Geosciences, GIS, and the “Second Age of Discovery” or “GIS@OSU”

By Dawn Wright

In a 1998 *New York Times* article, John Tierney introduced the interesting term “explornography,” which he defined as “the vicarious thrill of exploring when there is nothing left to explore.” His discussion of the term was actually meant to be a critique of the Peary expedition to the North Pole and of some forms of extreme tourism to exotic or dangerous places. And yet exploration of our planet through scientific fieldwork is still ongoing, but so also is the exploration of environmental databases, even of information spaces that do not necessarily include spatial data. Therefore, “exploration” and “discovery” have taken on new meanings. We are now in what many call a “second age of discovery,” where virtual worlds of real and imagined phenomena may be explored through computers on a desktop, in large visualization theaters, in small handheld devices or soon even through small devices on our clothing or eyewear. Web sites and applications such as Google Maps, Google Earth, and Microsoft Virtual Earth have become a critical part of daily life in modern society (the “next utility” as it were) for navigating to places of work, pleasure, and commerce, and engaging citizens in increasing their knowledge of the world. All of these are a variation on geographic information systems (GIS), which enable the spatial analysis, modeling and even simulation of Earth data, as well as just the simple viewing of it. GIS has become pervasive throughout the scientific community, natural resource management, government, industry, and business. Even small advances in geographic information science are having broad effects in improving day-to-day tasks throughout all sectors of society, allowing us to provide detailed planning for efficient and environmentally sound land development and management; map the migrations and territories of endangered animal and plant species; track depletion and recovery patterns of fisheries, forests, soil erosion; interpret the geomorphology of landscapes and seascapes, and much more.

In the Department of Geosciences, GIS activities span both Geography and Geology programs, involving research, teaching, and the development of GIS software applications. However, this is not limited to Geosciences as faculty members and research assistants from 17 departments and units across campus as well as 13 OSU labs, programs, and centers throughout the state, are involved in some aspect of GIS research, education, or provision of data and mapping services. OSU therefore continues to have one of the most active GIS programs in the Pacific Northwest.

To cite some Geosciences examples of GIS research, Dr. Dawn Wright and students in her Davey Jones Locker Marine/Coastal GIS lab have been engaged in a number of GIS projects to process, produce, and geomorphically characterize the seafloor based on multibeam bathymetry, sidescan sonar, towed camera imagery, and submersible observations (Figure 1). In addition, Wright and colleagues from the Danish Hydraulic Institute-Water & Environment, Duke University, and the Environmental Systems Research Institute (ESRI) have recently developed the Arc Marine data model for structuring and managing many forms of ocean and coastal GIS data, which to date has been downloaded 5000 times worldwide and is now in full adoption by the Marine Institute of Ireland (Ireland’s equivalent of NOAA), as well as the USGS Woods Hole Research Center.
Figure 1. Bathymetric map of the Eastern Samoa volcanic province, American Samoa, created in GIS by Jed Roberts ’07, formerly a geography graduate student in the Davey Jones Locker Marine/Coastal GIS lab, now a Geospatial Data Coordinator for the Oregon Dept. of Geology and Mineral Industries (DOGAMI) in Portland. Jed’s M.S. thesis compiled multibeam bathymetry datasets collected by various primary sources over the last two and half decades and then employed quantitative spatial analysis in GIS to assess the geomorphologic implications of shape parameter relationships.

Dr. Wright also has a new licensing agreement and partnership with Google that allows it to incorporate bathymetric data from her lab into Google Earth 5 (aka Google Ocean) and pledges technical assistance in the creation of effective KML files from the data. See the Davey Jones Locker web site at http://dusk.geo.orst.edu/djl for more information.

Figure 2. Map of precipitation levels in the U.S. for the month of August 2009 as generated by PRISM, courtesy of the PRISM Climate Group, OSU, prism.oregonstate.edu.

Dr. Chris Daly is the developer of the PRISM Parameter-elevation Regressions on Independent Slopes Model (PRISM) a climate mapping system that uses GIS point data and digital elevation models to generate gridded estimates and associated maps of monthly, yearly, and event-based climatic parameters (Figure 2). PRISM data sets are officially adopted by the USDA and recognized worldwide as the highest-quality spatial climate data sets currently available. The PRISM model and associated data sets were recently incorporated into the U.S Congressional Budget Office Report of Potential Impacts of Climate Change in the US. More information about Dr. Daly’s work and research group can be found at http://prism.oregonstate.edu/.

Dr. Stephen Lancaster and his students use GIS to interpret the causes of long-term and geographically distributed changes in the form of large rivers, as well as the role of debris flow in shaping mountainous terrain. He is one of the co-authors of the widely-used Channel-Hillslope Integrated Landscape Development (CHILD) model, a C++ program which incorporates GIS data structures as it
simulates erosion, sedimentation, and landscape evolution, over either geologic or "human" time scales. He is currently using the CHILD model along with GIS data to examine the effects of forest practices on debris flows and sediment transport, particularly in fish-bearing streams, and to find the sensitivities of valley morphology to stream bank and stream bed material properties. View Dr. Lancaster's web site at http://www.geo.oregonstate.edu/~lancasts/.

Even in a recession the U.S. Department of Labor lists the application of advanced geospatial technologies such as GIS as one of the fastest growing technology industries within our economy, along with nanotechnology and biotechnology. The Department of Labor's Occupational Outlook Handbook still projects that employment in the GIS, cartography, and remote sensing fields is expected to grow between 9 and 14% through 2014, and notes further that: "Areas such as urban planning, emergency preparedness, and natural resource exploration and mapping also should provide employment growth, particularly with regard to producing maps for the management of emergencies and updating maps with the newly available technology." Hence as the popularity of GIS technology has grown dramatically, so has the demand for those with a range of GIS skills, from basic proficiency to advanced GIS specialists.

