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UNIVERSITY OF WYOMING

SPRING 2005

FROM THE DEPARTMENT HEAD

Tim Drever



This is my last letter as department head—I shall be retiring this summer. Let me take the opportunity to reflect on three years as department head and 34 years as a faculty member at Wyoming. Three years seems like a very short time, but even in that time we have seen considerable change. **Charlie Angevine**, **Dave Fountain**, **Dag Nummedal**, and **Ron Steel** all left the department; **Jay Lillegraven** retired but continues to work in the building, as does **Don Boyd**. We have two searches underway now, for a paleontologist and a sedimentary geologist: we expect to be welcoming two new colleagues in the fall. Two things have struck me particularly in these three years: the collegiality of our faculty and staff—they have been a great bunch of people to work with—and the generosity of our alumni. The number of people who donate every year amazes me and has made my life as department head much easier because of the flexibility it provides. For any of you who are thinking of giving, the Board of Visitors of the A&S College has a program whereby they match any gift from a first-time donor up to a maximum of \$1,000. It's a great chance to give \$2 for the price of \$1! **Art Snoke** will be taking over as Department Head and **Carol Frost** as Associate Head. The department will be in good hands.

Looking back over 34 years some things have changed and some have not. We continue to be a first-rate research department with high visibility at the national and international level. On the other hand, we still attach great importance to our undergraduate programs and to a master's program that trains students for careers in industry. Oil company recruiters tell us that we are one of their top five schools in the country. Our research has become more diverse, with a greater emphasis on geophysics and on submarine geology. One thing that has not changed is our belief in the importance of fieldwork, although "fieldwork" now may be collecting seismic data on a research ship or samples from the sea floor in a manned submersible. Two of our great strengths, strengths that help us attract the very best graduate students, are our continued commitment to field-based studies and the high level of cooperation among faculty members in different subdisciplines in the department. It's been a great place to work for all those years.

Although I am retiring I don't intend to disappear, and I look forward to maintaining contact with many of you in the years ahead.

DEPARTMENT OF GEOLOGY AND GEOPHYSICS

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Department Head **Tim Drever** will be giving the Geochemical Society's presidential address, on the Society's 50th anniversary at the 15th Annual Goldschmidt Conference, to be held in Moscow, Idaho, May 20–25. The title of the address will be: "Silicate weathering: where have we come in 50 years?"

Last November, **Drever** also gave an invited talk at the Mexican Reunión de Ciencias de la Tierra in Querétaro, Mexico titled: "Mineral Weathering and Surface Water Chemistry: Local and Global Questions."

Professor **Carol Frost** was awarded a research grant from NSF entitled "Magma-host rock interaction processes of assimilation in the mid-crustal Hortavaer intrusive complex, north-central Norway." The three-year award of \$167,600 starts Jan. 1, 2005. The first field season starts in July, and includes work on the island of Vega, a World Heritage site.



Professor Carol Frost

Frost is also a co-leader on a new UNESCO-funded International Geoscience Programme (IGCP-510) entitled "A-type granites and related rocks through time." The purpose of IGCP projects is to bring together scientists from developed and developing countries to promote research and training opportunities and to enhance scientific understanding of the Earth system.

A-type granites and related rocks are of enigmatic origin. Some are associated with valuable commodities such as tin, fluorine, niobium, gold, silver, and rare earth elements. The Sherman batholith east of Laramie is one of the best examples worldwide of an A-type granite. Studies by Carol Frost and **B. Ronald Frost** and their students have led to new hypotheses about the origin of these rocks, and these ideas formed the basis for the new project.

IGCP-510 is led by Carol Frost and by Roberto Dall'Agnol of Brazil and Tapani Ramo of Finland. The general aim of the project is to examine the petrology, geochronology, geochemistry and metallogeny of A-type granites in various tectonic settings through geologic time. The five-year project involves annual workshops and field trips to important A-type granite occurrences. The first meeting will be held in May 2005 at the Goldschmidt conference in Moscow, Idaho. A field trip led by Carol Frost across the Snake River plain and into Yellowstone National Park will focus on Neogene to Recent A-type volcanic rocks. Geologists from more than 15 different countries will participate in this and the other activities, which in future years will take place in Brazil, South Africa, China or Australia, Corsica, and Baltica.

Randi Martinsen, faculty advisor to geology's student clubs, announces that the American Association of Petroleum Geologists (AAPG) Student Chapter has purchased and donated four books to the Brinkerhoff Earth Science Library.

Research Professor **Kevin Chamberlain**, participated in Earthtime II, Oct. 22–24, 2004, an international workshop funded by NSF to calibrate U-Pb and Ar/Ar dating methods and to improve reproducible precisions of both methods to 0.1%. The effort will have direct applications to the geologic timescale and determining durations of geologic events, with implications for climate change, global warming, extinction rates and evolution. The

workshop included 40 scientists who are currently involved in interlaboratory calibration experiments to maximize precision and accuracy. The results will ultimately serve as a resource for the rest of the geochronologic community.

A total of 34 individuals from the department, including faculty, research scientists, and graduate students, were involved with presentations at the 2004 Annual Meeting of the Geological Society of America (GSA), held in Denver, Colorado, Nov. 7–10.

