SOUTH DAKOTA SCHOOL OF MINES & TECHNOLOGY

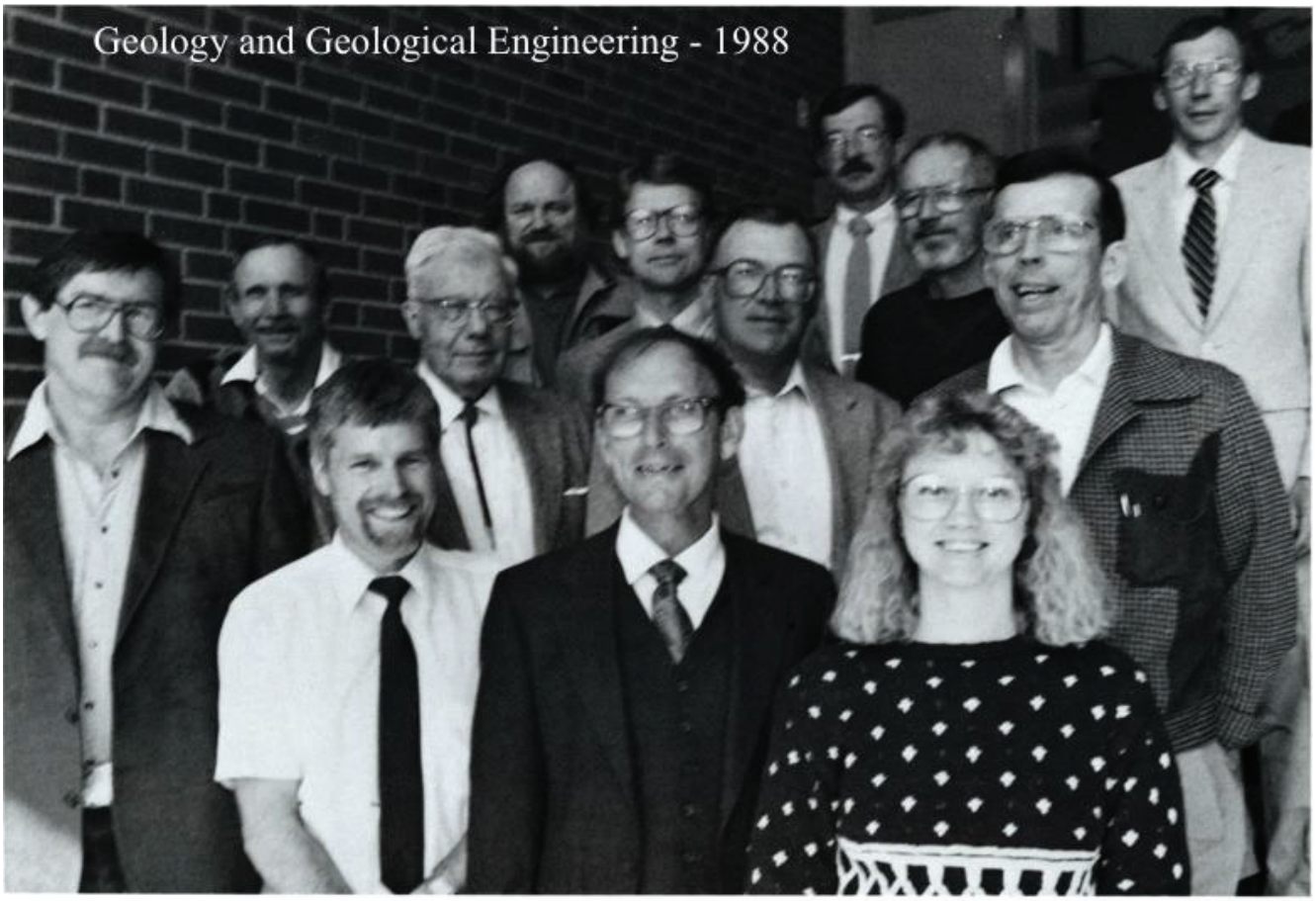
2013 Alumni Newsletter

Department of Geology and Geological Engineering

Department of Geology and Geological Engineering – Fall 2013: Left to right: (back row) – Laurie Anderson (Head), Tim Masterlark, Darrin Pagnac, Chris Pellowski, Nuri Uzunlar, Arden Davis; (front row) - Larry Stetler, Foster Sawyer, Maribeth Price, Kurt Katzenstein, Colin Paterson. Absent: Alvis Lisenbee, Perry Rahn, Sally Shelton, Zeynep Oner, Christina Belanger, Clint Boyd, Bill Roggenthen, Jim Fox and Jack Redden.

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 2014. The 2013 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!



Front Row (L-R): Dr. James E. Martin, Dr. Colin J. Paterson, Dr. Alvis L. Lisenbee, Marilyn Lundquit (Secretary). Second Row (L-R): Dr. Jack A. Redden, Dr. J.P. Gries, Dr. Perry H. Rahn, Mr. Fred V. Steece. Back Row (L-R): Dr. James J. Papike, Dr. James E. Fox (Interim Head), Dr. H. Ilkin Bilgesu, Mr. Merton C. Bowman, Dr. Arden D. Davis.

From the Head – Laurie Anderson

Status of the Department

The Department of Geology and Geological Engineering has had another great year! Undergraduate enrollments have increased dramatically in the last five years, particularly in GEOE (see table below). In our graduate programs, although enrollments have declined from a high of 56 in Fall 2011, we are seeing more students successfully finishing their degrees in 2012-13 (15 GGE MS and 2 PALEO MS). For comparison, undergraduate enrollments increased 3.3%, while graduate enrollments decreased 3% nationwide in the geosciences (AGI, 1 Feb 2013).

Enrollments	Fall 08	Fall 09	Fall 10	Fall 11	Fall 12	Fall 13	1 year % change	5 year % change
B.S. GEOE	43	39	50	60	67	91	+36%	+112%
B.S. GEOL	57	52	76	78	79	83	+5%	+46%
M.S./Ph.D.	42	45	53	56	49	46	-6.1%	+9.5%

We received a final statement of accreditation from ABET in August 2013. Previously cited weaknesses have been resolved to the greatest extent possible within the response time window with issues for criterion 2 (program educational objectives) resolved, and a weakness for criterion 5 (curriculum) modified a concern pending transcript analyses of individual students at the next review. The GEOL BS is currently conducting a program review, and our graduate programs will be reviewed next year.

Career placement of our undergraduates is very positive. In 2011-12 GEOEs had 100% and GEOLs had 80% placement. The average starting salary for GEOE graduates was the highest on campus ($73,333) with the salary for GEOL graduates ($63,193) also above the average for SDSM&T ($62,696). This fall we had 22 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. The department also participates in the Rocky Mountain Rendezvous, a regional student career expo for the energy sector (sponsored by AAPG and SEG), and our students are again being hired by major oil companies. We still have much to do to increase the visibility of our excellent programs and students with industry at a national and international level. We welcome any assistance that alumni and industry partners can provide in promoting SDSM&T, GGE, and our students!

We are revising and expanding our curricular offerings. We have added graduate courses in Geodynamics and in Linear Inverse Methods in Geology. We will be launching accelerated MS tracks for both the GGE and PALE degree programs in Fall 2014. These programs will allow our juniors to apply for admission to the graduate program so that they can use up to nine (9) credits of graduate-level course work in their senior year to both their BS and MS programs. We also have completely revamped the PALE MS program. The new curriculum will be launched in Fall 2014 and while maintaining our field and museum based focus, we are expanding offerings in quantitative and analytical methods with the addition of courses in Paleobiology, Paleoenvironments, Quantitative Paleontology, Terrestrial Paleoecology, and Phylogenetic Systematics.

