

THE BUFFALO ROCK

The newsletter of the
Department of Geosciences,
North Dakota State University
Volume 15, December 2013

NOTES FROM THE CHAIR:

Greetings GeoAlums and Friends!

We're finishing off another productive year at NDSU Geosciences. It is a historic one as well, for Allan Ashworth will fully retire from teaching this month after many great years of service.

A job ad is posted for a "Sed/Strat/Paleo" faculty member to replace Ashworth – but Allan will be a tough act to follow. He leaves a legacy of terrific students (you!), outstanding research, and service to the university, community, state, and profession. We all are going to miss him.

We're now at 60 majors. Our classrooms in Stevens Hall, of course, cannot easily expand to accommodate this growth, and so faculty and students are daily practicing *stress/strain relationships* to make it all happen. More and more women are choosing to major in Geology here, with NDSU now approaching the national average of $\approx 42\%$ women. The booming oil/gas development in western North Dakota, of course, spurs interest in the profession. Most of our graduates elect to work in the oil patch for a few

years, many with the plan then to continue on to graduate studies.

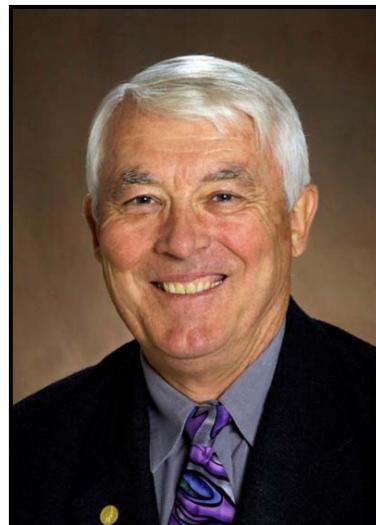
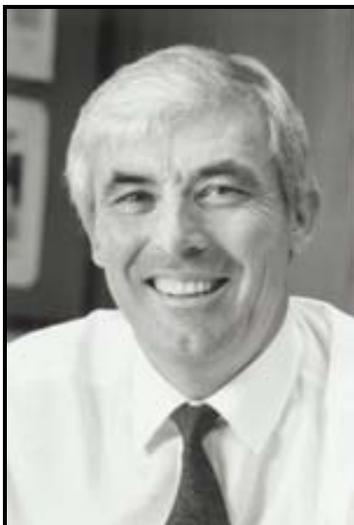
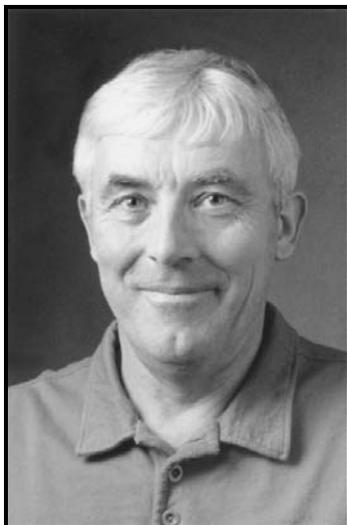
Thanks to the continued generosity of our alumni and friends, the GeoAlumni Endowment continues to grow, with 100% of the proceeds dedicated toward support of our undergraduates' scholarship and field training opportunities. The state of North Dakota might even provide a 1:2 match for pledges/donations to the endowment exceeding a certain threshold. If you are interested, please contact me.

What hasn't changed over the years is that we continue to produce *great* students, who continue on to become *great* professionals.

We always enjoy hearing from GeoAlums and hope you will drop a line, become a fan of the department's Facebook page, or stop by for a visit! On behalf of the students and faculty, thank you for your support – and best wishes for the New Year from all of us at NDSU Geosciences!

Don Schwert

SOME REFLECTIONS ON THE LIFE AND TIMES OF ALLAN ASHWORTH



On December 6th, Allan Ashworth finished teaching his last lecture class (Stratigraphy & Sedimentology). This coming May, Allan will officially retire, although he plans to keep his research program active. For all of us, an era is ending. We are grateful for Allan's years of service, and we wish Allan and Hazel well in retirement. The following are some reflections on the life and times of Allan Charles Ashworth.