Professor **Steve Holbrook** was recently awarded a grant of \$181,743 from NSF's Physical Oceanography program for a project entitled "Quantitative investigation of fine structure and internal waves in the Norwegian Sea from simultaneous temperature and acoustic reflectance measurements." This grant represents an exciting new research direction called "seismic oceanography," which is an outgrowth of a recent discovery made by Holbrook's group that marine seismic reflection data acquired to study



Professor Steve Holbrook

geological structures beneath the seafloor can also produce startling images of temperature structure in the ocean. Holbrook's group (including postdoc Joel Seymour and grad students Papia Nandi and Pedro Paramo) presented three papers on this topic at the

American Geophysical Union meetings in December in San Francisco, and Papia published a paper in *Geophysical Research Letters* in December on the topic.

Holbrook was also awarded a \$1.4 million grant from the National Science Foundation's MARGINS program to conduct a seismological study of the volcanoes of Costa Rica. The project included both onshore and seagoing research, beginning with a large seismic survey that crossed the Central American isthmus from the Pacific to the Caribbean in January–February, 2005. The department was proud to be involved with this valuable research and we sent two postdocs, five graduate students, and two undergraduates to participate in the fieldwork.

Associate Professor **Mike Cheadle** has been invited to give a keynote address at a Kibbe Science symposium at Bowdoin College in Maine in April. He is one of four invited international speakers at the Symposium that will attract students from the whole of the northeast.

Professor **Barbara John** has been chosen as one of six Joint Oceanographic Institutions (JOI) Distinguished Lecturers for the academic year 2005–2006. As part of the lecture series, she will travel to U.S. academic institutions to present a talk entitled “Understanding slow spreading mid-ocean ridges: how do they work?” during the next academic year.

Ph.D. students Craig Grimes and Josh Schwartz with **John** and **Cheadle**, and colleagues from Woods Hole Oceanographic Institution and Stanford University are presenting papers entitled “U-Pb dating of hydrothermal zircon: space fracturing and fluid flow in mantle peridotite at the MAR” (C. Grimes), and “Inherited zircon and the magmatic construction of oceanic crust” (J. Schwartz). Their presentations will be at the Goldschmidt Conference of the Geochemical Society, as part of a symposium on the applications of geo-

thermochronology to tectonic processes led by Professor Peter Reiners of Yale (son of William Reiners, Professor of Botany and Director of Wygisc).

Professor **Art Snoke** recently authored a paper entitled: “Southern Cordillera” for the newly released “Encyclopedia of Geology” published by Academic Press. This article covers the tectonic evolution of the western North American Cordilleran mountain belt from ~47 degrees N to ~16 degrees N, an area that extends >4500 km. Snoke has studied the geologic evolution of various parts of this complex mountain system for over 30 years.



Professor Art Snoke

Snoke and graduate student Sarah R. Garlick were awarded an EDMAP grant from the U.S. Geological Survey for the amount of \$11,548 for 2005–06. The title of their project is: “Partial crustal cross-section through an ophiolitic melange: Kangaroo Mountain-Figurehead Mountain area, California.” This field area straddles the Pacific Crest Trail in the Siskiyou Mountains of northwestern California.

Research Scientist **Derek Schutt** has been presenting his latest work with Professor **Ken Dueker** on the Yellowstone Hotspot at meetings and seminars, including faculty seminars at Northwestern University and New Mexico State University, and the

American Geophysical Union Fall meeting in San Francisco. In addition, two papers of his have been accepted for publication in the *Journal of Geophysical Research*: “The Density and Velocity Effects of Melt Depletion,” by D.L. Schutt and C.E. Leshner, and “Shear wave anisotropy of the Yellowstone Hotspot,” by G. Waite, D.L. Schutt, and R.B. Smith.

Schutt has continued his funded work on the density and velocity effects of melt depletion with a colleague at UC-Davis, and has been appointed a Visiting Scholar at Northwestern University, to research the Wyoming Craton seismic structure. He also has several seismology projects on the Yellowstone area in progress with Prof. Ken Dueker.

Adjunct Professor **Mike Boyles** of UW's Enhanced Oil Recovery Institute (EORI) will lead the stratigraphic portion of the Geology Science Field Camp this year. They will visit a new location in Utah.

Students will spend a week studying world class exposures of Cretaceous deposits in the Book Cliffs of Utah. New field exercises will include investigations of fluvial and wave dominated deltaic deposits as well as superb exposures of some fluvial deposits. Students will learn how to apply sedimentologic and stratigraphic observations to understanding depositional systems and facies architecture. Mike's background in the oil industry and extensive experience leading industry field trips will provide the students with an applied perspective, as they examine some of the finest stratigraphic outcrops available. 🌿

Congratulations!

Professor **Mike Cheadle** was recently selected as a Top Teacher by the UW graduating class of 2005.

GEOLOGISTS AT SEA



Over the past few years, Professor **Barbara John** and Associate Professor **Mike Cheadle** have built a marine research group, which is studying plate tectonic processes in the deep oceans. The group currently includes six graduate students, **Kay Achenbach**, **Scott Badham**, **Graham Baines**, **Craig Grimes**, **Elena Miranda**, and **Josh Schwartz**, three of whom got to go to sea on exciting cruises this last winter. Read on to find out more.