The Department is leading efforts on campus to establish interdisciplinary research and teaching efforts in energy resources through the Energy Research Initiative (ERI). President Wilson and the SDSM&T Foundation have made this initiative a top priority for fundraising. We seek to develop a nationally prominent program of basic and applied research and education that covers both upstream and downstream components of the energy sector. We will foster interdisciplinary education and research opportunities for both undergraduate and graduate students, whether those students are interested in pursuing upstream or downstream careers, or careers in engineering or science. Our goal is to offer industry-relevant courses tailored to the professional goals and research/design interests of a variety of students. We are currently drafting an undergraduate minor in petroleum systems (18 credits) and a graduate certificate program in petroleum systems (12 credits), the latter of which both SDSM&T graduate students and outside professionals could enroll in. To support this educational effort, the Black Hills Natural Science Field Station also is establishing a petroleum field camp.

Although much of the expertise to make ERI a successful venue for research collaboration and student training is already in place at SDSM&T, a few key components must be added to ensure its success. These include a senior-level faculty member with expertise in fracing, petrophysics or geomechanics and whose research program is recognized by industry as critical to resource plays in addition to funds that will allow us to build and support a state-of-the-art fracing/petrophysics/geomechanics lab, undergraduate scholarships and graduate student stipends.

Our research efforts also have been met with much success. For the department as a whole, grant awards increased 581% between fiscal years 2010 and 2013, and the first four months of 2014 are already higher than the fiscal year 2013 total. When the department and museum are considered together (museum faculty grants can be administered through either unit), the three-year change is +275%.

Fiscal Year (July-June)	Awards GGE Dept.	Awards Museum	Awards Total
14 (through Oct.)	$626,270	$173,028	$799,298
13	$592,964	$25,000	$617,964
12	$170,870	$33,200	$204,070
11	$133,065	$55,500	$188,565
10	$87,090	$77,699	$164,789

We welcomed Zeynep Oner as an assistant professor in basin analysis and tectonics this fall. Zeynep completed her PhD at Miami University (Oxford, OH) and a postdoctoral appointment at the University of Alabama before joining us in August. Zeynep's research interests include the formation, uplift and exhumation of metamorphic core complexes and the tectonic evolution of extensional terrains. Zeynep also is coordinating efforts to establish an AAPG student chapter on campus.

We currently have two faculty searches underway including a position in petrology that Dr. Tim Masterlark is chairing and in 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. The guidance that these bodies are providing is of great help as we build and expand our research and education programs. The Fall 2013 advisory board meeting was postponed by Winter Storm Atlas. We convened a conference call in December to discuss strategic plan implementation and will get together face-to-face again in April, provided the weather cooperates! We are always accepting nominations for membership on our advisory board.

I'd like to acknowledge some of the gifts we received in 2013 (apologies for any omissions). Randy Taylor (Taylor Drilling Company) donated time and equipment to improve the MI well field. Whiting Petroleum provided $40,000 in student support. Barr Engineering has been a long-time supporter of our programs and again generously provided unrestricted funds in support of students. Additional gifts from alumni and faculty include those from Hilary Brook, Thomas Wilker, David Kyllonen, Kenneth Story, Maribeth Price, and Nuri Uzunlar.

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!

Department Scholarships and Fellowships:

Sherwin J. Artus	• Victoria Bierworth (BS GEOE) • William Eldridge (BS GEOE) • Zachary Lampert (BS GEOE) • David LaPorte (BS GEOE)
Macy Baresch	• Michael Leopold (BS GEOE)
Jeff L. Bauer Memorial	• Joshua Barth (BS GEOL) • Alyssa Biel (BS GEOL)
Lynn and Nancy Owen Bell	• Tait Earney (BS GEOL)
Bittner-Campbell Memorial	• Andrew Warren (BS GEOE)
Joseph P. Connolly	• Joshua Laird (BS GEOL)
Homer Davis Memorial	• Jordan Richey (BS GEOE)
Gregory French	• Ethan Melville (MS GEOL)
Paul and Virginia Gries	• Paul Barrett (MS PALE) • Jennifer Bednar (PhD GEOE) • Laura Clarke (MS PALEO) • Jarod Fox (BS GEOL) • Christina Gardner (MS PALE) • Kasey Garrand (MS GEOL) • Kyle Hazelwood (MS GEOL)

	• Zakary Jewell (BS GEOL) • Michael Leopold (BS GEOE) • Christina Rebholz (MS GEOL) • Fleford Redoloza (BS GEOE) • Mariah Slovacek (MS PALE) • Josiah Windish (BS GEOL) • Ben Zalneraitis (MS PALE)
Paul and Virginia Gries (for field camp)	• Aaron Frederick (BS GEOE) • Dakota Isaacs (BS GEOL) • Jonathon Meyers (BS GEOL) • Grace Sumption (BS GEOL)
James O. Harder Memorial	• Bryce Kampa (BS GEOE)
Ben Holmes Memorial	• Ethan Courter (BS GEOE)
Joseph and Josephine Kulik (for field camp)	• Joshua Barth (BS GEOL) • Kimberly Berry (BS GEOL) • Joshua Laird (BS GEOL)
Dr. Ray Lemley Memorial (for field camp)	• Conner Brightwell (BS GEOL)
McGillycuddy Departmental Service Award	• Evan Doughty (BS GEOL) • Katherine O'Rourke (MS GEOL)
John C. Mickelson	• Michael Calvello (PhD GEOL)
Jack A. Redden (outstanding geology senior)	• Clinton Koch (BS GEOL)
Bill & Jean Roberts	• Shelby Allen (BS GEOE) • Amy Freye (MS GEOL)
Bill & Jean Roberts (from Western Gem & Mineral Society)	• Tyler Rust (BS GEOL)
Roy E. Roadifer	• Garson Bowers (BS GEOL) • Clayton Embrey (BS GEOL) • Elizabeth Montemayor (BS GEOL) • Trevor Mount (BS GEOL) • Kayleigh Muilenburg (BS GEOL) • K. Nishanthi Perera (BS GEOE) • Chase Roskos (BS GEOL) • Samuel Scherrer (BS GEOL) • Colton Selberg (BS GEOE) • Taylor Selberg (BS GEOE)
Leslie & Valeta Roggenthen	• Andrew Warren (BS GEOE)
Seth Schaefer	• Evan Doughty (BS GEOL) • Jonathan Emmer (BS GEOE)
John Scully Foundation	• Lee Dobson (BS GEOE) • Tait Earney (BS GEOL) • Josh Laird (BS GEOL)

	• Tyler Rust (BS GEOL) • Grant Vaucher (BS GEOL)
Jane Speice Memorial	• Christopher Schiller (BS GEOL)
Edward L. Tullis (outstanding geological engineering senior)	• Drew Felton (BS GEOE) • Melissa Heron (BS GEOE)
Whiting Petroleum Corp. Graduate Fellowships	• Amy Freye (MS GEOL) • Kasey Garrand (MS GEOL) • Ethan Melville (MS GEOL) • Ivana Stevanovic (PhD GEOL)
Whiting Petroleum Corp. Travel Awards	• Jennifer Bednar (PhD GEOE): AIPG - Broomfield, CO • Laura Clarke (MS PALE): North American Paleo Convention - Gainesville, FL • Michael Baranowski (MS GEOL): Schlumberger Petrel Training – Bakersfield, CA and Denver, CO • Micheal Tekle (MS GEOE): Schlumberger Petrel Training - Houston, TX • J Max Cange, Evan Doughty, Heather Falkner, Kasey Garrand, Keyo Halbmaier, Darrah Jorgensen, Kaitlynn Langenbau, David Lee, Ethan Melville, Kathryn O'Rourke, Grace Sumption, and Paul Woods: GSA Meeting – Denver, CO

SDSM&T Scholarships and Fellowships:

Joseph F. Nelson Graduate Fellowship	• Katherine O'Rourke (MS GEOL)
William A. Griffith Award	• Michael Calvello (PhD GEOL)