Allan was born in Fischergate, Sussex, to Jim and Barbara Ashworth. It was 1944, Great Britain was at war, and Jim was in Egypt – having fought Rommel as part of the North African Campaign. Jim would not see his first-born until Allan was a toddler.

As a boy growing up in Sussex, in this spectacular setting between the sea and the downs, young Allan collected fossils from the Cretaceous chalks. His interests in geology and paleontology were spurred on by his school science teacher, Mr. Allchin, who would take Allan and the other boys on long bike rides into the countryside to view geology and to collect fossils.

The Headmaster for the High School for Boys in Worthing wrote of Allan, "*Ashworth is an excellent boy in every way. He has good academic ability . . . he is a good cricketer, and a good soccer player.*"

Being athletic and enamored by soccer (err, "football"), Allan considered going professional.

But fortunately (for us!), his science teacher's (Mr. Allchin's) influence won . . . as Allan's love of geology took center place. Allan entered the University of Birmingham, where he excelled in geology and later became president of the university's Lapsworth Geological Society.

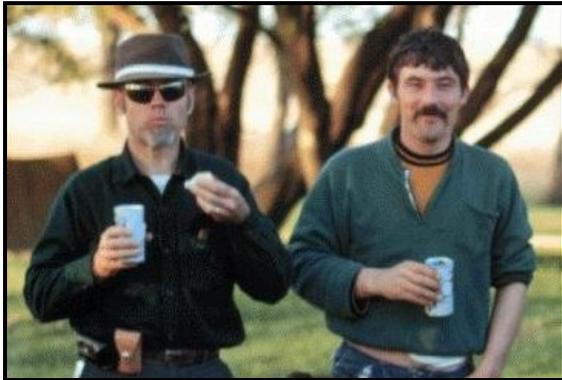
Along with his fellow students in geology, Allan sailed the rocky seas of a science that in the mid-1960's was undergoing changes of tectonic (or should I say, "plate tectonic") magnitude.

It was in 1964 at Birmingham that Allan met a beautiful woman by the name of Hazel Heward. Hazel was then working at the University of Birmingham for the Clerk of the Guild of Undergraduates. They fell in love and married in 1966.

It was also in 1966 that Allan graduated from the University of Birmingham. Allan was then accepted for graduate studies at Birmingham, under the supervision of a truly remarkable geologist: G. Russell Coope. It was Coope who had recognized that bits of insects preserved in peats could themselves provide a fascinating story of past climatic and environmental change. Under Coope's guidance, Allan entered into this new and exciting science.

As Allan was finishing up his graduate studies, NDSU Geology professor John Brophy arrived at Birmingham to spend his sabbatical learning the art of Quaternary paleontology

from Coope. It was here that John met young Ashworth. As Allan was completing his dissertation, he received an invitation from Brophy to come to the U.S. to teach at NDSU.



John Brophy and Allan Ashworth, relaxing at the end of a Black Hills field trip, 1971.

Allan and Hazel arrived in 1969, just after the major flood. Their plane landed in Winnipeg, and from there they rode a Greyhound bus south to Fargo. Allan's one thought as he stared through the bus window at this flat, unending landscape so distant from the sea was, "*Oh my gosh!*" (Well, his actual words were somewhat different).

Arriving with Allan, as well, onto the North American continent was the science of fossil insect analyses. Allan's first major study was the 18-Mile River site in Ontario, a work that still today stands as both classic and pioneering. From this initial effort developed a body of North American literature that is awesome.



Allan Ashworth, field studies in Chile, 1979.

But Allan was not to stop here. He extended his fossil insect field studies to South America, then to China, then to the high Arctic of Canada and Alaska, and then to Antarctica. Over the years, Allan's research was supported by millions

of dollars of grants, awarded primarily from the National Science Foundation. Allan served as the



Allan Ashworth holding early Holocene wood from the Poplar River Formation, Seminary site, Fargo, 1984.