Woods Hole Oceanographic Institution Cruise

For five weeks during November and December 2004, Associate Professor Mike Cheadle and doctoral students Kay Achenbach and Josh Schwartz sailed on the U.S. research vessel *RV Knorr* to survey the Kane Fracture Zone on the Mid-Atlantic Ridge at the tropical latitude of 23° North. Mike, Kay and Josh were invited to participate on the NSF funded cruise by the Woods Hole Oceanographic Institution. They together with five scientists from Woods Hole and one from the University of Idaho formed the scientific team. The cruise started off very well, sailing from the island paradise of Bermuda, but the harsh realities of winter returned when they sailed home to the cold and wintry home port of Woods Hole on Cape Cod after their trip.



The U.S. research vessel, *RV Knorr*, the same ship that Bob Ballard used to find the *Titanic* in 1985.

The cruise was designed to investigate the origin of the Kane Fracture Zone oceanic core complexes, which are smooth km-scale domal features formed by low-angle normal faults similar to those found in the southern Basin

Range in Arizona. These features were recognized at several places along the Mid-Atlantic Ridge about 10 years ago, but remain poorly understood, because of the difficulty (and expense!) of doing geology beneath 1–4 km of the ocean water. The cruise used the new *Jason II* remotely operated submarine to dive to the sea floor and film and collect rocks as well as the Automated Benthic Explorer (*ABE*), a totally automated submarine that looks a little like the starship *USS Enterprise*, to film and map areas of the sea floor with a one meter resolution! In the end they collected three tons of rocks or nearly 1,200 specimens, the biggest haul ever from an oceanic core complex. Mike has 220 of these specimens currently filling the outside room of his office. Both Kay and Josh will work on various problems associated with these rocks, as will a new student, Kelsey McArthur, who starts in August.

This collection of rocks is probably the most important ever recovered from an oceanic core complex and hopefully it will help us solve some of the last remaining questions regarding plate tectonics at Mid-Ocean Ridges. The first results should be presented at the American Geophysical Union Meeting in San Francisco in December.



Mike on deck looking at one of the rock samples just recovered.



ABOVE: "All dressed up and ready for rock surgery" (rock cutting). Mike and graduate student Jessica Warren (Woods Hole Oceanographic Institution). BELOW: Mike documenting the metamorphism of one of the 1200 samples that were recovered.



IODP Expedition 304

Farther north on the Mid-Atlantic Ridge (30°), Professors Barbara John and Ron Frost along with doctoral student Craig Grimes spent Thanksgiving, Christmas, and New Year aboard the drill ship *JOIDES Resolution*. Their days were shared with 23 additional scientists, and 80+ crew, drillers, and roughnecks. It was an interesting experience having their working holidays at sea, and one they certainly will not forget.



ABOVE: Barbara "Bobbie" and Greg Hirth (structural geologist, Woods Hole Oceanographic Institution), discussing details of the core before cutting.

At sea, John served as co-chief scientist on the \$8 million Integrated Ocean Drilling Program (IODP) Expedition 304 aimed at reaching the

Mohorovicic discontinuity (Moho) beneath thin crust along the slow spreading the Mid-Atlantic Ridge. Bobbie, Ron and Craig all flew from Laramie to Denver, on to Frankfurt and Lisbon, and finally back out into the Atlantic Ocean to Punta Delgada on the Portuguese island of San Miguel in the Azores. There they boarded their floating home, and continued to head west to the Mid-Atlantic Ridge where they resided for over 40 days and 40 nights drilling basement rock roughly 2 million years (15 kilometers, or ~10 miles) west of the ridge axis.

One goal of this expedition was to try and fulfill the elusive objective of drilling across the Moho and into fresh mantle peridotite. Over 40 years ago, the first scientific deep drilling effort was initiated with 'Project Mohole'—an effort to reach the Moho and into the mantle. This project had the prominence of the space program, yet to date has been impossible to accomplish. Despite the ease they had in drilling a hole to 1,415 meters below seafloor



"Don't touch that core"..... When core comes out of the drill hole and is laid out on the 'catwalk', everyone wants to see what is recovered. In this case, (from left to right) Margot Goddard (Montpellier, France), Mike Storms (IODP, Texas A & M), Anthony Morris (UK), Barbara John (Univ. of Wyoming), and Jay Miller (IODP, Texas A & M) are having a look. John says 'don't touch' to Miller until after the technicians have had a chance to label all pieces of rock, so that no confusion can ensue.