To help meet this need, OSU Geosciences continues to coordinate and lead the certificate program geographic information science (i.e., GIS, remote sensing, and cartography), which offers a 27-credit certificate to undergraduates and a 19-credit certificate graduate students. Students in any major, any degree program may participate, given good academic standing and appropriate background coursework. The certificate program depends heavily upon the high-quality GIS courses offered by Geosciences instructors Dr. Dawn Wright and Ms. Laurie Becker, who offer introductory, intermediate, and advanced GIS, as well as Dr. Jon Kimerling and Mr. Mark Meyers, who offer related courses in cartography and map and image interpretation. Dr. Anne Nolin provides related curricula in remote sensing and digital image processing. In addition, all courses count toward the credential known as GISP (Certified GIS Professional) as administered by the GIS Certification Institute (http://www.gisci.org), which has certified over 1,400 GIS professionals since 2004.

In terms of numbers, the certificate program continues to be successful, with 29 students currently working toward the graduate certificate (8 certificates completed in the last year), and 25 students currently working toward the undergraduate certificate (16 certificates just completed). In addition, we will be embarking on a new option for the graduate certificate this academic year, thanks to a $111,000 Extend Campus development grant secured by Drs. Kaplan Yalcin and Dawn Wright. The new option is for those seeking to obtain our 19-credit graduate certificate without already being in a full-time, degree-seeking graduate program here at OSU. The option is therefore aimed at off-campus, in-career working professionals, or other kinds of continuing-education students seeking to enhance and expand existing skills, or help retool for a completely new career that involves working with GIS, remote sensing, or other geographic technologies. Visit the certificate program web site at http://geo.oregonstate.edu/gcert.

Dr. Wright has also been working with geography professors David DiBiase at Penn State University, Francis Harvey at the University of Minnesota, and Michael Solem of the Association of American Geographers (AAG) on developing a new graduate seminar to rigorously explore the ethical implications of GIS (e.g., the use of GIS for surveillance or terrorism, the lack of privacy introduced by mobile mapping devices, and use or misuse of GIS for conservation and sustainability, and more). The new course "Responsible GIS Practice: Ethics for Future Geospatial Professionals" will become a permanent offering at OSU next year via the OSU Extended Campus (distance education). (http://dusk.geo.orst.edu/ethics)

OSU Geosciences recently submitted a successful proposal to ESRI for the OSU campus to be among the inaugural group of "ESRI Development Centers" (EDCs). This new program provides recognition and special status to university departments that have exemplary programs focused on educating students to design and develop GIS applications using ESRI's ArcGIS desktop or server technology. This special designation adds more server technology products, licenses, and trainings to OSU's regular site license, and is a hopeful springboard toward establishing a campus wide data coordination center or GIScience center of excellence.

The department has been involved in a number of GIS outreach events as well, chief among them GIS Day, a global event with the goal of educating millions of children and adults about how geography makes a difference in our lives through GIS. On this special day, more than 2,000 schools and organizations host GIS Day events in 90 countries all over the world. Each year the Department of Geosciences has teamed with the Department of...
Forest Ecosystems & Society (in conjunction with the USDA Forest Service and the USGS), and the OSU Valley Library to involve as many as 400 middle and high school students from Corvallis, Beaverton and Portland in GPS scavenger hunts, presentations, lab tours, GIS demos, and map galleries on this special day (Figure 3). This year’s GIS Day event will be a 10th anniversary celebration for the campus, featuring a catered lunch hosted by Geosciences and the College of Forestry and a special keynote speaker from the Google Earth team. Past GIS Day events have been covered in the Corvallis Gazette-Times and in ESRI news publications.

Hence it is a great opportunity to recruit new students or to enjoy reunions with alumni who stop by the OSU table (Figure 4).

Figure 3. Above: Excited Corvallis middle schoolers disembark the bus at the LaSells-Stewart Center in anticipation of GIS Day events for the day. Below: OSU Geosciences grad students led groups of middle and high school on GPS scavenger hunts around Reser Stadium.

OSU Geosciences is also annually represented at the ESRI Academic GIS Program Fair during the world’s largest GIS conference in San Diego (the ESRI International User Conference with 14,000 attendees). This event gives conference attendees an opportunity to learn about higher education GIS programs and to talk with campus representatives.

Faculty and students in the Department of Geosciences play a key role in the application and development for GIS for a range of research projects, as well as community outreach and societal benefits. We are hopeful that as work continues in these areas, and collaborations and funding levels remain at least at the present levels, the future appears bright for a new kind of exploration and discovery (even productive re-discovery) of physical places, environmental databases, and the like through GIS. Please visit or bookmark our “GIS@OSU” web site at http://geo.oregonstate.edu/ucgis to keep abreast of all the latest developments on the GIS campus.
It’s an exciting and challenging time to be taking over as Chair of the department.

My first act in my first letter to you, our alums and supporters, is to thank my two predecessors – Jon Kimerling and Roger Nielsen – for their service to the department and to our community. (Actually, in our first faculty meeting, my first act after thanking them was to apologize to each of them - seeing the view from the Chair’s seat makes one realize how one might have been a better faculty member…)

Jon and Roger leave a department in solid shape to weather the winds of change that are blowing across our campus. Many of you have heard of the impact of the economic crisis on the state’s coffers and on the University. As a result, there is a flurry of activity on campus to focus on what we do well while working more efficiently. A central effort to accomplish this is a major restructuring of the university, within which Geosciences is poised to play a central role. The university’s “signature themes” include “healthy planet” (along with healthy people and healthy economy), where we, of course, are central - we are the planet. We’re also combining the Colleges of Science with those of Liberal Arts and of Education into a new Division of Arts and Sciences. Here, too, our centrality will position us to thrive, given our warm relations with many units across the Division and across campus.

Throughout all of this, there’s a huge amount to be proud of; below is a partial list for Geosciences: Melinda Peterson, the heart and soul of the department (“Office Manager” is her official title) was awarded the College of Science Valley Award for Exemplary Administrative Support. At the same ceremony, Ed Brook was awarded the CoS Harris Award in Basic Research (the second year in a row Geo took this). The following month, at the Geological Society of America meeting in Portland in October, Anita Grunder was named by the Association for Women Geoscientists (AWG) as Outstanding Educator of the year! Lucian Farmer won the B.S. poster competition at the AAPG-SEG expo held recently for his undergraduate research project with Andrew Meigs and Adam Kent.