External Scholarships and Fellowships:

American Federation of Mineralogical Societies	• Amber Johnson-Carroll (MS PALE)
Evolving Earth Foundation Student Grant	• Bethany Costello (PhD GEOL)
National Science Foundation Graduate Research Fellowship	• Lily Jones (MS GEOL)
Society of Economic Geologists	• Tait Earney (BS GEOL)

Senior Research Projects:

Joshua Barth (BS GEOL)	Dating rock fall Events in Botany Canyon using Lichenometry
Eric Beebe (BS GEOL)	The use of Benthic Foraminifera as low oxygen

	indicators through body size
Aidan Brady (BS GEOL)	Understanding overall Brachiopod diversity at changing icehouse and greenhouse conditions
Conner Brightwell (BS GEOL)	Mammal diversity and body size trends in the North American grasslands from the Miocene to the Quaternary
Evan Doughty (BS GEOL)	Modeling of Bison skeletal material entrainability during the 2011 flood of the Missouri River, SD
Dakota Isaacs (BS GEOL)	Determination of geospatial correlation of extensional faults with Poseidon Temples through the use of Geographic Information Systems
Hans Krage (BS GEOL)	Evaluation groundwater susceptibility and vulnerability methods in the Black Hills
Joshua Laird (BS GEOL)	Comparative analysis of Tepee Butte carbonate caps near Newell, SD
James Stearns (BS GEOL)	Identification and implications of a Rhinoceros skull from Eocene-Oligocene South Dakota
Grace Sumption (BS GEOL)	Modeling magma chamber deformation at active plate boundaries in the southeastern portion of Iceland along the Mid-Atlantic Ridge

Finally, all of the best to you for the New Year. I hope you will think of us as part of your charitable giving plan now and in future years. I would be happy to chat with you about the department's needs and goals at any time.

Anderson Teaching/Research/Service news:

I have ramped back up on my research this year. As I'm writing this I am on a boat on the Arapiuns River in Brazil on an aquatic faunal survey for the Lower Amazon region. I'm collecting freshwater mollusks while others on the team will be studying the fish, crustaceans, sponges, annelids, and flatworms of the regional waters that include the classic black, white, and clear water rivers of the Amazon Basin. The project is funded by the National Science Foundation's Aquatic Surveys and Inventories program. The project director is Will Crampton from the University of Central Florida and the international team includes representatives from Brazil, Argentina, Spain and the US. I had one paper related to this work published in Zoologica Scripta this year and a book chapter is in press with publication scheduled in early 2014.

I also received funding with Annette Engel from the University of Tennessee - Knoxville and Barbara Campbell from Clemson University for a field and lab investigation of the genetic, taxonomic, and functional diversity of modern lucinid bivalve chemosymbiosis from coastal marine biomes. Funding for the project is through the NSF Dimensions of Biodiversity program. Chemosymbiosis, the association of bacteria that fix carbon in the absence of sunlight and supply it to their hosts, remains largely unexplored in shallow marine, coastal

environments. Lucinids are the most taxonomically diverse clade of bivalve clams that exploit chemosymbionts to gain energy and avoid toxins.

2 Confluence of the Amazon (white water = sediment laden) and Tapajos (clear water) Rivers.

1 Phacoides pectinatus collected from mangrove sediments June 2013.

We will also test for ways to characterize lucinid-bacteria biodiversity in the geologic past. Because lucinids have an extensive fossil record, geologic time is a "4th dimension" of biodiversity that can reveal more about the evolutionary history of lucinid chemosymbiosis. My part of the project is to investigate how the morphology of the living bivalve hosts might reveal the presence of endosymbionts, degree of symbiotic dependence, or the type of symbiotic dependence. If we find a link it gives us a way to track this relationship in the fossil record. Fossils of this bivalve family are common in the Cretaceous rocks of West River, and are especially associated with fossil hydrocarbon seeps that dot the landscape out on the prairies. I have one book chapter in press that is related to the project, which is due for publication in early 2014.

My work still continues on the effects that the 2010 BP oil spill had on coastal ecosystems in the GOM with one paper accepted to Marine Pollution Bulletin this year.

I was also able to get in the field over the summer with a collecting trip to the Gulf Coast in June and in August, and a chance to do some field work in Wyoming in June with Joseph Hartman (University of North Dakota) and Art Bogan (NC Museum of Natural Sciences).

Some of us in the museum (Christina Belanger, Darrin Pagnac, Maribeth Price, Sally Shelton, Gene Hess and I) also were awarded funding for museum collections work focusing on collections of the Cretaceous Western Interior Seaway (WIS) from the Institute of Museum and Library Services. This grant will provide the opportunity to fully integrate and digitize the vertebrate, invertebrate and micropaleontological collections (as well as associated archives) associated with the WIS. We will be developing a virtual field trip and a WIS exhibit as part of the project, so keep an eye out for those resources on the Museum's webpage in the next year or so.

All the best,

Laurie C. Anderson
Head and Professor, Geology & Geological Engineering
Director, Museum of Geology
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605-394-1212 (museum office)

OTHER EVENTS AND NEWS IN 2013

Whiting Petroleum Corporation gift:

Whiting Petroleum Corporation has donated $40,000 to support students in the Department of Geology and Geological Engineering at the South Dakota School of Mines and Technology. These funds will be used to support the two initiatives of graduate enhancements and geoscience student enrichment.

Graduate enhancements will support competitive graduate stipends that can be offered to attract qualified students interested in energy sector careers and geoscience student enrichment will support student research and training opportunities that may include undergraduate and graduate student travel for field trips, professional meetings and professional workshops.

L to R: **Rick Ross** (BS ME 1981), vice president of operations, Whiting Petroleum; Dr. Laurie Anderson, Department Head of Geology and Geological Engineering at SDSM&T; **Sherwin Artus** (BS GEOLE 1960, MS MIN E 1962), Whiting Petroleum director and former CEO; and **Ron Jeitz** (BS CE 1969), SDSM&T Foundation development officer.

Department news:

February:
Museum of Geology loans a treasure of prehistoric proportions in Legacy News, page 5.
http://www.sdsmt.edu/uploadedFiles/Content/Campus_Services/University_Relations_and_Media/Publications/LegacyNews_Feb.pdf
March:

Mines research unearths new dinosaur species in Legacy News, page 2.
http://www.sdsmt.edu/uploadedFiles/Content/Campus_Services/University_Relations_and_Media/Publications/LegacyNews_Mar.pdf
May:
Paleontology Research Laboratory hosts Passport in Time in Legacy News, page 4.
http://www.sdsmt.edu/uploadedFiles/Content/Campus_Services/University_Relations_and_Media/Publications/LegacyNews_May.pdf
June:
2013 J.P. Gries Geologist of the Year award announced in Legacy News, page 7.
http://www.sdsmt.edu/uploadedFiles/Content/Campus_Services/University_Relations_and_Media/Publications/LegacyNews-June.pdf
Dr. Christina Belanger aboard the Joides Resolution research ship.
http://joidesresolution.org/node/3103
Dr. Clint Boyd interviewed by SD Public Radio: Fossil Preparation Tells Story of Ancient Violence.
http://listen.sdpb.org/post/fossil-preparation-tells-story-ancient-violence
July:
New exhibit details Nimravids history in South Dakota in Legacy News, page 7.

