hosted gold ores at the Wharf Carlin-like gold deposit in the northern Black Hills. Another M.S student is almost finished an alteration study in the biotite zone host rocks in the Homestake gold deposit.

I attended the Institute of Lake Superior Geology Annual Conference in Thunder Bay (Ontario) in May, presented a paper with Dr Kelli McCormick on “Mafic intrusions along the southern boundary of the Superior Craton, SD: What is their potential for Ni-Cu-PGE mineralization?”, and participated in field trips to the Lac Des Iles palladium mine and the Midcontinent Rift near Thunder Bay. Locally, I led the “Gold Deposits of the Black Hills” field trip for the AIPG national meeting in September, and co-led with Alvis Lisenbee on a trip to the Bear Lodge Rare Element Resources project and Devils Tower for the same meeting.

I spent 5 weeks teaching field camp with Alvis Lisenbee and Nuri Uzunlar in Turkey in the summer. The Society of Economic Geologists student chapter continues to be very active in the department with about 30 members involved in monthly meetings and field trips – the latter included visits to the REE prospects in the Bear Lodge (WY), the Wharf gold mine, and the Deadwood Standard gold project on the Spearfish Canyon rim above Savoy.

SEG field trip on the Great Unconformity, Lead

From the Museum - Sally Shelton

In 2012, with the help of students, staff, faculty, volunteers, Facilities staff and professional movers, we completed a major milestone: clearing the Museum of Geology collections out of the Old Gym and moving them into the Paleontology Research Laboratory. The Old Gym basement, for the first time in over 30 years, was empty and had an echo. We are deeply grateful to everyone who contributed time and assistance to this difficult project. We are now in the process of sorting out thousands of specimens, records and historic items, and are planning for storage upgrades in the PRL. The Old Gym main floor and office areas have been upgraded for the use of the SDSMT music program; the basement is closed for now.

One of the principal treasures from the move is the J. P. Gries Collection of cores and cuttings from throughout his career. These have been stored in a nearly inaccessible room in the Old Gym basement for years. Jim Fox, Larry Stetler and Michelle Ozarowski have begun the working of linking the samples with well logs, records and maps. That project was helped immensely by the move of Dr. Gries's files from MI to the PRL archives. Jim Fox has taken the lead on getting all the components of the Gries collection in order. We anticipate that this will be a major reference resource.

Two summer interns contributed major amounts of time and expertise to two projects. Randall Weiss, who is working on a museum certificate at Black Hills State University (when he is not working at Wind Cave National Park), has scanned hundreds of historic photographs from the Museum's files. Arnold Melton, a student at Oglala Lakota College, spent the summer organizing and cataloguing the Museum's collection of field notes from many years of collecting trips and expeditions.

Collections volunteer Gene Hess is working on getting the Museum specimen collections data into the Specify database system for ease of both use and report generation. The Bump-Macdonald Library collection will be catalogued with the help of the Devereaux Library staff so that the book and reprint collections are inventoried, trackable and usable.

Major storage upgrades will be necessary for the mineralogy, map, and receiving room collections, as well as for the Gries collection. Now that the move is over, we have a good idea of exactly how large our collections are, and of what we need to do to house them adequately. We have received quotes for compact shelving systems and are exploring funding options. We are currently planning 3 reference rooms: the Bump-Macdonald Library (books, journals in heavy use, reprints and computer resources); the Doyle Archives Room (maps, locality files, field notes and GIS computers); and the Museum Archives Room (photographs, correspondence files and other archives, and journals in light use).

Sally Shelton spent a good part of the summer returning old loans, a project that is ongoing. Some old loans from SDSMT have been returned as well, including specimens from the Java Site in South Dakota, loaned out nearly 40 years ago. We continue to look through collections and records to make sure that all specimens are here appropriately.

Fume hoods were purchased for the geochemistry/microfossil lab and the analytical lab at the PRL. This will enable us to add much-needed capabilities and functions to the PRL and to the paleontology research program.

One highlight of the summer was a new and highly successful field camp at Agate Fossil Beds National Monument in Nebraska, our first field camp based around paleontology resource management rather than collecting. This was co-led by Dr. Robert Hunt, emeritus professor at the University of Nebraska-Lincoln and the leading authority on the Agate site; Dr. Darrin Pagnac; and Sally Shelton. The park superintendent arranged

on-site housing for the leaders and students, and Pat Monaco of Dinosaur Depot in Canon City, Colorado, provided food as well as instruction in microfossil techniques.

The other summer highlight was the addition of science teacher Jennifer Fowler as a one-month appointment as a preparator and family program leader, thanks to funding from the Foster Fund. Ms. Fowler, a dynamic middle-school science teacher, led a family paleontology field camp to the Kenny Brown Ranch, where participants found well-preserved mosasaur tail vertebrae. There were later jacketed and removed by members of the Paleo Club. Ms. Fowler provided in-depth information for future paleontology and geology education programs at the Museum, as well as recommendations for the Museum's planned programs in the Paleontology Tent at the Journey Museum.