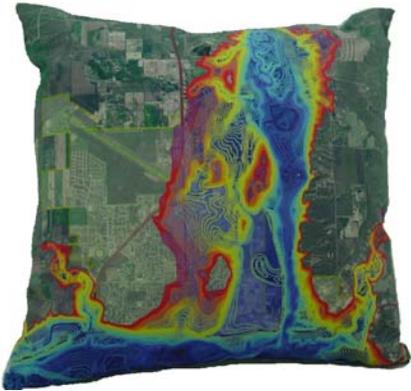
Chair of the USNC INQUA and as a Vice-President for INQUA. His work was featured in the film "*Ice People*," the NOVA documentary "*Secrets Beneath the Ice*," and in Science and in Nature. Fossil discoveries made in Antarctica were featured in articles in National Geographic and in the world press. In 2007, a glacier in the Supporters Range of Antarctica was named in his honour: the Ashworth Glacier. Likewise, in lasting legacy, entomologists have named four species of beetles after Allan: all of them *ashworthi*.

And, should you ever be in need of this service, Allan turns out to be an expert in the Heimlich Maneuver – having on separate occasions saved the lives of two individuals choking to death.

But, if the world knows Allan for his research, his students at NDSU have known him for his passion in teaching – both in the classroom and in the field. His fellow faculty have known him as a mentor, a wonderful colleague, a role model, and a great friend. NDSU has recognized Allan through a series of honors, capping it in 2007 with the title University Distinguished Professor. Allan has served this university and the world community of geologists as a dynamic teacher and the role model of professionalism.

Mr. Allchin would be so proud.

PILLOWS: A SOFTER LOOK FOR MAPS?



This colorful pillow (left) was produced in 2013 by Esri from a GIS-based map created by Jackie Stenehjem, under the mentorship of Peter Oduor.

At this year's Esri International User Conference in San Diego, a map from research work primarily conducted by Jackie Stenehjem with mentoring for GIS work from NDSU professor Peter Oduor was re-published by Esri . . . but on a pillow!

"I never . . . (ahem) . . . 'dreamt' that one of my former students would be published on a pillow," smiles Peter. "Now, how do I convince my department Chair that this is a high impact factor publication?"

The map was part of a dam failure study which used GIS and remote sensing technologies to analyze risks and potential losses for the city of Williston should Fort Peck Dam catastrophically fail. Williston is located 227 miles downstream from the dam. Since construction of the dam,

Williston officials have worried about safety if the dam were to fail.

Jackie's flood study found if Fort Peck Dam were to catastrophically fail at full capacity, Williston city officials would have barely two days to evacuate all of its residents. Once flood waters reached the city, the protective levee south of the city would be overtopped with 24 feet of water.

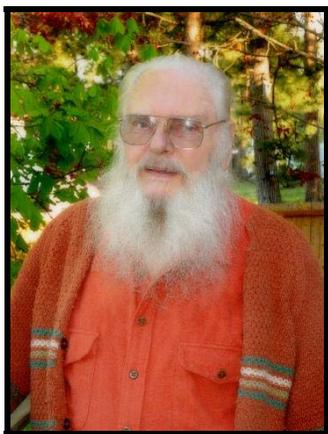
Funding for this research came in part from National Science Foundation (NSF), NASA, and National Geographic Education (NCGE), through iGETT (Integrated Geospatial Education and Technology Training). This iGETT catastrophic dam failure study was done as a community service project with a key public outreach component.



Alumni, students, faculty, and former faculty of the department gathered for the annual NDSU GeoAlumni Breakfast, October 28, 2013, at the Geological Society Annual Meeting (Denver). Clockwise from the lower-left: Jackie Wrage, Cheyanne Jacobs, Adam Lewis, Meredith Ramsey, Ashley Steffen, Jane Willenbring, Sara Evanoff, Andrea Oswald, Bernhardt Saini-Eidukat, Charles Metzger, and Stephanie Day.

TRANSITIONS: DR. ALEXIS VOLBORTH (1924 – 2009)

We have learned of the death of Dr. Alexis Volborth, who served as mineralogist/petrologist faculty at NDSU Geology from 1975 to 1978.