Michael Campana, a new addition to the department fresh off five years directing the Institute of Water and Watersheds, was elected President-Elect of the American Water Resources Association, effective in January. He is also the 2009 recipient of AWRA's Icko Iben Award, awarded to a person who has made outstanding contributions to the promotion of communications among the various disciplines of water resources.

Our research thrives at all levels as well. Roy Haggerty finalized a new grant on A Metabolically Active Transient Storage Model for Predicting Nutrient Retention in Streams. The project has collaborators here, at ASU, and in Spain. Anne Nolin received two grants: one from NSF on "Climatic and Geomorphic Triggers of Cascadian Periglacial Debris Flows" (a 3-year project; Stephen Lancaster and Gordon Grant are Co-I's) and one from NASA on "Improving Water Quality Management: Use of Earth Observations in SPARROW" (a 4-year project; she's a Co-I and Molly Macauley of RFF, Inc. is the PI).

Ed Brook was awarded two grants: "Applications of Advanced Laser Spectroscopy to the Ice Core Record of Changes in Climate and Methane Biogeochemistry" -- Manish Gupta in Chemistry is a co-PI -- and "Atmospheric CO2 and Abrupt Climate Change." This will be funded to Jinho Ahn (research faculty) and Andreas Schmittner in COAS. Also, over the summer Ed hosted the IPICS Workshop on Science and Technology for the Next Generation of International Ice Coring in Corvallis (we had about 40 people from around the world here for this meeting; NSF paid for it). Hannah Gosnell also got news of a major grant, a three year study from USDA on payments for ecosystem services. With co-PIs Weng-Keen Wong (Computer Science, lead PI) and Matt Betts (Forest Ecosystems and Society, co-PI), Julia Jones is co-PI on a major NSF grant awarded last week: CDI-Type I: Novel machine learning models for predicting species distributions in response to climate change.

Recognition also continues well beyond the august walls of OSU. Dawn Wright was appointed to the National Research Council Committee on an Ocean Infrastructure Strategy for U.S. Ocean Research in
Anne Nolin has been selected as this year's Landolt Chair for a Sustainable Future at the Ecole Polytechnique Federale de Lausanne.

Michael Campana was appointed to serve on the NRC's Committee to Evaluate the Cycle 3 Plans of the USGS's National Water Quality Assessment (NAWQA) program.

John Dilles organized the hugely successful Condon Lecture, Nobel Laureate Dr. Susan Solomon gave two lectures on Oct 14 & 15--the talk on Climate Change was held in the large Austin Auditorium; more than 400 people attended the lecture. Susan's second (George Moore) lecture on the Antarctic Ozone hole was held in Gilfillan Auditorium and attracted more than 100 people. There was lots of good coverage and feedback.

And we even managed to have some fun! I counted about 40 alums plus pretty much all the geology faculty plus our Board of Advisors at an alum gathering at the national GSA meeting in Portland! Thanks and congrats to all who worked on putting this together, especially Shan and Ed, and to all who contributed to its success (especially our Board of Advisors, where heavy suspicion falls on how our “cash bar” suddenly became an open bar...). On other fronts, the 111th (!) annual apple-squeezing at Anita and John's was, but all accounts, a resounding success, with cider and good times for all. At our fall picnic, the faculty extended its unbeaten record in kickball into its 87th straight year by trouncing the students 182 to 2 (anyone with problems in the accuracy of these reports will need to get their own newsletter...). As ever, we owe a huge debt to Melinda, Stacey, Marion, and Kathy for pulling it all together!

Oh, and the Geoclub went to Israel and Palestine (more on that elsewhere)...

If you got this far, you'll see that we continue to do more with less. The department is a joy, but we always need help, especially to enhance the student experience. All the things that you may remember fondly - field camp, student trips, guest speakers and social events, for example - or that helped get you through school - especially the grants and professional travel opportunities - take resources. In these troubled times, we know that belts are tightening everywhere. But if you are in a position to help, a little bit goes an awfully long way. If you'd like to discuss opportunities or special interests you may have in the department, please do feel free to let us know.

In the meantime, excelsior!

Best to all,
Aaron Wolf
Professor and Chair

Geosciences Board of Advisors
November 2009 Update
by Brian Butler, Board of Advisors Chair

Greetings from your Geosciences Board of Advisors, which entered its 9th year of support of the Department in 2009. Twice a year, this all-volunteer group of Geosciences alumni and friends meets at the Department to discuss a wide range of issues that affect the Department, and provide advice to the faculty, staff, and students on subjects within the Board's collective expertise. Our overarching goals are to support the efforts of the faculty in continuously improving the Geosciences Department and to provide students with exposure to professional opportunities and insights.

The sustained downward trend in University resources around the nation brings new meaning to the historic proverb “...may you live in interesting times...” While the University, College of Science, and Department of Geosciences have had more than their share of interesting times in the past year, exciting research and inspiring teaching continued unabated in the Department. Congratulations to the students, faculty and staff for your impressive accomplishments and success in overcoming such challenging circumstances.

Transition of Department Chairmanship
The Board is grateful to Prof. Jon Kimerling, who stepped forward to serve as interim Department Chair in 2008 and 2009 before his retirement in July 2009. The current Chair, Professor Aaron Wolf, started as the Department Chairman in September 2009. Aaron met with us in Portland during the October 2009 BoA meeting, and we agreed on our goals and priorities for the coming year.

2009 Geological Society of America Meeting
The Annual GSA meeting was held at the Portland Convention Center in October 2009, with significant participation by students, faculty, and Department alumni. One of the BoA's members, Dr. Vicki
McConnell, Oregon State Geologist, served as the local committee chair for the GSA meeting.

Outreach to Department Alumni
With communication to Alumni being a continuing priority for the Board of Advisors, we were inspired by the October Geological Society of America Meeting to help the Department plan an Alumni gathering. The Board worked with the Department to update the Department’s alumni address list and plan the OSU Geosciences Alumni Reception gathering at the historic Ecotrust Building in downtown Portland. At the Alumni gathering on Monday night October 19th, we enjoyed the chance to visit with alumni, faculty, and students. Department Chairman Aaron Wolf welcomed the crowd, highlighted the range of exciting research at the Department, and encouraged alumni to stay in contact with the Department. We encourage you to send address updates to the Department so mailing and period email information can reach you. Additionally, we ask you to check out the department website! Faculty and student research is listed, along with alumni news and latest developments. For example, the Department’s distance learning program is expanding. What would you like to see in OSU Geosciences that is missing? Let us know!