Sally Shelton and Dr. Darrin Pagnac received a National Parks Impact Grant to initiate an environmental monitoring program for the Quarry Building at Dinosaur National Monument, which in turn is providing material for at least one student thesis. Ms. Shelton is also planning a fossil conservation project for the paper-shale fossils at Florissant Fossil Beds National Monument, which should also result in a student research opportunity.

Students in the Paleo Club contributed time and expertise to National Fossil Day public education programs at the Journey, and will be doing a series of After-School Science programs there on Wednesdays. Museum class students provided plans for upgrades to the geology wall at the Journey, and helped prepare the Hermosa dinosaur track slab for installation in the Journey lobby. Museum staff prepared a lobby exhibit for the new Kansas City Street campus building, focusing on the geology and paleontology of the region.

We benefited from the work of many volunteers over the past year. Special thanks are due as always to long-time volunteer and SDSMT alumnus Bill Schurmann, who continues to put in 30 hours per week, for a total of nearly 2000 hours for the year. We also thank the Dinosaur Depot in Canon City, Colorado, whose staff and volunteers put in hundreds of hours in preparation of part of our backlog of jacketed fossils. Museum technician Mike Ryan, who comes to us through Experience Works, completed his first year with us and has put in over 1000 hours in preparation, organization, and carpentry. We continue to work with the US Army Corps of Engineers, the US Forest Service, the Bureau of Land Management, the Bureau of Reclamation, and the National Park Service, and are now working with the Pine Ridge Reservation Tribal Historic Preservation Office, the Cheyenne River Reservation THPO and Cultural Resource Offices, and Oglala Lakota College on collections and resource management issues.

The Museum said good-bye to long-time workers David Foster, Michelle Pinsdorf and Heidi Minkler Carr, as well as volunteer Tom Loomis, and welcomed new assistant professor Dr. Christina Belanger and new Haslem Post-Doctoral Fellow Dr. Clint Boyd. Ms. Pinsdorf was hired as a fossil preparator at the National Museum of Natural History, Smithsonian Institution, and Ms. Carr is joining husband Jason Carr in Berkeley. A search for Ms. Carr's replacement is under way. With the addition of Drs. Belanger and Boyd, office space in the PRL is at full capacity. Dr. Maribeth Price joined us as curator of the map collection. We grieve the loss of volunteer and friend Tim Straub, who passed away on an archaeological project in Spain, and assisted greatly with the work on the mineralogy collection.

We received another donation of minerals from Dr. Clark Scovel and Dr. Steve Neely, and began assessing the storage and research needs of the mineralogy collection in depth. We thank Tom Loomis for his contributions to the organization and move of this collection for the past 4 years. With the help of the Museum Advisory Board, we will be looking at plans for the future of this enormous collection.

Sally Shelton is leading the host committee for June's double meeting: the 10th Conference on Fossil Resources, and the 28th annual meeting of the Society for the Preservation of Natural History Collections. This

meeting will include day-long sessions on mitigation paleontology, natural history repositories, and the iDig Bio collections digitization initiative sponsored by the National Science Foundation. Federal tribal and state collections issues will be highlighted, and the PRL will be the focus of the repository session. For more information, please contact Sally at Sally.Shelton@sdsmt.edu<mailto:Sally.Shelton@sdsmt.edu>, or join the SPNHC 2013 and 10th CFR<https://www.facebook.com/groups/SPNHC2013CFR10/> Facebook group.

The double meeting of SPNHC and the Conference on Fossil Resources is scheduled for June 17-22 in Rapid City, South Dakota. Both meetings are hosted by the Museum of Geology, South Dakota School of Mines and Technology, in conjunction with the local committee.

The Conference on Fossil Resources is a biannual initiative of Federal and non-Federal agencies and institutions working to preserve fossil resources in the public trust. The leading agencies are the National Park Service, the Bureau of Land Management, and the U. S. Forest Service.

The week will begin with a pre-conference field trip to the White River Badlands of South Dakota and Nebraska on June 15-16. Registration for this will include transportation, lodging, meals and a guide to the historic, biological, geological and paleontological features of this astonishing region. Principal sites include Badlands National Park, Pine Ridge Lakota Reservation, Agate Fossil Beds National Monument, and Toadstool Geologic Park, with other stops along the way.

The Conference on Fossil Resources will feature poster and platform presentations on June 17-18. The plenary address will be given by Vincent L. Santucci of the National Park Service, and will focus on the history of South Dakota's former Fossil Cycad National Monument and the lessons it provides for management of fossil sites and resources.