(the second deepest hole in the history of ocean drilling), they found extreme complexity in the ocean crust, and did not reach fresh peridotite. They did, however, recover the best documented, and most complete section of primitive gabbroic rocks ever collected, and showed that slow spreading ocean crust in these settings is far more complicated than predicted by seismology. 🌀



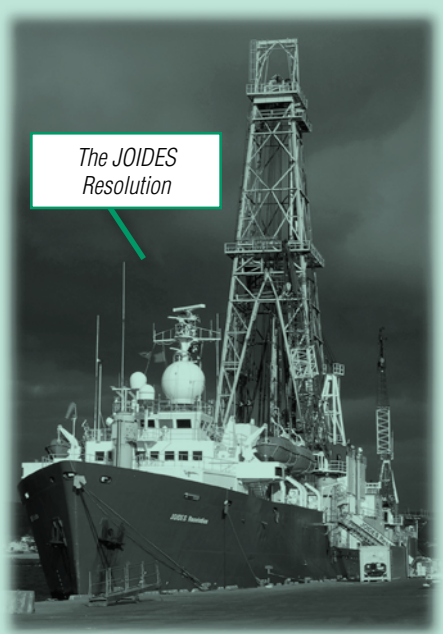
Prof. Ron Frost



UPPER LEFT: A tropical sunset on the *RV Knorr*, framed by parts of *Jason II*'s hardware. ABOVE: Re-entry cone deployment aboard the *JOIDES Resolution*. BELOW: Inside the *Jason II* control center aboard the *RV Knorr*.



The *JOIDES Resolution*





Ph.D. Candidate Receives Prestigious Award

In February of this year, **Graham Baines**, a Ph.D. student of Professor **Mike Cheadle**, was awarded a Schlanger Fellowship for one year by the Joint Oceanographic Institute's U.S. Science Advisory Committee. This is a very prestigious award, with only three being given out each year in the whole of the United States for graduate students researching marine geology and oceanography. He is the first University of Wyoming student to receive this award. During the tenure of the fellowship, Graham will determine the accretion rate of oceanic crust at Atlantis Bank in the Southwest Indian Ocean using uranium-lead zircon geochronology. This work will hopefully answer fundamental and poorly understood questions about how the Earth's crust grows beneath the oceans.

At the conclusion of his award, Graham will be invited to Washington DC, with other Schlanger fellows, to learn more about science program management in Washington. He will interact with program officers at NSF, meet congressional aides and perhaps even Wyoming congressmen. He will also receive "science and the media" training in order to improve outreach between the scientific community and the general public.

"Travis Kinley: A Student's Success Story in the Making"

Undergraduate student **Travis Kinley** knew from a young age that he wanted some kind of a career in the geology field. The local industries as well as the geological surroundings are what originally sparked Travis' interest in geology. What he did not know was what specific area he wanted to specialize in. However, during his

college life, with the help of the Geology and Geophysics Department at the University of Wyoming, Travis would find his calling in the area of Petroleum Stratigraphy.



Ph.D. candidate Graham Baines

Travis was born and raised in Casper, Wyoming. Casper is well known for its connection to the coal, oil, and natural gas industry. Travis began his college experience by first earning an associate's degree at Casper College, Wyoming's first Community College. He then transferred to UW's Geology and Geophysics Department

in the spring of 2004. As his time with the department progressed, he began to become more and more interested in certain areas of geology. This became even more apparent after he spent a couple of summers and Christmas breaks interning as a geologist for Double Eagle Petroleum, a petroleum company in his hometown. Travis had plenty to do during his internship experiences, "Oh man, I had lots to do!" says Travis, "I had to perform several well log analyses, as well as map several well sites around Baggs, Wyoming, a small town in the southwest corner of the state. My job duties also required a lot of field work, but all in all, I enjoyed the whole experience!"

Travis also received a lot of advice pertaining to his choice of major from senior lecturer and faculty member **Randi Martinsen**. "Although all of the faculty at the department were very helpful in giving me career advice, Randi was also willing to assist me with my proposal, which looks at the hot topic of Coal Bed Methane (CBM), and gas production in the state of Wyoming," explains Travis. "It is largely known that the Powder River

Basin is covered with CBM wells; and no, those are not weapons of mass destruction. However, my proposal focuses on the Eastern Washakie Basin, and how that area is being developed for CBM wells."

The next step in Travis' college journey, will find him attending Texas Christian University, where he will pursue his master's degree. Based on his track record, we at the Geology and Geophysics Department are confident that Travis will continue his success story, which is still in the making.

Student Receives New Scholarship

Last October, undergraduate student **Johanna Wells**, a senior from Dubois, Wyoming, became the first recipient of the Anne Kirtland Selden Lowe Geology and Geophysics Scholarship. The memorial scholarship was established by R. Stanley Lowe, in honor of his wife Anne. Lowe, along with his son Ron, attended last October's Homecoming party in order to meet Johanna Wells and talk to her about her academic plans and goals. ♪



From left to right: Department Head Tim Drever, Johanna Wells, Mr. R. Stanley Lowe, and Mr. Rob Lowe.

Look for further details about scholarship awards in future issues!

GRADUATE SYMPOSIUM 2005



Each year, the Graduate Student Symposium, sponsored by the UW Graduate School, showcases graduate student achievements, fostering interaction among graduate students in diverse disciplines and promoting broad-based literacy in graduate education. It also gives students a chance to enhance presentation skills for broad audiences and build their resumes. This year it was held in the Yellowstone Ballroom of the Wyoming Union on April 4-5, 2005.