University Organization
During the October 2009 meeting, the Board was briefed on proposed re-alignment of University colleges and departments. This realignment follows the vision of the OSU Phase II Strategic Plan, which identifies three Signature Areas of Distinction. The Strategic plan is available on the OSU website at: http://oregonstate.edu/leadership/strategicplan/. These areas of distinction “orbit” around an educational core that contains much of the College of Science, including Geosciences. The re-alignment will serve both the Phase II strategic vision, and improve University cost effectiveness at a time when University resources are stretched thin. The Board recognizes that the University realignment is being considered at the highest levels. Accordingly, while we will likely not suggest modifications to the plan, the Board will continue to help the Department adapt and implement these organizational changes to best meet the Department’s educational and research goals. We will distribute additional information when it is known.

BoA Membership
As you might expect, the Board of Advisor membership is professionally and geographically diverse. Board members bring a broad range of professional and business experience in government, industry, academic, non-profit, and consulting, which provides an independent perspective on current and emerging issues. Our representation spans from the US coasts to the heartland including Oregon, Texas, Colorado, New York, Idaho, Washington D.C., and Washington (State). During the last academic year, several Board members concluded their participation, including Dick Marston, Xan Augerot, and Steven Anderson. We appreciated their contribution and participation. This year we welcomed new members, Prof. Jerry Griffith (University of Southern Mississippi), and Lt. Col. Wiley Thompson, Ph.D. (USMA). We appreciate the commitment that brings members to participate in our bi-annual meetings.

We invite you to contact the Board of Advisors and Department with your ideas, suggestions, offers of support, and questions. Please contact me, any of the Board members, or Prof. Aaron Wolf, the Department of Geosciences Chair if you are interested in participating on the Board of Advisors. As any of us can attest, your contributions and opinions make a difference. Our email and mailing addresses are available on the Department of Geosciences website under the “Alumni & Philanthropy” heading.

Geosciences Club Field Trip to Israel by Una Monaghan

The 2009 Israel-Palestine spring break trip was replete with regional geography, geology, water policy, science and religion. Led by Dr. Aaron Wolf, S. Mark Meyers, and Gregg Walker, a group of students from OSU flew to Israel and Palestine to embark on a journey of inspiration and intrigue.

The first morning brought us to the ancient port city of Jaffa, near Tel Aviv, before travelling north to the coastal nature reserve of Dor HaBonim. There, we observed the kurkar ridges, natural shell bays and sandy beaches. Continuing northward along the
Mediterranean coast, our subsequent stop was at the National Institute of Oceanography (NIO) in Haifa. Our group visited the aquariums to observe the many species of coral propagated there for reef rehabilitation. We learned about the various other research affiliated with NIO, such as: the influence of desalination plants on marine environments; the impacts of global climate change on local biodiversity; infrastructure for ocean and marine data management; geophysical imaging of regionally active faults and coastal sediment anomalies. We visited the Baha’i World Center on the tiered slopes of Mount Carmel in Haifa. We heard the interesting tale of Haifa’s history, as it was conquered and ruled by the Byzantines, Arabs, Crusaders, Ottomans, Egyptians and the British, before the establishment of the State of Israel in 1948. Today, Haifa is a major seaport with high tech industries, steel, chemicals, textiles and a petroleum refinery. That evening our group watched the sunset over the northern borders of Lebanon and Syria from Tel Hai, the “Mountain of Life.”

The following day began with rain falling on the basalt landscapes of the Golan Heights. This montane region forms a plateau that drops westward toward the Jordan River and the Sea of Galilee. The group purchased national park passes to enter Israeli heritage sites, starting with the Hermon Stream Nature Reserve, site of the Banias Springs and the headwaters of the Jordan River. The park also featured the remnants of a pantheon temple to the god, Pan. The cold water of the Hermon Stream emerges as springs at the base of the temple and flows into large pools. The water continues through a steep canyon, and the sheer gradient allows for cascades and waterfalls before the stream flows out to the Hula valley, situated along the Syrian-African Rift (Dead Sea plate-boundary).

The Hula Lake restoration area, the next stop on our tour of the region, is an endeavor to restore eroded peat lands. Networks of canals have been dug to control the height of the water table in the valley, and the nearby exhumed Lake Agamon. The area is now a sanctuary for migrating cranes, ibis, pelicans, black stork, waterfowl and water buffalo. The management of this area is interlinked to the Kinneret Limnological Laboratory on the shore of the Sea of Galilee. We were joined by hydrogeologist Haim Michelson, who taught us about the Sea of Galilee and how it divides two Neogene basins. These basins are characterized by largely continental clastic sequences and basalt flows. We continued south toward the Yarmouk River, which is a main tributary to the Jordan River, as well as a border between Israel, the Hashemite Kingdom of Jordan, and a small portion of Syria. We visited Bet Sh’ean National Park, also known as Nyssa Scythopolis, archaeologists uncovered the monumental center of this Roman, and later Muslim city which in 749 CE fell ruin to at least one earthquake. From fields of wildflowers, our group identified the Golan Iris as the national flower of Israel and then we continued south.

With some transition, we travelled into the West Bank and were hosted by Al-Quds University. Our experience in the West Bank had major highlights, such as the modern day village of Sebastiya and an archaeology site therein, steep sandy hikes to an unusual Greek monastery in the Wadi Al-Qilt, great conversations with Palestinian people, tracing the ruins of Jericho, a visit from the governor, and an open fire dinner with traditional dancing and music. Beyond this guarded experience we were allowed in the West Bank, there are some serious issues at hand within these borders, such as, drinking water access. We listened sensitively to the Palestinian positions on many complex and controversial issues, and learned some of the profound impacts of water scarcity on Palestinian society. We witnessed the regression that is signature between the zeal for security and the desire for freedom.