http://www.sdsmt.edu/uploadedFiles/Content/Campus_Services/University_Relations_and_Media/Publications/LegacyNews-July.pdf
Whiting Petroleum Corp. gives $40,000 to Mines
http://www.sdsmt.edu/News/Whiting-Petroleum-Corp--gives-$40,000-to-Mines/
August:
Dr. Darrin Pagnac is interviewed by the Capitol Journal: Welcome to Jurassic Cretaceous Oligocene Park
http://www.capjournal.com/news/welcome-to-jurassic-cretaceous-oligocene-park/article_b033e1b6-1133-11e3-8cd0-0019bb2963f4.html
Millennia-old Triceratops arrives in Legacy News, page 3.
http://www.sdsmt.edu/uploadedFiles/Content/Campus_Services/University_Relations_and_Media/Publications/LegacyNews_August.pdf
October:
Bring your backyard finds to Fossil Day in Legacy News, page 8.
Geologists erect Black Hills interpretive sign in Legacy News, page 9.
Museum of Geology lands $300K grant to digitize paleo collection in Legacy News, page 10.
http://www.sdsmt.edu/uploadedFiles/Content/Campus_Services/University_Relations_and_Media/Publications/LegacyNews_October.pdf
November:
New Research suggests modern grasses are 15 million years old in Legacy News, page 6.
Mines joint research on threatened biodiversity lands $1.63 million award in Legacy News, page 7.
http://www.sdsmt.edu/uploadedFiles/Content/Campus_Services/University_Relations_and_Media/Publications/LegacyNews_Nov.pdf

Christopher Pellowski

As the new department coordinator and Ranch A field camp instructor, I devote 60% of my time to assist the department with administrative duties and recruitment efforts and 40% to the Ranch A geology field camp. My departmental duties include preparation of graduate student applications for review by the faculty, developing new recruiting materials for interested students, serving on department committees and updating the department webpage. As a lead instructor at Ranch A, I am also responsible for the planning and daily logistics of each camp.

It was a busy year at Ranch A with two five-week and two three-week sessions being offered this past summer. During the first two five-week sessions, we had 25 students from 11 universities in session 1 and 25 students from 13 universities in session 2. During the two three-week sessions, we had 23 students from 17 universities in session 3 and 15 students and two lecturers from the University of Suriname in session 4.

Session 4 was offered to the M.Sc. students in the Mineral Geoscience program at the University of Suriname as a specialty course in their professional degree curriculum. Bill and Elieen Roggenthen assisted with the logistics of getting this group from Suriname to Ranch A as well as providing a familiar face and gracious hospitality during their stay.

Recruitment efforts for our department include visits to local high schools. On November 7th, counselors from Admissions invited our department to join them for a visit to Central High School and promote our programs. We packed up some mineral and fossil specimens to lay out as well as our new undergraduate degree brochures that we handed out to interested students.

The undergraduate students from the Tech Geological Association (TGA) that participated include, standing from left to right, Dakota Isaacs (BS GEOL), Tait Earney (BS GEOL) and Michael Day (BS GEOL). Photo by Kathy Haselhorst, Admissions Counselor.
On December 11th, we were again invited to visit Central High School and this time we brought along the new sediment flume to provide a hands-on activity to the interested students.

Kurt Katzenstein, to the left, is explaining the stream dynamics and erosion that occur during a flooding event. Photo by Ashley Ecklund, Admissions Counselor.

I currently serve on five department committees and assist with data gathering and synthesis for the GEOL program review that is currently being written and the upcoming ABET review as well as contribute my background knowledge of the department/university inner-workings to current issues that are being addressed.

On a personal note, the Hermosa 7.5' geologic quadrangle that I co-authored with Alvis Lisenbee has recently been published by the South Dakota Geological Survey and you may download a copy by clicking on the following URL. http://www.sdgs.usd.edu/pubs/pdf/GQ24K-17_20131114.pdf
In closing, be sure to visit and like us on Facebook.
https://www.facebook.com/SDSMTGeologyGeologicalEngineering

From Our Emeritus Professors:

Perry Rahn

Perry Rahn is still busy cutting down trees infected with the "Mountain Pine Beetle" and providing fire wood for the faculty and whoever else needs it. 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 fully retired and 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 build-out of the seismic detection and characterization system that is currently located on the 4100 leve

Alvis Lisenbee

Where has the year gone? It seems much less than twelve months ago that Nuri reminded me that it was time for a newsletter. It was, I am pleased to say, another enjoyable year. In the campus area Dr. Davis, Dr. Price and I, along with graduate and undergraduate students, continued working on characterizing ground water in the crystalline rocks of the central Black Hills. This involved knocking on doors with sample bottles in hand and asking 100 home owners to participate. There was an amazingly positive response to these requests. Among the things we've learned is that if you are thinking of your retirement home out that way, better have a look at the arsenic content of your well. There are broad areas with elevated levels of As, as well as iron and hard water and…….

Helping organize the 9th Annual Oil and Gas conference, scheduled for early October was an effort made more enjoyable by working with Steve O'Rourke who is now retired (sort of) in Rapid City with Donna, both alums from the 1980's. Our schedule was overtaken by one of nature's in the form of a massive blizzard which closed the conference, the campus, Rapid City and western South Dakota. Therefore, for those with petroleum interests in the northern Great Plains and Rocky Mountains, there is another chance to participate April 23rd to 26th during the rescheduled dates.

I am pleased to continue to travel to parts of the world with amazing geology, history and cultures. In May, this included a trip to South America with Nuri Uzunlar where we met Dan Kelly of Bowling Green State University in order to determine the feasibility of a volcano-related field course. Apparently, it is always spring on the Equator in Ecuador and the Galapagos Islands, and the weather treated us wonderfully well. Quito, the old Spanish capitol is surrounded by volcanos. A beautiful example is that of Cotopaxi.

We visited on a day trip, lead by a young French geologist who teaches at the University of San Francisco in Quito. His knowledge included local history and ethnography as well as geology. The Ecuadorian guide, also provided by the university, had knowledge and opinions on everything else, e.g., politics, the rain forest, the influx of wealthy Columbians……
We visited volcanoes on the Galapagos as well and there is actually a lot of basalt – at least for a structural geologist.

There was also time for seeing the turtles, iquanas and finches made famous by Darwin's visit here. The beaches revealed a wonderful mixture of sedimentation and volcanology.

The reconnaissance was a success, as was the first Black Hills Natural Sciences Field State Galapagos Field Camp taught by Dan this past summer.

I participated in the Turkish field camp once again – the experience is too good not to want to enjoy it. This was the tenth year. Colin Paterson, Nuri, Zeynep Oner, our new structural geologist, and I have a system now in which we know the details of each week well enough feel comfortable that the pace and difficulty challenge the students just enough. The course utilized the components of a Cretaceous suture zone to show a remarkable range of the ways of Earth's construction. For instance the accretionary complex within the Izmir-Ankara suture displays unrivaled examples of "knockers" in the serpentine-matrix mélange.

From the Faculty:

Arden Davis

During the past year I completed my second three-year term on the ABET Board of Directors. SME honored me recently by announcing that I'll be the recipient of the Ivan B. Rahn Education Award. (No relation to Perry H. Rahn, by the way.)

In 2013 I taught a new course in aqueous geochemistry, along with geological engineering courses in the areas of ground water and engineering design. My research continues to focus on ground-water protection, aquifer vulnerability, water quality, and removal of arsenic and heavy metals from drinking water. Dr. Alvis Lisenbee and Dr. Maribeth Price collaborated with me on research involving water quality in Precambrian rocks of the central Black Hills. In arsenic and heavy-metals research, I've continued to collaborate with Dr. David Dixon (Chemical Engineering), Dr. Cathleen Webb (Western Kentucky University), and Dr. Jenifer Sorensen (RESPEC).

During the summer, my wife and I spent part of the time at our farmstead in Minnesota. Last year we mainly concentrated on getting some work done on the exterior of the big farmhouse, along with painting of buildings and other upkeep. We had the wettest spring and summer I can remember – the

fields around us were too wet for planting crops, and we also decided to let the soil rest for a year in the garden.