Graham Baines

Oral Presentation

EVOLUTION OF A TECTONIC PLATE BOUNDARY: MAJOR CHANGES IN THE GEOMETRY OF THE SOUTHWEST INDIAN RIDGE SINCE 26 MA.
With M.J. Cheadle, B.E. John, and A. Hosford Scheier (USGS)



Tyler (TJ) Fudge ✂ **Session Winner**

Oral Presentation

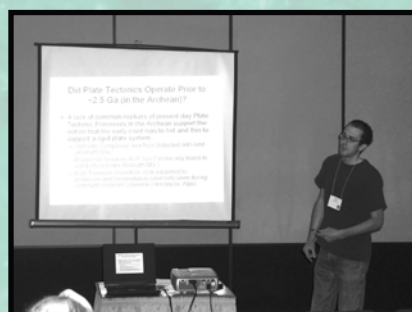
WATER FLOW AT THE BED OF A GLACIER: INSIGHTS FROM BOREHOLD OBSERVATIONS.
With Neil Humphrey



Matthew Hoskins ✂ **Session Winner**

Oral Presentation

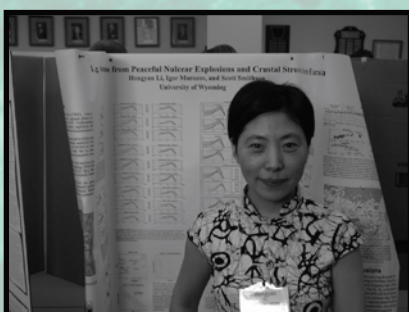
MODELING GLACIER RESPONSE TO CLIMATE WARMING IN THE CHUGACH MOUNTAINS OF ALASKA.
With Neil Humphrey



Patrick Hughes

Oral Presentation

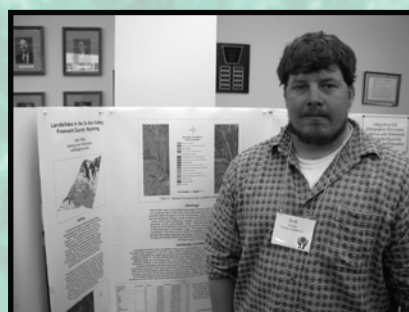
HIGH-PRESSURE GRANULITES FROM THE ARCHEAN TETON RANGE, WYOMING AND THEIR IMPLICATIONS FOR PLATE TECTONIC PROCESSES.
With Ron Frost



Hongyan Li

Poster Presentation

LG AMPLITUDE RATIOS FROM PEACEFUL NUCLEAR EXPLOSIONS AND COASTAL STRUCTURE IN NORTHERN EURASIA.
With Igor Morozov and Scott Smithson



Seth Wittke

Poster Presentation

LANDSLIDES IN THE DU NOIR VALLEY FREMONT COUNTY, WYOMING.

More Student News

Undergraduate student Laura Vietti, is going to do her senior honors thesis in central Norway with Prof. Carol Frost. She'll be the first student supported on the new NSF grant mentioned on page 2 under the "Faculty News" section.



STUDENT PROFILE — KAY ACHENBACH



Kay Achenbach's WHOI Cruise Experience

On the morning that Mike Cheadle, Josh Schwartz, and I left for our cruise—November 11—it was still dark outside, and the howling wind at the Laramie Airport was so cold that I thought I might lose some fingers carrying my bag inside. By 9 p.m. that night, after an hour of flying over pitch-black water, the island of Bermuda appeared below the airplane, glittering in perfect outline against the dark ocean. The next morning, crowded against the wharf in the middle of the balmy, pastel town of St. George, we got our first glimpse of the *RV Knorr*, the ship that would be our home for the next 35 days.

The cruise involved the use of two remotely operated vehicles, and a comprehensive dredging program designed to provide a broad overview of the rocks on the seafloor in this location. One of the ROV's, called *ABE*, is a robot that looks like the Starship Enterprise and can autonomously survey the seafloor for approximately 18 hours at a time, leaving the ship free to carry out the dredging operations. The other, *Jason II*, has maneuverable arms for picking up rock samples, and is attached to the ship via cables that transmit a live video feed to the watching scientists. Because the science operations on these expensive research cruises are always carried out around the clock, several scientists have to be awake at all times; thus, once we arrived on-site and started working, all of the academic scientists on board were

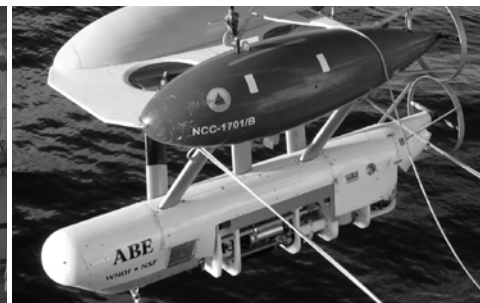
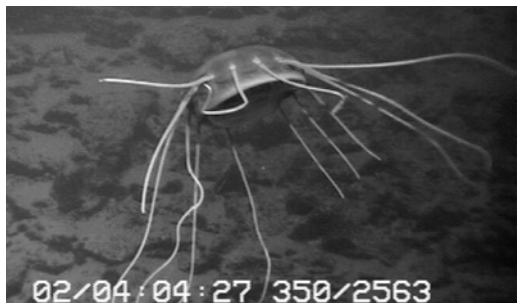
assigned to two four-hour watches per day. My watch was from 4 to 8, a.m. and p.m.