OSU Students Trent Brickey, Tiffany Townsend, Erin Wells, Sara Alsbury, Ana Lu Fonseca and Palestinian students from Al-Quds University lead a hike along the Wadi-Al-Qilt through the mountain way in the district of Jerusalem. Passing the Al Fawaar springs and stopping at the Saint Jarojues monastery, the field trip exits in Jericho, the city of the moon (Photo by Sarah Sheldrick, 2009)

After leaving Palestine, we reunited with our friend and bus driver, Meir, and journeyed south down the rift valley to spend the evening at the Ein Gedi Oasis. The following morning we hiked up Mt. Masada for the sunrise. The ancient palace atop the mountain overlooks the Judean Desert to the west and the Mountains of Moab to the east. We then went to the
exotic and well-tended Ein Gedi botanical garden, where gardeners cultivate more than 800 species of trees, plants, shrubs and flowers, including Baobab and Frankincense trees. In the afternoon, our group got to experience the legendary therapeutic effects of the mud and minerals of the Dead Sea.

The following day, we were guided around the Dead Sea by Dr. Clive Lipchin, a researcher from the Arava Institute for Environmental Studies. We walked along a sequence of reactive sinkholes that have formed on the west shore of the north basin of the Dead Sea; these have formed for an array of reasons, however, the underpinning driver is the diversion of water for national development. The negative water balance of this changing sea is part of the current deliberation for the Red Sea-Dead Sea Canal (RSDSC). Theoretically the RSDSC “Peace Conduit” would channel marine water from the Gulf of Eilat, desalinate it to provide drinking water for the people of the Jordan River Valley area, and contribute the brine water to the restoration of Dead Sea level. We are thankful to people like Dr Lipchin, Friends of the Earth Middle East (FoEME), and scientists at the Zuckerberg Institute for Water Research who took time to share their work as they seek to ameliorate the array of environmental conditions that at this time exist.

We drove through the rocky and sparsely populated Negev Desert to our destination, Mitzpe Ramon, a little desert village overlooking Makhtesh Ramon, a 40km by 9km amphitheater, carved with the ubiquitous forces of erosion and cutting into the Ramon Ridge anticline, the earliest rocks here are Triassic. Human settlements and Kingdoms in these Negev Highlands go back to the dawn of history. In the 4th century BCE, Avdat (once a Nabatean settlement - now a national park) was built as a way-station along the “Spice Route” from the Orient and the Arabian Peninsula. Here we learned how they once cultivated plants and raised sheep; this was made possible by channeling rainwater into plastered cisterns. So resource-conservative was this large settlement that they placed smooth boulders into the canal systems to harvest runoff dew.

The closing stage of our travels brought us to the ancient city of Jerusalem. Situated in the heart of the Judean Mountains, Jerusalem is built on a hilltop and its walls rest on dry riverbeds and ridges. The city began on the hill named ‘City of David,’ and extended north to envelop the Temple Mount, and later toward Mount Zion. Jerusalem lies within the Kidron Valley drainage basin, and the alignment of the city has been influenced by the course of the Kidron River and other streams. With excellent guides, we found the city to be charged with myth, saga, miracles, silence, destruction, restoration and hope. After a few days, our group departed from Ben Gurion International airport having observed a high standard of applied science, the water allocation of Israel as governed by Mekorot, some conceptual differences between neighboring riparian identities, and with new-gained insight into the spiritual bedrock of millions.

Alumni News

Duane Nellis (PhD Geography 1980). July 1, 2009, Duane Nellis was named president of the University of Idaho. He served as Kansas State University’s provost and senior vice president since 2004. He previously served as dean of the Eberly College of Arts and Sciences at West Virginia University. Duane also spent 17 years at Kansas State, progressing from assistant professor of geography to professor and head of the department, and then to senior associate dean of Kansas State’s College of Arts and Sciences. Duane is a native of the Northwest. He was born in Spokane, Wash. He met and married his wife, Ruthie, while pursuing his bachelor’s degree in geography at Montana State University. He received his master’s and doctoral degrees in geography at Oregon State University.

The newly announced president of the University of Idaho, Duane Nellis, answers questions in the Administration Auditorium Wednesday morning as his wife, Ruthie Nellis, sits behind him.

Christian Lewallen (BS Geology 2008). I have just accepted a position at an environmental consulting firm (Freestone Environmental Services) in Richland WA. As a geologist, I’ll be mainly performing well-site geology, soil and water testing/sampling, and well installation at the Hanford site and region. Freestone is a smaller firm, but established and will be a wonderful place to start my career. I would like to thank all of the professors, TA’s, staff and anyone else who helped me achieve my goals. OSU has an outstanding Geoscience department and I couldn’t be prouder to hold a degree from it! Thanks again to everyone and hope to run into you in the future.

Pat Tolson (MS Geology 1976). My wife Robin and I recently moved from an idyllic 5 acre property with pond, pool, barn and way too many other things to keep up with to a new house with one low maintenance acre. After working with Dominion Resources for 4 years in the Mid Continent and Rockies, those properties were divested. I had great timing and was able to get back on with Marathon Oil (Sept 2007) in a very small Oklahoma City office (now up to 5 geologists/1 geophysicist). I started working exploration in the deep Oklahoma Anadarko basin but have recently switched to chasing Devonian Woodford shale gas opportunities across our extensive lease holdings in the greater Anadarko basin including the Texas Panhandle.

Tom Henricksen (PhD Geology 1974). I am working part-time in Peru and South America and part-time in eastern Europe... That is a combination! Still working as a consultant geologist looking for and developing early stage exploration programs for gold-silver and base metals.

Beth Lambert (MS Geography 1998). I’m a fluvial geomorphologist working for the Commonwealth of Massachusetts in the Division of Ecological Restoration. I lead a small program (3 full-time staff) dedicated to river restoration, primarily dam removal. We have removed 7 dams so far and have more than 25 projects in the planning stages. I love it! After moving from Oregon back to the east coast in 2005, I also spent time working on salt marsh restoration projects -- in fact, I met my husband while collecting vegetation data on a restored marsh. We married last fall and live in a small classic New England town north of Boston.