A special note of appreciation is expressed to Randy Taylor (B.S. GEOE, 1988), President of Taylor Drilling Company. Randy donated a new stainless-steel Grundfos pump, associated pipes and fittings, and a brass gate valve, along with his time and expertise, in getting the main well back into operation at the MI well field. Hundreds of ground-water students have used the well field for aquifer tests over the years, and it's great to have the pump working again.

As always, it was enjoyable to hear from many alumni who visited recently. If you're in the area, please stop by.

Larry Stetler

Another busy year has been completed. In 2013 I taught 9 courses, saw 3 of my GeoE MS students successfully complete a thesis, and advanced 2 additional GeoE PhD students to candidacy. Additionally, 1 Geol BS undergraduate student completed a senior research project with me. I was chair of 2 faculty search committees and members of 2 others. Four manuscripts were published and 3 additional manuscripts have been accepted for publication. On a down note, my last funded research project ends at the end of 2013 after which I am unfunded. Anyone out there who want to assist in this area, please let me know!

During summer 2013, my 5-week engineering geology field camp had 42 students enrolled! I had the privilege of having 2 fulltime faculty, 2 part-time faculty, and a full time TA. We made it through to the end, which means everyone worked diligently. I also assisted as a faculty instructor of the 1st geological hazards field camp held at Hawaii Volcanoes National Park. Dr. Tim Masterlark of our department was lead instructor for this camp. This was a 3-week camp where we worked from sea level to almost 14,000 feet. One of the highlights was making a night trek across the basalt flows to an active lava flow ending into the Pacific Ocean (Fig. 1).

Figure 1. Active basalt flow into the Pacific Ocean on the eastern flank of Kilauea.

We also made it to the top of Mauna Kea at 13,796 feet AMSL. Figure 2 is the proof! From here, we can look to the southwest to the top of Mauna Loa, the largest volcano on Earth at 13,678 feet AMSL (Fig. 3). We completed a 3-day basalt flow mapping project at about 9,500 feet elevation on its northern slopes. This camp was great fun and great projects.

Figure 2. Here I am on top of the Hawaiian world ant nearly 14,000 feet. In the background, from left to right are the optical/IR UH2.2 m Telescope, the 8.1m optical/IR Gemini Telescope, and the 3.6m Canada-France-Hawaii Telescope.

In the spring, Dr's Katzenstein, Sawyer, and myself attended an ABET workshop in Portland, OR, where we began our current evaluation initiatives for the next site visit in Fall 2016. This will be an activity to occupy

much of my time between now and then. I attended 3 professional conferences in 2013 and presented 2 papers and several posters with students.

Figure 3. Southwest view from Mauna Kea back to Mauna Loa. The arrow indicates the approximate location of our basalt mapping project.

My kids still go to school in Hermosa, about 15 miles south of Rapid City. Morgan is 12 and in 6th grade. She was on the school volleyball team this past fall, is continuing her piano lessons, is enrolled in a modern dance class, and is active in her youth group activities at church. Briggs is in 1st grade, is currently in swim lessons and played baseball last summer. All of this translates into a lot of running and getting home as early as 6:30 PM is unusual. But, life is great and we are all having a blast!

Kurt Katzenstein

I hope this holiday season finds you and your family well. 2013 was another busy year for me as I continually balance time between fatherhood and my duties here at SDSM&T. First, on the personal front, our two daughters are now just about four and two and a half and are doing great. My wife and I are expecting our third daughter in early January so that will make for a busy Spring semester!

I taught my usual four courses this past year (GEOE 221 – Geology for Engineers, GEOE 324 Engineering Geophysics, GEOE/MEM 110 – Introduction to Geological and Mining Engineering, and GEOE 466/566

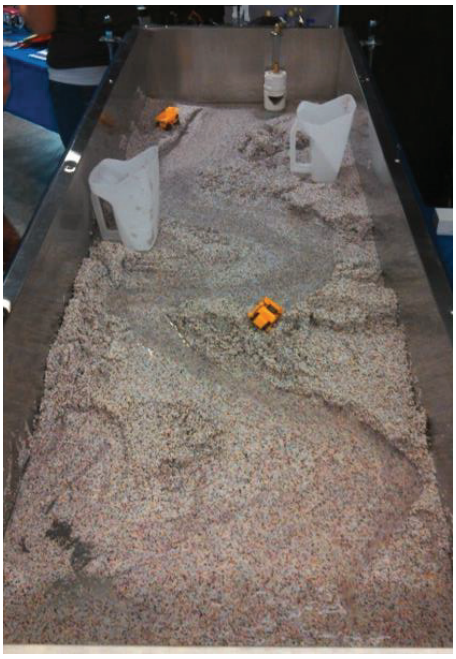
Environmental and Engineering Geology). Each course had the highest enrollments I have seen since coming here in 2008. In total I had about 190 students in four classes which made for many late nights keeping up with grading! My schedule was truncated further while recovering from my surgically repaired broken collarbone in February (apparently it is a bad idea to run head/shoulder first into a racquetball wall at full speed!).

I have continued to conduct InSAR research to quantify surface deformation resulting from natural and anthropogenic sources. One of my graduate students, Kathleen Grigg, graduated in August and finished her work detailing subsidence in Wyoming resulting from coalbed methane production. My work looking at

groundwater related subsidence in the vicinity of Cedar Valley, UT was recently published as a miscellaneous publication by the Utah Geological Survey (http://geology.utah.gov/online/mp/mp13-05.pdf). I also presented preliminary results from an InSAR study at the Indian Wells Valley in California which details ongoing groundwater-related subsidence in an arid portion of California at the Geological Society of America national meeting in Denver (I also organized a trip that allowed 15 students from our department to attend the GSA meeting. Thanks to Whiting Petroleum and Nuri at the BHNSFS for providing funds for that trip!). More recently I have submitted proposals to perform studies investigating surface deformation in Saskatchewan and Qatar (hopefully more details on these next year when they are funded). I am also working with RESPEC to design and build an apparatus that can perform direct shear tests on rock samples (this is in addition to the soil direct shear box and point load index apparatus I purchased in previous year). This will allow for future rock slope stability studies. We anticipate the piece of equipment will be finished in January.

Early this fall, I spent multiple evenings converting an old stainless steel sink from our department mail room into a sand flume that we can use for labs in Fluvial Processes and Stratigraphy and Sedimentology classes as well as during recruiting trips. The stream gradient is adjustable as is base level, flow rate, and sediment thickness/distribution. I painted it in SDSM&T colors and plan to either paint or attach SDSM&T labelling in the near future. We have already used it at two "Go to Mines" events, one lab and a local high school visit and it has been a big hit!