As soon as the watch schedule began, everyone fell into a routine, and, with no weekends or changes of scenery, time began to blur. I would get up at 3:20 a.m., and by 3:50 a.m. I was taking over from Josh, who had not yet been to bed. At times this got rather confusing, because what some people referred to as "last night," I would have considered to be "this morning." When *Jason* was in operation, I would spend my watch recording field notes on what we could observe through *Jason's* cameras. On the other days, we would work with the rock samples we had collected. This would include cutting rocks, weighing rocks, labeling rocks, taking pictures of rocks, describing rocks, putting rocks in bags, putting labels on the bags, storing the rocks in buckets, putting labels on the buckets, etc. Altogether, we got over 6,000 pounds of rocks, many of which were quite small and each of which had to be described, so we had plenty to do. As one of the most junior scientists on board, it became my job to make sure the spreadsheets that contained all the compiled information about the rocks were up-to-date. Upon the end of my first four-hour shift, I was always ready for breakfast! By the time my second shift ended at 8 p.m., it was all I could do to wait for the last of the day's four e-mail downloads before staggering off to bed.

Between 8 a.m. and 4 p.m., I had an eight-hour gap of unscheduled time. Every day I would spend at least part of this time catching up on all the work that would only get more overwhelming with each load of rocks that came on board. Sometimes, I would do my laundry, or chat with one of the many interesting people on board, or take a much-needed nap. My favorite thing to do with any spare time, however, was to go out onto the bow of the ship, sit in a little patch of shade beneath the upper deck, and listen to the sound of the waves slapping against the hull.

Aside from Thanksgiving, which was marked by what was easily the best turkey and stuffing I have ever had (sorry Grandma!), all of the days blend together in my mind. Despite the anxiously anticipated e-mail, for 35 days it felt like the world had shrunk to the size of a 280-foot-long boat, and contained about 50 human beings. When we disembarked at Woods Hole on December 17, I remember walking about a hundred yards away from the *Knorr*, turning around to look at it, and feeling amazed that such a vivid, once-in-a-lifetime experience could be wholly contained within a single vessel that looked so small. 🐙

---If you are a student and would like to be in our *PROfile* newsletter, please contact our editor Brendon Orr at borr@uwoy.edu---



ABOVE LEFT: One of many strange undersea creatures spied through *Jason II's* cameras. ABOVE MIDDLE: (Left to Right) Clare Williams, WHOI grad. student; Kay Achenbach (UW); Bridget Deifenbach, University of Idaho grad. student, waiting for the crew to fish *ABE* out of the water. ABOVE RIGHT: *ABE*, an automated submarine, being dropped off the side of the *RV Knorr*. *ABE* maps the sea floor on its own and then gets picked up by the ship.

STUDENT PROFILE – CRAIG GRIMES



Craig Grimes' WHOI IODP Cruise Experience

Peering from the starboard side window of my Airbus A310 Jet I could make out a variety of ships in the Ponta Delgada harbor, but only one had a 200 foot drilling derrick lit up like a Christmas tree towering above it. It was the *JOIDES Resolution*, and it was to be my home for the next 52 days. We had finally arrived in the Azores after months of planning and preparation, and my curiosities and apprehensions regarding the coming month's activities were plenty.

Our mission over this time was two-fold: 1) locate a suitable drill site and set up a good quality hole that would be deepened by the following cruise, and 2) drill through the hanging wall and detachment fault surface on an oceanic core complex. But this wasn't on my mind as we moved onto the ship. The *Resolution* is a 470-foot long vessel equipped with a 202-foot tall drilling derrick. Cut near the middle of the ship is a large 20 x 20-foot square hole, called the moon pool, through which the drill pipe passes to the seafloor. The most important part of the ship was near the stern. This is where the sleeping quarters and lab stacks were located. Rooms usually contained two bunks and four lockers, and two such rooms would then share a bathroom located in between. My room also boasted its own restroom, so I was setup quite well. Unfortunately the room was right next to one of 12 thrusters used to keep the ship stationary, so once on site we had a mind-numbing hum to help us sleep.

After leaving port, we had several days in transit to adjust to the motion of the ocean, fall into our routines, and get prepared. We soon arrived on site at 30° N in the middle of the Atlantic Ocean and commenced drilling. For the science staff, this meant really getting to work.

"Work" consisted of describing sections of 3-inch diameter drill core that magically appeared on deck every hour or so. The science team was divided into groups, and assigned to three different twelve-hour shifts for describing core and thin sections. My group had the 8 a.m. to 8 p.m. shift. Duties were split up as well, such that every person had specific aspects of the core to describe. I examined every inch of recovered core and recorded the location and orientation of veins. I then transferred the data to a spreadsheet, plotted it up, and eventually wrote up a summary for each hole.

Although we spent long hours describing core and sitting at computers, there were many other activities on the ship. The first distraction was an 11 a.m. science meeting attended by everyone in order to recap the days drilling and discuss observations or problems. These were immediately followed by lunch, which I generally thought to be quite good. The catering crew went out of its way, especially on holidays, to cook up some tasty meals. The rest of our day was spent in the lab stack, with

occasional coffee and cookie breaks, and the inevitable sunset break. I have never seen sunsets so spectacular as those we watched at sea from the helipad.

Following our long shifts, I would often find myself down in the gym for a short workout. This was a rare time to relax for me, and a time to sometimes be alone either rowing, jogging, or lifting some weights. I quickly realized this task took much more concentration when the weight room was moving from side to side!