Randy McKinley (MS Geography 1979). Geographer, employed by the U.S. Geological Survey. From his offsite office in Sheridan, Wyoming, Randy provides remote sensing support to USGS EROS located in Sioux Falls, SD. His current duties include mapping wildfires in support of Department of Interior Burned Area Emergency Response (BAER) teams, using remote sensing and GIS technologies to monitor post wildfire rehabilitation and recovery, and other technical and project management activities. (2008). Randy has two daughters, Sheridan (12) and Kaylin (10), that keep him very busy when he's not riding horses and packing mules in the Cloud Peak Wilderness, fly fishing the Bighorn River, or working on home/barn improvement projects.
Alexander Schriener, Jr. (MS Geology 1978). In March of 2009 accepted a position as Director of Geothermal Resources for CalEnergy Operating Corporation, Calipatria, Calif. This is similar to a position held with the same firm from 1996-2001. It involves directing drilling, geology, reservoir engineering, geochemistry and geophysics for the 360 megawatt Salton Sea geothermal field; the largest liquid-dominated geothermal field in the US. The field is currently permitting a 195 gross megawatt expansion, so life is very busy. His wife Margie teaches twenty 3-year-olds at a preschool. Alex and Margie still live in Bermuda Dunes, Calif. Alex (27) and his wife Karina are proud parents of 2 ½ year old son and a 3 month old daughter. They live about 1 mile from us, so we are grandparents almost every weekend. Alex is still working to get accreditation to be a high school English teacher. Timothy (25) is a Research Assistant and a PhD student at the University of New Mexico in Nuclear Engineering. His research involves simulation modeling of new reactor designs. He graduated from OSU in 2006 with a BS degree in Nuclear Engineering.

Matt Nazar (MS Geography 1992). Matt is the Deputy Director of Development Services overseeing the city planning for Maine's Capital city, Augusta. After returning to New England in 1992, he worked as a local and regional planner in New Hampshire for seven years then moved back home to Maine. He worked for the Maine State Planning Office, finishing there as the Director of the Land Use Program for the state before returning to local planning in a rapidly changing city. He spends his free time renovating a 160 year old home that he enjoys with his wife and two daughters. They do as much skiing, hiking, biking, and exploring as they can.

Derik Kleibacker (MS Geology 2001). Moved from Anchorage in late 2008 with wife Annie and two sons, Miles (4) and Jules (2). Now working with ConocoPhillips Canada in Calgary as a regional Arctic exploration geologist.

Marvin Kilbourn (BS Geography 1995). I am working for MDA Federal (formerly Earthsat) as a Senior Geospatial Analyst in Rockville, Maryland. I am doing analysis and extraction with the most up-to-date software on the market. I really enjoy what I am doing since I left OSU with work in the Geospatial industry. I've been an active member of the American Society of Photogrammetry and Remote Sensing (ASPRS) since 1999. My wife, Lyn, and I have been married since 2000 and have a daughter Katherine and son Johnathon. I enjoy spending time with family and try to watch OSU football when I get the chance.

Terry Toedtemeier (BS Geology) He had just finished talking about the place that he loved so much, to rousing, hearty applause. Terry Toedtemeier, an influential photographer, curator, historian and scientist, died from heart-related complications. He was 61. Toedtemeier collapsed right after giving a lecture at Hood River's Columbia Center for the Arts. About 175 people had come to hear him and book publisher John Laursen talk about "Wild Beauty," the magnum opus they co-wrote on the history of the Columbia River Gorge and published through Oregon State University Press. Toedtemeier had battled an undiagnosed heart ailment for the past year, said his wife, Prudence Fenwick Roberts. "This is a huge loss for the artistic community of this city and the region," said Brian Ferriso, executive director of the Portland Art Museum where Toedtemeier had been photography curator since 1985. Born in 1947 in Portland, Terry Norman Toedtemeier studied geology at Oregon State University. So began a fascination with how the landscape of this time and place reveals the world's larger meanings.

James E. Day (BS Geology 1979). I am currently a professor of Geology at Illinois State University teaching Sedimentology, Stratigraphy, Invertebrate Paleontology, and Earth History. I am staying busy working on Devonian rocks in a number of western and central North American basins. Most of my work has and continues to focus on Middle and Upper Devonian brachiopod and conodont biostratigraphy, brachiopod systematics, Devonian sea level event history, and more recently paleoclimatology using stable isotopic and paleomagnetic proxies. After completing my B.S. in Geology at OSU, I headed to Northern Arizona University and completed an MS in Geology at Northern Arizona University, then went to the University of Iowa to do the Ph.D. finishing in 1988. I currently have three kids Jamie (14), Patrick
(11) and Molly (8) and wife Kathy (age to remain unknown). Keeping busy writing papers and canoeing local rivers when they are not flooding.

**Ryan Goodner-Belli (BS Geography 2006).** My application for the Master's Program in Geography at CSU Long Beach was accepted. I have been enrolled in my classes and I have a part job on campus for the time being. The focus of my Master's Degree is going to be Land Use and Regional Planning. This semester is easy - Advanced GIS, Qualitative GIS, and Land Use are the classes I'm taking and class is a two minute walk from work.

**Martin Hannigan (BS Geology 1995).** I went out to field Camp in 1997. I found some old photos on Facebook - put on there by another alum and friend of mine Bob Houston who studied with me during those years and attended the same camp. I doubt my old profs will believe it but I'm now a bank manager back home here in Belfast, Northern Ireland. Actually, come to think of it they may well believe it given the state of the world economy! I have one son named James who is almost 6 years old and am still married to Jennie who used to be a Prof in the English dept at OSU.

**Vernon McFadden (BS Geography 2002).** I've been up in Portland for the past 6 years (since graduating) and held various jobs. None longer than a year at a time due to medical issues. The most significant was a stint of two months as a volunteer GIS tech with the Portland office of USF&W. I was up for a paid position there, but didn't get it and was let go due to federal budget cuts. This seriously derailed my planned career as a GIS person, but I did manage to post a position as a Guest Services Attendant first for the Oregon Arena Corporation then Global Spectrum and now for AEG. I know it's not Geo-related, but it pays the bills. I plan on moving to California in October to pursue a continuing career with AEG on the side as well as two other possibilities. One being getting a GIS position in the LA area to work on the current and ever growing fire situation in the state. This is just in the idea stage for now. The other is pursuing an Accounting degree if that doesn't work out. I still remember my time at OSU and there are still quite a few people still there from when I was a student. I hope they still remember me...