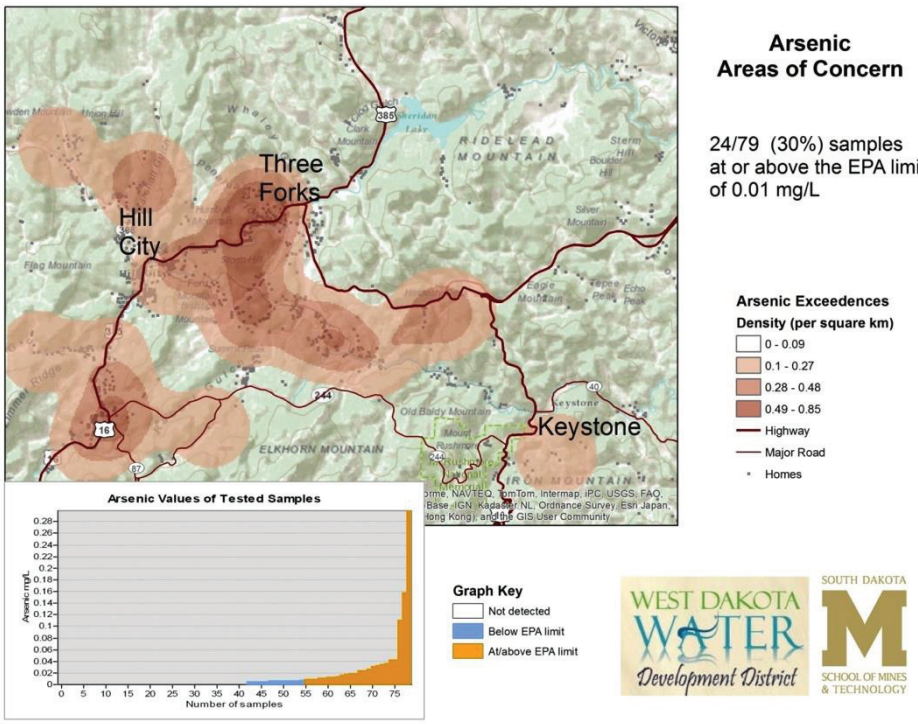
As usual, the Tech Geological Association had a productive year. We climbed Harney Peak, camped in Custer State Park, hosted the annual Fall Kickoff Party and Photo Contest, hosted the annual Ice Fishing Extravaganza at Sheridan Lake, had multiple bowling outings, went curling (a big hit!), went agate hunting, conducted outreach activities such as having booths at the Corral Drive Science Night, the Sturgis Brown High School Career Fair, and had students attend multiple high school recruiting events organized by the SDSM&T Admissions office. We currently have roughly 50 members, each of whom are student members of a professional organization of their choice (a requirement to be a member of TGA).



Maribeth Price

Greetings from the geospatial side. This past year's research has been focused on ground water quality in the PreCambrian Black Hills, with my colleagues Arden Davis and Emeritus faculty Alvis Lisenbee. The West Dakota Water Development Districts has provided funding to sample private wells and test for potential contaminents, including arsenic, iron, nitrate, sulfate, hardness, and bacteria. The Mt Rushmore and Hill City quadrangles comprise the study area. Graduate students Gary Smith, Erik Walega, and Henok Tiruneh, with undergraduates Hans Krage and Evan Doughty, have spent their fall Sundays canvassing housing developments in search of homeowners willing to have a free water test. Most of them were very receptive, and only a few turned us down. We have collected about 90 samples which are giving us a better picture of water quality in this region.

Arsenic and iron seem to pose the greatest hazard in this area. Thirty percent of the samples exceeded the EPA limit for arsenic, and 35% exceeded the limit for iron. The exceedences primarily occur near or within recognized mineralization zones. So far we have not found any specific geologic units or features, but work is ongoing. As per our agreements with the homeowners, we cannot show plots of the locations to the public, but we are developing a series of maps showing "Areas of Concern" by creating density maps of exceedences, where risks of water problems are elevated. The figure below shows the areas of concern for arsenic, with a graph of the arsenic values detected. Orange values in the graph are above the EPA limit, blue are below. No bar means the arsenic was below the detection limit.



Foster Sawyer

Another exciting year has flown by, and I hope this message finds you and your family in good health and spirits! The Department continues to grow and flourish, and as always the most satisfying aspect of this job is to observe the success and accomplishments of our students and to hear exciting news from alumni and friends of the Department.

We continue to develop our courses and resources related to energy fields, and to that end last spring semester I revived and retooled our Petroleum Geology course to reflect changes in the industry, to incorporate the Petrel software suite that has been generously donated to the department by Schlumberger,

Ltd., and to make the course available to both graduate and undergraduate students. We also have incorporated PIPESIM software into our Petroleum Production and Drilling Engineering course, and numerous students are utilizing Petrel and other software in their research projects. We also are making progress in acquiring digital data sets that can be used with our new software resources for teaching and research. Other exciting developments on the energy front are the interdisciplinary undergraduate minor in petroleum systems and the graduate certificate in petroleum systems that currently are under development at SDSM&T under the direction of Dr. Nuri Uzunlar. Of course, we continue to organize and host the New Horizons Oil & Gas Conference which will occur this year on April 23-26, 2014.

Teaching and advising are central to our work, and I was fortunate to have three students complete M.S. degrees in 2013 (Kelsey Marzolf, Jason Testin, and Matt Morton). I also am a faculty sponsor for the Tech Geological Association which has grown to over fifty extremely active members. In the upcoming year I also hope to spend more time with the Society of Petroleum Engineers (SPE) Student Chapter to increase our level of activity and visibility both on campus and within the Powder River Basin Section of SPE.

Grant programs with which I am involved are highly active with a full summer and school year of activities for our cooperative NSF STEM education program with Oglala Lakota College and South Dakota State University. I also was recently awarded a second year of funding from the Department of Energy for our cooperative energy-related grant program with Sinte Gleska University. This is especially significant given the current fiscal environment and sequestration situation for federal agencies.

Professional activities also are going well as I prepare to assume the duties of National President Elect for the American Institute of Professional Geologists (AIPG) beginning in January, 2014. Serving at the national level for AIPG has been highly rewarding, and I look forward to having a positive impact on the Institute as we focus on growing our membership and navigating the always interesting waters facing the geoscience profession nationally and internationally.

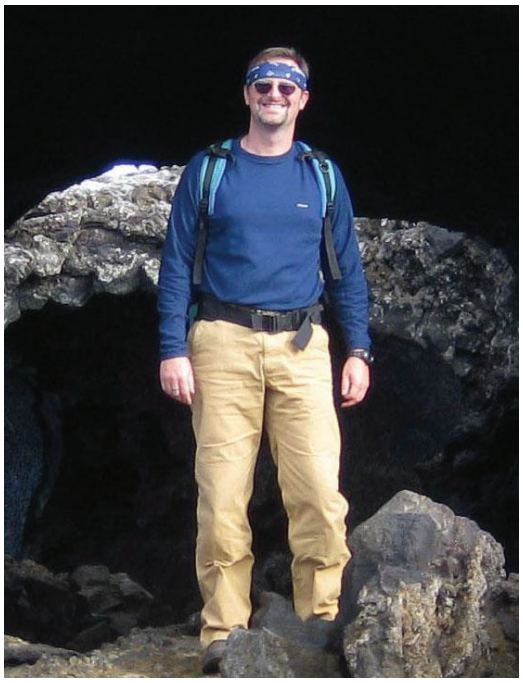
One other item of possible interest to our alumni and friends is the ferocious blizzard (Winter Storm Atlas) that occurred here in the Black Hills in early October, 2013. I got caught in the Mineral Industries Building at the beginning of the storm and ended up spending three days and nights in the MI building! It actually wasn't too bad as I had a major deadline that weekend and saved lots of time on the daily commute!

Happy Holidays and best wishes to all of the alumni and friends of the Department of Geology & Geological Engineering!

Tim Masterlark

I thoroughly enjoyed my first year as faculty at SDSMT. My research team reached critical mass this year and we are poised to engage the art of computational geodynamics. Mike Baranowski (M.S. student) is developing numerical simulations of the M9 2011 Tohoku Earthquake (Japan). Mike presented preliminary results at the Fall Meeting of the American Geophysical Union in San Francisco, CA. His work is supported by an NSF grant. Congratulations to Mike on his award of a fellowship from the South Dakota Space Grant Consortium. Ted Donovan (Ph.D. student) began work on developing methods to integrate finite element models into nonlinear inverse analyses of volcano deformation. Ted's work, an innovational blend of sophisticated numerical modeling and high performance computing, is supported by a grant from NSF. Dr. Jay Tung joined my research team in August. Jay is tasked with the challenging problem of building numerical models to earthquake-triggering and deformation caused by the coupling of stress and fluid pressure in the crust. Jay's work is part of a grant supporting collaboration of my research team and scientists from NASA's Jet Propulsion Laboratory.

Dr. Masterlark in front of a lava tube in the Northern Volcanic Zone, Iceland.