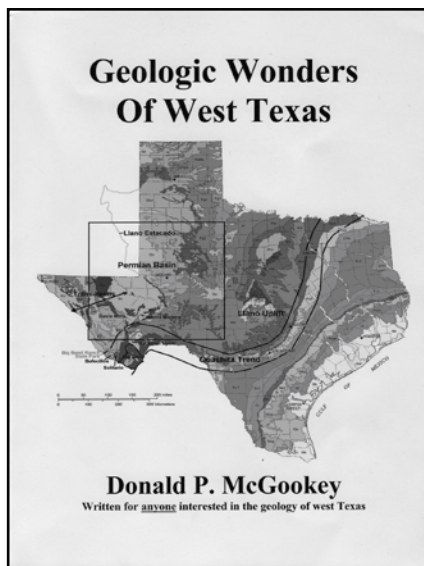
Holidays came and went, and the days seemed to blend together. In a flash, we had drilled multiple holes, recovered over 300 meters of rock, and completed the bulk of our mission, despite some minor setbacks. We all put the finishing touches on our reports, and then steamed ahead with the wind pushing us the whole way back to the Azores. We arrived in the evening, just as we had left, and eagerly awaited the placement of the gangplank. We excitedly disembarked and headed straight for the bar, it had been a dry ship. As we quickly walked towards the bar, I turned, and couldn't help but feel a bit sad—she (*JOIDES Resolution*) had been a good ship, and I would always remember the experiences that I had and the friends I made aboard. 🌊



ABOVE LEFT: Craig Grimes (left) types structural data into the shipboard computer database aboard the *JOIDES Resolution* while Dr. Take Herose (University of Kyoto) assists. ABOVE MIDDLE: Craig (left) and Andy McCaig (right, Leeds University, UK) discussing details of recovered gabbo in the core description lab on the *JOIDES Resolution*. ABOVE RIGHT: Craig measuring structural data in core 1309D on IODP expedition 304.



Donald P. McGookey (M.S. '52) recently donated to our library a copy of his latest book: *Geologic Wonders of West Texas*. Its 210 pages are profusely illustrated with colorful maps, diagrams, and outcrop photos. The text features nine areas (e.g. Big Bend; Permian Basin) and, as the cover states, is written for anyone interested in the geology of West Texas. Interested in obtaining a copy? Contact Don at dmcgookeys@juno.com. After nearly three decades of employment with Texaco, Don retired in 1979 as manager of exploration in Midland, Texas. Since then he has been an independent geologist working primarily in the Permian Basin.



Geologic Wonders Of West Texas, by Donald P. McGookey.

Ann Lundberg (B.S. '89) is an assistant professor of English at Northwestern College where she teaches Early American Literature. In September 2004 her essay, "The Ruin of a Bygone Geological Empire": Clarence King and the Place of the Primitive in the Evolution of American Identity" was published in *ATQ*, a *Journal of 19th Century American Studies*. Her essay on King is part of a larger work in progress on the literary representation of geology in nineteenth-century America. She has also published material on John Muir's geological studies of Yosemite. For the

past 10 years, she has worked on and off as a seasonal Park Ranger for the National Park Service, in which capacity she continues to teach and write about geology.

John Cutler (B.S. '60) has donated several photos of historical interest, two of S.H. Knight working on the Apatosaurus display in the Geological Museum, one of the foot bridge at science camp, and one of Paul McGrew debating fossil identification with his Harvard friend Bryan Patterson. John is currently serving as Mapping/GIS director for Ozark Regional Land Trust.

Dr. **Emmett Evanoff** (B.S. '78) returned to the Geology and Geophysics Department on January 31st, as a speaker in our Distinguished Lecturer Series. His talk, "Cenozoic History of the Laramie Mountains," was based on his extensive field work in southeastern Wyoming. Professor emeritus Don Boyd introduced Dr. Evanoff.

AAPG Officer Candidates Announced

AAPG Nominating Committee chairman Marlan W. Downey has announced the slate of candidates, who will stand for AAPG election for 2005-06. The president-elect winner will serve as AAPG president in 2006-07. One of the president-elect candidates is alumnus **Thomas Ahlbrandt** (B.S. '69; Ph.D. '73). Online balloting will be available in the spring of 2005 at www.directvote.net/aapg2005. Ballots will be counted on May 16, 2005.

CSM Symposium Honors Past AAPG President Weimer

A two-day symposium to honor past AAPG President Dr. **Robert Weimer** (B.S. '48; M.A. '49) was held on Nov. 4-5 at the Colorado School of Mines,



S.H. Knight working on the apatosaurus display in the UW Geological Museum.

Golden, Colorado.

"WeimerFest," sponsored by the Rocky Mountain Association of Geologists and the Colorado School of Mines' departments of Geology-Geological Engineering and Geophysics, also celebrated the school's 130 years of earth science programs.

Activities included tours of the school and a field tour, "Mines Geology Trail-Record of the Front Range Uplift," featuring a new guide written by Weimer. ~

Horace D. (Bill) Thomas selected for Arts & Sciences Board of Visitor's Outstanding Former Faculty Award

Thanks to some hard work by Selmer Peterson, Bob Weimer and many others, we are proud to announce that all the efforts to get Bill Thomas selected for this award were successful!