![OSU team trenching a newly-discovered active fault southwest of Srinagar in Kashmir. Dave Trench (MS Geology 2008) on left in red coat, and Chris Madden. PhD candidate, next to him. Indian graduate student from Kashmir University on right. Backhoe operator is excavating a trench for paleoseismology. It began to snow on the first day of trenching.](image)

**Cheerful Givers**

The quest for academic excellence by the Department of Geology, University of Ibadan, Oyo State, Nigeria, received a boost on Wednesday, February 11, 2009, when some Chevron employees, including those who are alumni of the department, donated about 22 boxes of books and journals to the department.

Speaking at the presentation of the books, Femi Esan, Earth Scientist, Offshore Asset Team, said the idea for the donation was conceived out of his desire to give back to his alma mater. In his words: “The idea was to ask members of the Earth Science community in the company to donate books and journals from their personal collection to the geology department of the University of Ibadan.” This initiative was supported by a friend and fellow alumni of the Department.
Mr. Esan thanked Chevron Nigeria Limited for facilitating and paying for the transportation of journals donated by the family of the late Professor George Moore, from Oregon State University. He also thanked other Chevron employees who contributed to the book drive. They were; Tom Zalan, Bill Hallager, Brian Cerney (who donated many volumes of the Ocean Drilling Project, a landmark research resource), Peter Wilkinson, Haiqing Wu, and Oluseye Ekun. Others were; Adedoja Ojelabi, Iyabo Ogun, Clement Chukwuka, Tayo Magbagbeola and Ken Yeats, who facilitated the donation by the estate of the late Professor George Moore.

Sunday Okegbemiro, PGPA coordinator, Community Relations and National Programme, who represented Engineer Femi Odumabo, general manager, Policy, Government and Public Affairs, said it was a delight to witness the presentation of books donated by the employees and Professor Moore’s estate. He noted that the donation aligned with the company’s vision of promoting sustainable development in the society. Engineer Odumabo said Chevron strongly believed that education was key to unlocking the potential of the youth and developing their capacity for societal relevance. Engineer Odumabo explained that the donation was “made exclusively by our employees, led by the alumni of the University of Ibadan, in conjunction with the family of the late Professor George Moore, who donated the professor’s journals.”

In his response, Professor Agbaje, deputy vice chancellor (Academic), who represented the vice chancellor of the University of Ibadan, expressed the university’s appreciation for the donation. He said that it was part of a genuine contribution to the improvement of knowledge and skills in the sciences. He recalled the series of contributions in the past from Chevron, including desktop computers and books to the institution.

Ken Yeats, Earth Science Functional Mentor, Offshore Asset Team, said he was honored to present the books and journals, which includes 40 years of AAPG Bulletin, 50 years of GSA Bulletin, and 35 years of GSA Geology on behalf of the late Professor Moore and his family. Mr. Yeats advised the students to tap into the impressive and wide ranging careers of Professor Moore to great advantage by thinking and dreaming like him.

Adedoja Ojelabi, Earth Science Immersion Training coordinator, said the donation was a new partnership project the alumni were establishing with the department. She said the group intends to reach out to other colleagues outside Chevron to create a world-class research library for the department.

**Status of Yeats Professorship**

You may be wondering about where the Department stands on the Yeats Professorship, to which many of you have contributed. The focus of the new position will be on earthquake geology as well as first principles of geology, including field geology.

As of August 31, 2009, the Yeats Professorship Fund had $342,772.73 in the bank and outstanding pledges of an additional $85,047.33 for a total of $427,820.06. Ryan Robinson of the OSU Foundation estimates that all the pledges will be paid within the next two years. We hope that with additional contributions, we will reach $500,000 within the same two years.

The Yeats Professorship campaign, the first one for an endowed position in Geosciences at OSU, has been affected by the downturn in the economy, which, as most of you know, has had a major effect on Oregon. Nonetheless, we are moving forward, and with future contributions comparable to those of the past two years, we should reach the $500,000 goal on schedule.

There is a difference between an *endowed professorship* and an *endowed chair*. An endowed chair requires donations totaling at least two million dollars. A professorship is reached at the half-million dollar level. If donations to the Yeats Professorship go up significantly to approach two million, the conversation changes dramatically, but still requires a hiring strategy session with the Dean. At $500,000, the hiring strategy involves combining the
endowment with State funds. It is for this reason that the state of the Oregon economy and the OSU budget are major factors. Having $500,000 in the bank certainly moves the Department closer to the front of the line in awarding a faculty position in earthquake geology.

We thank our alumni and departmental friends for their support of the Yeats Professorship. President Ed Ray, in his address to the Faculty Senate on the State of the University, outlined a plan for the year 2025 that envisions a student body of 35,000 supported by hundreds of new faculty. The externally-funded research budget has reached $500 million and is anticipated to reach $1 billion in the near future. The nationally-ranked programs in Geosciences are well situated in the OSU Master Plan to be part of this expansion, and the Yeats Professorship will add greatly to the growing stature of the Department. We hope you agree and will continue to support us as we move past the recession into a new growth period.