From his obituary in *the Lake County (Montana) Leader*, “Alex was born on July 11, 1924, in Viipuri (Wyborg) Karelia, Finland, the son of the late Alexis von Volborth and Ljubow Otille Augusta Schroeder. He joined the Finnish Army and served during WWII, and in 1947 married Nadia Hasso in Helsinki, Finland.

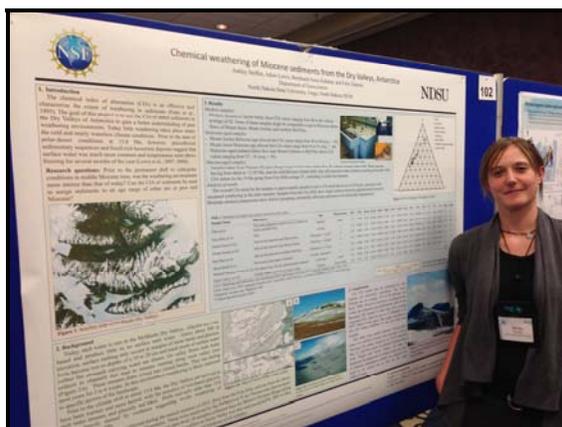
He had a lifelong passion for learning and earned numerous degrees; geology and

mineralogy (PhD), 1954; philosophy (mineralogy, geology chemistry) (MS), 1954; Philosophy, Eximia Cum Laude, (BS), all three from the University of Helsinki; postdoctoral: University of Vienna, University of Heidelberg, California Institute of Technology (Hoover Fellow), Pasadena, California.

Among his many positions as an educator, Alex was a professor emeritus at Montana Tech, a professor at Washington State University and University of Nevada, as well as a visiting professor in Irvine, California, Killam professor, Dalhousie University, Canada; visiting scientist, at NASA.

Reflecting on Volborth’s time at NDSU Geology, Allan Ashworth writes, “Alexis was as bright and as irrepresible an individual as I have ever met. I always got on well with him, but university administrators did not. We shared him with NDSU Chemistry in some strange arrangement - teaching responsibilities to Geology, research to Chemistry.”

A website in tribute to the natural history photography of Volborth can be found at: www.siennablu.com/VOLBORTHHOME



(Left): NDSU senior, Ashley Steffen, was recipient of Honourable Mention in the Jérôme H. Remick poster competition at the Geological Association of Canada/Mineralogical Association of Canada joint meetings in Winnipeg, May, 2013. The poster was co-authored by Adam Lewis, Bernhardt Saini-Eidukat, and Felix Zamora.



(Right): NDSU geologist, Donald Schwert (center) was recognized for his 12 years of service to NIH-sponsored North Dakota INBRE project at the Native American Health Research Conference in Grand Forks, November 2013.

WHERE ARE THEY NOW? MIKE BURTON, CLASS OF 1970

Most of the students who pass through our department end up as field geologists. But a wonderful few choose to dedicate their career to K12 earth science teaching. Mike Burton is one of those.

Following his graduation from NDSU, Mike kept up with his own learning through attendance at workshops and classes during the school year and summers to keep current in science and education. In 2008, he completed his M.S. degree program from Mississippi State University.



Mike Burton, front row, third from left, on the 1970 Southeastern Minnesota Field Trip.

Mike took to heart a call from mentor and fellow teacher, Ed Motl, to get involved in his chosen profession. Mike joined the Fargo Education Association, the North Dakota Education Association, and became a life member of the National Education Association. He not only joined but held numerous offices and committee positions at the local and state level. But science has always been his love, and in 1976 Mike became a member of the National Science Teachers Association (NSTA). While a member he attended eight national conventions and made presentations at four, was appointed to three committees and in 1989 was elected to the NSTA Board of Directors. In 1983, Mike became a charter member of the National Earth Science Teachers Association (NESTA) and in 1990 was elected president of NESTA. In 1977, at the state level, he became a member of the North Dakota Science Teachers Association (NDSTA). While a

member, he was treasurer, editor of their newsletter, elected president three times, and made numerous presentations at state conventions. In 1978, Mike was chosen North Dakota Earth Science Teacher of the Year, and in 1987 he was presented in Washington, DC with the prestigious National Science Foundation Presidential Science Award.