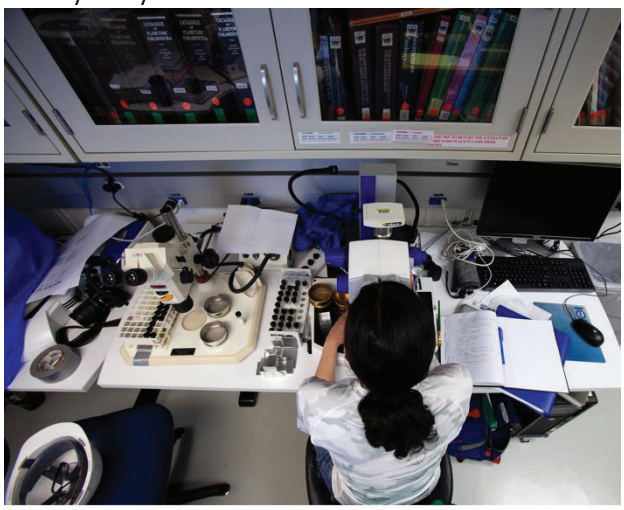
I was delighted to give an invited presentation at the Geomathematics 2013 Conference in Sankt Martin, Germany. Dr. Kurt Feigl (University of Wisconsin) and I delivered a workshop on using finite element models to simulate volcano deformation at the UNAVCO facility in Boulder, CO. This was the grand finale of a collaborative NSF grant Kurt and I completed last summer. I am pleased to report that one of my new NSF proposals was selected for funding and began in September. On the publications side, my colleagues and I published articles in *Computers in Geoscience*, *Journal of Geophysical Research*, and *Pure and Applied Geophysics*. A fourth article was accepted for publication in *Geophysical Journal International*. Funding agencies and journal editors kept me busy in 2013. In addition to a regular stream of proposal and journal article review requests, the FCT (Portuguese National Funding Agency) invited me to join an international collective of experts, which entailed reviewing 12 proposals during a two-week period. Finally, the journal Geophysical Journal International kindly recognized me as an Outstanding Reviewer for 2012.

Christina Belanger

Happy holidays everyone! This summer I spent two months in the Gulf of Alaska aboard the oceanographic drilling vessel the JOIDES Resolution on the Integrated Ocean Drilling Program's Expedition 341 – it was quite the adventure. I worked with a group of scientists from 13 different countries as well as an international crew. Our mission was to retrieve cores of ocean sediment from five different sites in the Gulf of Alaska to study the interaction of tectonics, climate, and sedimentation for the last ~10 million years. We retrieved 3.24 kilometers of sediment during the expedition and sedimentation rates were so high that we will also have millennial-scale data about climate change and changes in surface productivity. My role on the ship was as the benthic foraminiferal micropaleontologist, so I spent the majority of my time sieving mud from the "core catcher," picking sand-grain sized fossils from the coarse fractions, and identifying the species of foraminifera. By knowing the species of foraminifera, we were able to determine the water depth at the time of deposition and recognize times of sediment transport. Other micropaleontologists on board focused on planktonic foraminifera, radiolarians, and diatoms, which were all important for determining the age of the sediments as we drilled. Now that we are back on dry land, we have sampled the cores for shore-based research and I am beginning to process my samples to study changes in the benthic foraminiferal faunas and use the identity and geochemistry of the fossils as proxies for paleoceanographic conditions. I am especially interested in times where it appears the bottom waters in the Gulf of Alaska were depleted in oxygen and productivity was high. Next semester, I will have an undergraduate geology student and a graduate student from atmospheric sciences conducting research with these samples.

I also had fun this past year teaching Invertebrate Paleontology, Search for the Past, and Oceanography and am looking forward to teaching Micropaleontology next semester. I am also working on expanding our micropaleontology collection in the museum with specimens just collected in Alaska as well as from my past field localities in Oregon and the Bahamas. I've had three papers accepted this past year – one on the biogeography of modern molluscs, a second which was an international effort to put forth the 50 most important questions for paleoecology to answer in coming decade, and the third which combined

paleontological and geochemical data to determine the drivers of faunal changes on the Oregon Coast ~20 million years ago. In all, it was a very fun year!



[Photo 1: The JOIDES Resolution docked in Victoria, Canada where we boarded at the start of our expeditions.]

[Photo 2: At my workstation aboard the JOIDES – most of my time on the ship was spent at a microscope picking sand-grain sized foraminifera from the sediments we retrieved.]

Ed Duke

Ed Duke continues to split his duties three ways between geology, the NASA Space Grant Consortium, and the Engineering and Mining Experiment Station (EMES). In recent years EMES has collaborated across campus to acquire or upgrade analytical facilities in scanning electron microscopy (new energy-dispersive spectrometer and electron backscatter diffraction system), atomic force microscopy, and 3D x-ray microtomography. EMES also houses new Raman and UV-VIS-NIR microscopes that support interdisciplinary research in security printing and forensic science.

Ed recently received SD Board of Regents funding for a new hand-held visible and near-infrared spectrometer (shown at right), which he is hoping to use to study the distribution of high-pressure white micas next summer in Turkey along with Nuri Uzunlar and Alvis Lisenbee. He is also looking forward to presenting an invited keynote address on the spectroscopy of white micas in remote sensing and mineral exploration at the Australian Earth Sciences Convention in July in Newcastle, NSW.

Darrin Pagnac

Greetings and happy holidays to you and yours. I hope this holiday season finds you warm, successful and content. My year has been hectic, surprising, motivating and filled with accomplishments. I continue to ramp up my teaching and research activities and am becoming accustomed to the rigorous pace of a pre-tenured faculty member.

A few fantastic opportunities have presented themselves in the past year and I've done my best to maximize the potential they've offered. In May, I took a trip out to Albany, NY, to visit a colleague who works with the New York State Museum. Together, we have been working on using stable carbon isotopes to analyze the diets of Miocene horses. I spent a week with him learning some of the pre-analytical treatment techniques for preparing isotope samples. The process is tedious, but the results are fantastic, genuine proxies that help us determine diet in horses that have been extinct for fifteen million years. The results of our findings were published in the journal Palaeogeography, Palaeoclimatology, Palaeoecology in October. We were able to find evidence of modern C4 grasses in the diets of horses from southern California and pushed the earliest records of these grasses back from approximately nine to fifteen million years ago. More work is in progress.

I returned to the Little Houston Quarry in Sundance, WY, for a brief stint in July. There I led students and interested amateurs through the process of excavating and documenting late Jurassic dinosaurs from the Morrison Formation. The camp, as always, was a huge success. The weather cooperated this year and everyone had a blast.

Boyd and Calvello scouring the Pierre shale for fossils. Note the Crow Creek sandstone in the background

This year included a new addition to my field activities. I've begun leading annual surveys in the Cretaceous Pierre shale for the US Army Corps of Engineers along the Missouri River. Jim Martin had been conducting these surveys for the past two decades, but with his retirement I stepped in to continue this successful working relationship. I spent two weeks in Chamberlain, SD with our new Haslem postdoc, Clint Boyd, and my doctoral student, Mike Calvello. This survey was preliminary in all respects; the goal was to familiarize ourselves with the area and the geology. We have big plans for the survey next year; we will spend an entire month with students on the Missouri River surveying for marine reptiles and their associated fauna from the Western Interior Seaway. We had modest success this year in our findings as well. In a block of Niobrara chalk, Clint discovered the smallest piece of mosasaur skull I have ever seen. Turns out it was part of the skull of a juvenile in a concentrated bone deposit. We have since recovered more than a hundred associated fish and shark specimens along with more pieces of this adorable baby sea lizard.

In October I attended the annual Society of Vertebrate Paleontology meetings in Los Angeles, CA. Prior to the meeting I led a field trip to my dissertation site north of Barstow with colleagues Ian Browne and Kent Smith from Oklahoma State University. With about thirty participants we drove to Rainbow Basin and had a day-long tour of the middle Miocene Barstow Formation. The weather cooperated (other than the late fall Mojave wind) and everyone had a fantastic time.