New Alumni, 2008-2009

Adams, Jeremy M., Geography, MS 08
Akers, Brant M., Geography, BS 09
Arnold, Taryn N., Geography, BS 08
Benfield, Dylan S., Geography, BS 09
Benge, Gregory N., Geography, BS 09
Berube, Matthew A., Geography, BS 09
Black, Brandi M., Geology, HBS 09
Bou-Rabee, Donna M., Geology, BS 09
Brown, Aimee, Geography, MS 09
Brown, Christopher M., Geography, BS 09
Burck, Conner, Geology, BS 08
Cottrell, John-Henry, Geology, BA 08
Cunningham, Jennifer L., Geology, HBS 09
Derschon, Andrew E., Geography, BS 09
Ersek, Vasilie, Geology, PhD 08
Grant, Jeffrey L., Geology, BS 09
Green, Joe W., Geography, BS 09
Hanson, Bradford W., Geography, BS 09
Hatfield, Ashley K., Geology, MS 09
Hulen, Eric A., Geology, BS 08
Iademarco, Mike, Geology, MS 09
Johnson, Ajeet K., Geology, BS 08
Jones, Travis S., Geology, BS 09
Killian, Brian J., Geology, BS 09
Kinzel, Michelle R., Geography, MS 09
Lee, Robert G., Geology, PhD 08
Lewallen, Christian D., Geology, BS 08
Lilja, Nicholas P., Earth Science, BS 08
Lovett, Andrew J., Geography, BS 09
McCune, Myrica M., Geography, BS 09
Monaghan, Winifred P., Geography, BA 09
Ndzeidze, Stephen K., Geography, MS 08
Novak, Anthony, Earth Science, BS 09
Ourada, Quin M., Geography, MS 09
Parker, Jessica R., Geology, BA 09
Parker, Lauren, Geography, MS 09
Rinehart, Ronald W., Geography, MS 08
Rogerson, Melody E., Earth Science, BS 09
Sande, Casey R., Earth Science, BS 09
Shew, Brenda M., Geology, BA 09
Summer, Kyle R., Geography, BS 09
Teal, Samantha K., Geography, BS 09
Thomas, Samuel, Geography, BS 09
Townsend, Tiffany N., Earth Science, BS 09
Tran, Katyna A., Geography, BS 09
Trench, David G., Geology, MS 08
Varnum, Casey N., Geology, BS 09
Waggoner, Scott, Geography, MS 09
Watson, Nathan Light, Geology, BS 09
Weidmann, Michael D., Geography, BS 09
Well, Erin E., Earth Science, BS 09

Awards to Geoscience students 2008-2009

UNDERGRADUATE AWARDS

Amanda Prewitt Award. Geosciences female sophomore or junior who has shown an enthusiasm for a career in the earth sciences: **Henri Mason**

Jess Johnson Student Writing Award. Geography undergraduate who has demonstrated excellence in the classroom and an aptitude for writing: **Myrica McCune**

Samuel M Evans Jr Memorial Award. Geology sophomore demonstrating excellence of scholarship and professional motivation: **Kevin Weldon**

Earl L Packard Achievement Award. Geology junior who is scholarly and professionally motivated: **Celene Christensen**

Award for Excellence in Geology. Outstanding graduating senior in geology: **Nathan Light**

Christian John Hunt Award. Geography undergraduate: **Ashlee Larkin, Emil Scown, Jennifer Bean, Kendall Rutter**

Richard Chambers Award. Support for an undergraduate research project in Geology or Earth Science: **Kiya Wilson, Celene Christensen, Lucian Farmer, Lauren Foiles**

Arthur Parenzin Undergraduate Scholarship. Support for a new incoming undergraduate student to study Geography at OSU: **Clara Mandujano**

Earth Science Excellence Award. **Kiya Wilson** Award for Outstanding Service to the Department. **Sara Alsbury**

GRADUATE AWARDS
Lance Forsythe Memorial Fellowship. Graduate student from Geology, Geography, or Marine Geology exhibiting breadth and independence of thought: Jeremy Shakun
Jess Johnson Student Writing Award. Geology graduate student who has demonstrated excellence in the classroom and an aptitude for writing: Julia Rosen, Aimee Brown
George & Danielle Sharp Fellowship. Graduate student in structural geology or sedimentary geology: Ajeet Johnson
Keith Muckleston Fellowship in Water Resources. Outstanding student in water resources: Lauren Parker
Highsmith Founders Fellowship. Jon Ellinger
Landau Associates Graduate Fellowship. Ajeet Johnson
Mundorf Fellowship. Amy Lange
Glassman Fellowship. Andrew Beedlow
Biogeography Award. Steven Highland
Outstanding Graduate Teaching Assistant Award - Geology. Erin Lieuallen
Outstanding Graduate Teaching Assistant Award - Geography. Isaac Daniel

CONGRATULATIONS

JULIA ROSEN, Geology doctoral student, will receive a nationally competitive 3-year NSF Graduate Fellowship.
TERRY FRUEH, Water Resources Engineering doctoral student, has been awarded $3,000 for his research by the Geological Society of America.
DYLAN KEON, Geography doctoral student, took first place at the Association of American Geographers (AAG) Annual Meeting in the Cyberinfrastructure Specialty Group (CIGG) Student Paper Competition.
JAY ZARNETSKIE, Water Resources and IGERT Ecosystem Informatics doctoral student, won the Outstanding Student Paper Award in Hydrology at the Fall Meeting of the American Geophysical Union.
ERIC SPROLES, Water Resources doctoral student, received an NSF Doctoral Dissertation Improvement Award for his project entitled “Modeling Basin Scale Snow Water Equivalent: Present Day and Projected Future Impacts on Stream Flow in the Oregon Cascades.
AIMEE BROWN, Geography masters student, was selected for a prestigious internship at the National Geographic in Washington, DC. She also was awarded a College of Science Student Travel Award (COSSTA) to aid her in presenting her research at the American Geophysical Union fall meeting in San Francisco.

JEFF PHILLIPPE, Geography masters student, was the 2008 recipient of the WAGS/UMI Distinguished Masters Thesis Award.
JENNIFER CUNNINGHAM, Geography BS recipient and currently an MS graduate student, has been named a 2009 DeLoach Scholar by the OSU University Honors College.

Joanne Marie Van Geest, 1943-2009

A woman of strength with a heart full of love, Joanne Van Geest passed away in January after fighting a battle with cancer.

Joanne grew up in Blodgett surrounded by her two sisters and three brothers. She developed a love for the outdoors that she never outgrew. As an adult, she spent many hours tending her garden and walking in the woods with a beagle companion. In 1970, she became the mother of a treasured little girl, Jennifer. A few years later Matthew, another great joy, was born. Joanne dedicated her life to caring for her family and for Matt’s special needs. In 1985, Matthew passed away as a result of Gaucher’s disease. Joanne was hired on October 20, 1986 as Departmental Secretary of Geography. In 1989, Geography and Geology merged to form the Department of Geosciences. Joanne eagerly took on the additional work created by the merge.

Joanne took great joy in her grandchildren and was thrilled to hear that a new baby was on its way. She fought hard to live until her new granddaughter arrived. Two weeks before she passed, little Parker was born and Joanne received her final wish.