On June 19, the CFR and SPNHC will co-sponsor a joint workshop on repositories for natural history collections in the public trust. This will include discussions of the role of partnerships in managing collections, defining the legal responsibilities and policies of repositories, the issues with collections from Native American lands, repository fee structures, and related concerns. SPNHC will conclude the week with meetings, papers and posters on June 20-22, including the annual banquet, business meeting and committee meetings. A variety of smaller workshops and field trips are planned for June 22.

Rapid City is the home of South Dakota School of Mines and Technology, founded in 1885. It is close to a wide range of historic and natural attractions, colleges and museums. Rapid City Airport connects directly to Denver, Salt Lake City and Minneapolis.

For more information, contact Sally.Shelton@sdsmt.edu.

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The Museum of Geology Advisory Board met twice in 2012 to review the museum's programs and plans. Board members are:

Sue Ann Bilbey, Uinta Associates, Vernal, UT
Brent Breithaupt, Wyoming Bureau of Land Management, Cheyenne, WY

Michael Catches Enemy, CE Consulting, Pine Ridge, SD
Mark Fahrenbach, South Dakota Geological Survey, Rapid City
Charlene Foster, Pierre, SD
Jennifer Fowler, Rapid City School District
Jhon Goes in Center, Tribal Historic Preservation Office, Pine Ridge Reservation
Eric Grimm, Illinois State Museum, Springfield, IL
Mary Kopco, Historic Deadwood Foundation
Beverly Lingle, consultant, Idaho
Roger Portell, University of Florida, Gainesville
Michelle Thomson, Rapid City Convention and Visitors Bureau

The board reviewed the two surveys of the Museum of Geology conducted over the summer: the Museum Assessment Program in Collections Stewardship, conducted by Rebecca Buck of the Newark Museum, and the Conservation Assessment Program review of collections and historic structure concerns, conducted by Jude Southward of the Denver Museum of Nature and Science and Lesley Gilmore of CTA Architects in Billings, Montana. These surveys and reports are part of the Museum of Geology's drive toward full accreditation by the American Alliance of Museums.

From the Field Station:

Nuri Uzunlar, Director

I spent most of my summer flying from one camp to another. After spending part of the summer in June and July in Turkey with Alvis and Colin teaching field camp, in early August I went to Iceland to set up and teach the camp there. In the fall I spent some time in Turkey with Alvis chasing new projects and went Hawaii with Tim Masterlark to scout a new camp at Kilauea National Park on the big Island. Thanks to faculty members here at SDSM&T and your support, the Field Station now is the premiere field school in the nation and offers camps in the **Black Hills, Hawaii**, **Turkey, Iceland, India** and **Nepal**.

Courses offered in the summer of 2013 are listed in the table below.

Field Camps 2013			
USA			
Course No / Session No	Credit	Course Name	Date
GEOL 410 (Ranch A – S1)	6	Field Geology	May 13 - June 14
GEOL 410 (Ranch A - S2)	6	Field Geology	June 17 - July 19
GEOL 410 (Ranch A – S3)	3	Field Geology	July 22 - August 9
GEOL 410 (Ranch A – S4)	3	Field Geology	August 12 - August 30
GEOE 410 (Campus)	6	Engineering Field Geology	May 13 – June 14
GEOL/GEOE 412/512 Environmental Eng.	3	Science and Engineering Field Applications	May 20 – June 7
GEOL 471	2	Undergraduate Field Paleo.	Multiple dates -
PALE 571	2	Graduate Field Paleo.	Multiple dates -
Hawaii			
GEOL 412/512 Volcanology Field Camp	3	Science and Engineering Field Applications	July 30- August17
Turkey			
GEOL 410 Field Geology	6	Field Geology	June 3 – July 6
Nepal			
GEOL/GEOE 412/512 Geomorphology Camp	3	Science and Engineering Field Applications	May 20 – June 7
India			
GEOL/GEOE 412/512 Environmental Geology	3	Science and Engineering Field Applications	June 11-29
Iceland			
GEOL/GEOE 412/512 Volcanology Field Camp	3	Science and Engineering Field Applications	July 28 – August 16

In addition to traveling from camp to camp I have been very active in departmental committees and the department's graduate and undergraduate recruiting efforts. I attended GSA in Charlotte, North Caroline and to AGU in San Francisco to host a booth on behalf of the BHNSFS and the department. I also attended for research related presentations and energy related discussions. Once again I was honored with the John C. Mickelson Professorship Award in 2012.

The dream of building a field station somewhere in the Black Hills is still at large. I am looking for a suitable land somewhere close to Nemo, Spearfish or Rochford. Please contact me if you can help or you know someone who can. Ranch A is a great place as many of you know but with many summer courses and year around activities we need a field station that belongs to us.

For additional information about upcoming field station activities please visit: http://geologyfieldcamp.sdsmt.edu, call me at (605) 394–2494 or write to nuri.uzunlar@sdsmt.edu

Alvis and Colin enjoying the geology and culture of Turkey.