The Outstanding Former Faculty Awards honor A&S faculty who have had a special impact on students, A&S programs, their academic discipline, and/or the public.

There is an awards banquet in Laramie on Friday, May 13, 2005.

We thank you for your support and letters!

Gathering news!

Please take a minute to fill out the Alumni News Form insert and let your fellow UW Geology and Geophysics grads know what you're up to. Where you are. Who you've become.



A Report From the Geology Computer Support Team!

Computer Support Manager, **Tim Brewer** announces the arrival of the new plotter (also named Prism). It can print on 36" to 42" paper and has UV resistant inks.

Recently the department purchased a new Web server, which arrived in March 2005 and is now in production. The new Chronos has a much larger storage capacity and a faster response time for serving web pages.

We are again reviewing the Web-site structure. The entire tech team is considering changes in layout. We are considering re-developing the Website under Linux. Doing this will allow better management and improved up time of the site. The Web site committee along with several faculty members, who have been involved with our Web site in the past, will be involved in this process.

The team also reports that we have installed a lot of new software, rebuilt a number of computers, and replaced graphics cards in a variety of computers. We also rebuilt a number of machines (13+) around the department.

-- **Tim Brewer, Reid Fletcher, and Jeff Lang**

Staff News

Our own Accounting Associate **Carmen Candelaria** was recognized for her 30 years of service to the University of Wyoming. *Congratulations Carmen!*

Congratulations to **Sally Scott** who was chosen as the Agnes Milstead Distinguished Librarianship Award winner! The Milstead Award honors individuals who have made a significant contribution to the Libraries. Sally has provided excellent service in making the Brinkerhoff Library an effective facility for the university through the selection of resources, promotion of geology information, development of an outstanding map collection, and excellent relations with the Geology faculty and staff.

EORI/IER Update

Director **Jim Steidtmann** reports on latest EORI/IER news.

The last couple of months have been very busy for the EORI staff. Our efforts to form cooperative associations with Wyoming producers have resulted in agreements with three Wyoming producers. The UW EORI team will build history matched "Darwin/Madison and Cambrian" reservoir models for Merit Energy Company's Wertz and Lost Soldier fields. An agreement has been formed with Wold Oil Properties to conduct a reservoir characterization and simulation for the Tensleep Formation and Wold's Mahoney Dome field. And a geological characterization of the Second Frontier Sandstone at their Brooks Ranch Field will be conducted for Nerd Gas Company, LLC.

The Institute has also joined the Big Sky Carbon Sequestration Phase II Partnership, a DOE funded partnership. As a member of this partnership, we will investigate the chemical, mineralogical and textural changes related to long term CO₂ injection in the carbonate reservoirs at Lost Soldier field. We anticipate that this study will provide important information that can assist in making CO₂ EOR efforts more successful. (For more information on our current projects, see our 'current projects' link on our web site @ eori.gg.uwyo.edu/news).

Our February workshop on "Polymer and Polymer-Gel Water Shut-off Treatments" held on the UW campus was a success. The presenters, Bob Sydansk and Randy Seright, put on an extremely informative program that engaged the participants in an animated "give and take" long after the presentation was over. Because this workshop topic seemed to be of strong interest to the producers in attendance, we are planning to present the workshop again in the Denver area in the fall. Keep watching for the scheduling of this future workshop on our website.



Coming up!

AAPG

Annual Meeting
June 19-22, 2005
Calgary, Canada
www.aapg.org

All-Alumni Cocktail Party



at the
AAPG Conference
Monday, June 20
5:30 to 7:30 PM
The Headquarters Hotel
Hyatt Regency, Calgary

GSA

2005 Annual Meeting & Exhibition
Geoscience in a Changing World
October 16-19
Salt Lake City, Utah
www.geosociety.org

AGU

2005 Fall Meeting
December
San Francisco, California
www.agu.org

ROCKY MOUNTAIN RENDEZVOUS

Fall 2005
(watch for specific dates on Website)
aapg.gg.uwyo.edu/rockymtnrendezvous

Rocky
Mountain
Geology

Visit us on the Web at:
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Or e-mail us at: editor@gg.uwyo.edu



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UNIVERSITY OF WYOMING
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DEPT. 3006
1000 E. UNIVERSITY AVE.
LARAMIE, WYOMING 82071 - 2000

307.766.3386
307.766.6679 FAX

[HTTP://HOME.GG.UWYO.EDU](http://home.gg.uwyo.edu)

JAMES I. DREVER
DEPARTMENT HEAD
DREVER@UWYO.EDU

BRENDON ORR
EDITOR

EDITOR@GG.UWYO.EDU

Persons seeking admission, employment, or access to programs of the University of Wyoming shall be considered without regard to race, color, religion, sex, national origin, disability, age, veteran status, sexual orientation, or political belief.



Undergraduate student Jeremy Tritchler examining rocks from the Paleozoic-Mesozoic section exposed in Centennial Valley during the Summer Geology Field Camp, 2004.

UNIVERSITY OF WYOMING

Department of Geology and Geophysics
Dept. 3006
1000 E. University Avenue
Laramie, Wyoming 82071 - 2000

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