This year I'm excited to see two of my graduate students finishing up their research. Joe Gandolfi is wrapping up his research on the first records of microfossils from *Stenomylus* Quarry at Agate Fossil Beds in western Nebraska. Joe will graduate in December with his MS in Paleontology. Huai-Pin Hu, my first doctoral student, has finished his research on the paleoecology of the Pleistocene megafauna of southern Taiwan. Beam has put in a tremendous amount of work and produced so exciting new results on large mammals from Taiwan. Beam will go through the hooding ceremony in December.

Pagnac pointing out some interesting features of the Barstow Formation

I continue to press onward with research projects and grant applications. The museum was fortunate enough to be awarded funding from the Institute for Museum and Library Science for digitization and archiving of Western Interior Seaway collections and archives. Together with all museum staff, we will begin implementing this grant during the spring

of 2014. These funds will allow us to begin to compile the extensive collection of Western Interior Seaway material accumulated by various researchers over that past few decades. I await with anticipation the new and exciting things we'll discover in the process.

I wish you the best of luck in the coming year. I hope that success and prosperity are prominent parts of 2014!

Colin Paterson

One M.S student (Andy Armstrong) completed his alteration study in the biotite zone host rocks in the Homestake gold deposit, and two other students are working on MS thesis research. Two new MS students in Economic Geology began in the fall 2013. Together with Dr Kelli McCormick (Mining Engineering and Management) and Dr Alvis Lisenbee, I am working on developing a research project on breccias and carbonatites at the Rare Element Resources project area in the Bear Lodge Mountains, Wyoming.

I spent 5 weeks teaching field camp with Alvis Lisenbee, Nuri Uzunlar, and Zeynep Oner in Turkey in the summer, and in addition to my regular classes, I taught the junior level Igneous and Metamorphic Petrology class in the fall for the first time.

The Society of Economic Geologists student chapter continues to be very active in the department with about 20 members involved in monthly meetings and field trips – the major trip to the Henderson and Climax molybdenum mines in Colorado coincided with the extended period of torrential rains in the Front Range area in September. Nevertheless, the mine tours were successfully completed. Special thanks to Freeport McMoRan and Chris Schmitz (BS GeoE 1983) for arranging the visits and covering the cost of our transport.

SEG field trip at the Henderson and Climax molybdenum mines, CO

From the Museum and Sally Shelton

Sally Shelton led the host committee for the 28th annual meeting of the Society for the Preservation of Natural History Collections, which was held at SDSM&T in June. This was a well-attended, productive meeting of curators, collections managers and other natural history museum professionals from around the country and the world. The SPNHC meeting included events at the Museum of Geology and PRL, the Journey Museum, and the Mammoth Site, as well as field trips to a variety of sites.

The Conference on Fossil Resources, which was supposed to have been held with the SPNHC meeting, will now meet on May 13-15 at SDSM&T. This will focus on the issues affecting fossils on public lands, including monitoring, mitigation, policy, research, and education. The CFR will be administratively based as SDSM&T for the foreseeable future.

Thanks to Jim Fox, Bill Schurmann and Mike Ryan, the collections of cores and cuttings made by J. Paul Gries over his career are now organized, re-boxed and shelved for better access. Jim is working to get these linked with Dr. Gries's archives and notes.

One of the summer highlights at the PRL was hosting the Passport in Time volunteer paleontology project sponsored by the U. S. Forest Service, under the direction of USFS regional paleontologist Barbara Beasley. The focus of this was teaching laboratory preparation techniques for volunteers who have already been trained in field techniques through paleontology projects on USFS lands in South Dakota and Wyoming. Among other specimens, several major dinosaur bones were carefully prepared and stabilized, including a ceratopsian brow horn. This is the first time that a PIT project has included a laboratory component, and the PRL facilities made this possible.

A dinosaur trackway slab belonging to the Museum of Geology has been installed as a long-term lobby exhibit at the Journey Museum. The serves as a focal point for guided tours of the Journey, emphasizing local paleontology and the work of the Museum of Geology.

Grant work includes research on stabilization of paper shale fossils from Florissant Fossil Beds National Monument in Colorado, inventories of National Park Service and Bureau of Reclamation specimens in the Museum collections, and digitization of all the Museum's Cretaceous Western Interior Seaway collections and archives.

The museum exhibits class planned, designed, and updated exhibits at the Museum of Geology, the Journey Museum, and the newly-opened Museum of the American Buffalo.

Along with National Park Service senior curator Dr. Greg McDonald, Sally Shelton will be recognized as Volunteer of the Year at the Mammoth Site of Hot Springs, Inc., for policy and advisement work that contributed to the Mammoth Site's successful accreditation by the American Alliance of Museums in 2013. The Museum of Geology is also seeking AAM accreditation, so this work is helpful to us.

Sally Y. Shelton, Associate Director
Sally.Shelton@sdsmt.edu
605.394.2487

From Black Hill Natural Sciences Field Station and Nuri Uzunlar:

I spent most of my summer flying from one camp to another. After spending part of the summer in Galapagos Islands with Alvis and Dan Kelley (instructor from Bowling Green State University) setting up a new field camp, I spent June and part of July in Turkey with Alvis, Colin and Zeynep (our new structural geology faculty) teaching field camp. Late July, we started our first field camp in Hawaii with Tim Masterlark and Larry Stetler. We spent three weeks on the big island studying lavas in Kilauea National Park, Mauna Loa and Mauna Kea with 16 students. Thanks to faculty members here at SDSM&T and your support, the Field Station now is the world-class field school and offers camps in the **Black Hills, Hawaii**, **Turkey, Iceland, India, Galapagos Islands** and **Nepal**.

Courses offered in the summer of 2014 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 12 - June 13
GEOL 410 (Ranch A - S2)	6	Field Geology	June 16 - July 18
GEOL 410 (Ranch A – S3)	6	Field Geology	July 18- August 22
GEOE 410 (Campus)	6	Engineering Field Geology	May 12 – June 14
GEOL/GEOE 412/512 Environmental Eng.	3	Science and Engineering Field Applications	May 20 – June 7
GEOL 412/512	2	Pegmatites of the Black Hills	July 14- 26
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 20- August 5
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 19 – June 8
India			
GEOL/GEOE 412/512 Environmental Geology	3	Science and Engineering Field Applications	No offered in 2014
Iceland			
GEOL/GEOE 412/512 Volcanology Field Camp	3	Science and Engineering Field Applications	July 28 – August 16
Galapagos Islands			
GEOL/GEOE 412/512 Volcanology Field Camp	3	Science and Engineering Field Applications	May 19 – June 8

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 Denver, Colorado 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.

I am leading the efforts on campus to establish interdisciplinary research and teaching efforts in energy resources through the Energy Research Initiative (ERI). We will establish two new programs:

1. Undergraduate Minor in Petroleum Systems: An 18-credit program including three core courses and 9 credits of approved electives in geology as well as in chemical, civil, electrical, geological, mechanical, and metallurgical engineering.
2. Graduate Certificate in Petroleum Systems: A 12-credit program of graduate-level course work. Both graduate students and outside professionals can enroll.

Participants will work with an advisor in their discipline to develop a suitable course program. Electives allow students to focus either on upstream exploration and production or on downstream refining. If the minor is successful, we will expand the program into an interdisciplinary major. To support this educational effort, the Black Hills Natural Science Field Station also is establishing a petroleum field camp.

My research efforts in Turkey expanding into central Turkey where we plan to study high pressure rocks. Ed Duke recently received SD Board of Regents funding for a new hand-held visible and near-infrared spectrometer which he is hoping to use to study the distribution of high-pressure white micas next summer in Turkey along with Alvis and I.

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 or Spearfish. 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