Mike also thought it very important to share what he learned with his fellow teachers. From 1991 to 2006, he was an Atmospheric Education Resource Agent for the American Meteorological Society (AMS). In 1999, Mike attended an Operation Physics workshop in Sacramento and for the next seven summers wrote grants and worked with Robert Brummond, a physics instructor from Concordia College, in presenting physics workshops to elementary teachers across North Dakota. In the early 1980's, Donald Scoby (NDSU) and Mike started the Science Olympiad in North Dakota, which has since involved thousands of students and their teachers from across the state.



Mike retired this past year after 41 years of distinguished Earth Science teaching in the public school classroom. Mike has a great fondness for the years spent at NDSU before and after getting his undergraduate degree. He would like to thank them, not only for the great education but for the wonderful stories he was able to relate to his students about the people from NDSU who shared their excitement and love of science with him.

DONATING TO NDSU GEOSCIENCES

Q: When I receive a mailing or that phone call from NDSU asking for a donation, can I target it to specifically support the educational and outreach programs in the Department of Geosciences?

A: Yes! Simply specify that your gift go to one of our three funds. All contributions to the fund are tax-deductible. Many employers will match the donations of employees; for information on how to provide a match, see: www.ndsufoundation.com/annualfund

Q: What is the purpose for each of the funds?

A: The GeoAlumni Endowment supports field courses and student scholarships. Even a one-time contribution can generate income for years to come through interest accrued to the account.

The Geosciences Fund supports our outside speakers and outreach programs.

The Mayflower Fund (established by the late Dr. Warren D. Kress) provides scholarship and travel support for our students in Geography.

<p>Please detach, and mail with your gift to: NDSU Development Foundation 1241 N University Drive PO Box 5144 Fargo, ND 58105-5144</p> <p>Name(s): _____</p> <p>Enclosed is my gift of \$ _____ .</p> <p>My gift is in honor of: _____</p> <p>Please allocate my gift, as follows: _____ % GeoAlumni Endowment (Fund #40092) _____ % Geosciences Fund (Fund #33238) _____ % Mayflower Fund (Fund #25762)</p> <p>Please make your check payable to: NDSU Development Foundation</p> <p>Thank you!</p>	<p>Payment options:</p> <p><input type="checkbox"/> Payment enclosed</p> <p><input type="checkbox"/> Please charge my credit/debit card</p> <p><input type="checkbox"/> AMEX <input type="checkbox"/> Visa <input type="checkbox"/> MasterCard <input type="checkbox"/> Discover</p> <p>Name on Card: _____</p> <p>Card No. _____</p> <p>Expiration Date: _____</p> <p>Security Code: _____</p> <p>Billing Address: _____ _____</p> <p>Phone: _____</p> <p>Signature: _____</p>
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TAX CREDIT OPPORTUNITY FOR DONATIONS TO THE GEOALUMNI ENDOWMENT

North Dakota residents and businesses that make gifts to qualified endowments (such as the NDSU GeoAlumni Endowment) may qualify for a state income tax credit, which amounts to 40 percent of the value of the gift, up to a maximum credit of \$10,000 per year. Planned gifts by individuals qualify for an income tax credit of 40 percent for gifts up to a maximum credit of \$10,000 per person, \$20,000 for a married couple with any excess unused credit to carry forward 3 years. This credit is on top of your federal tax deduction for charitable donations. If a donor is in the 35 percent federal tax bracket, the tax benefit may look like this:

Gift amount	\$5,000	\$25,000	\$50,000
Federal tax deduction	-\$1,750	-\$8,750	-\$17,500
N.D. state income tax credit	-\$2,000	-\$10,000	-\$20,000
Net cost	\$1,250	\$6,250	\$12,500

Please be sure to consult your own attorney, accountant, or financial advisor for advice on your situation.



Students of the department assisted Jessie Rock in designing and setting up at the main NDSU Library a public exhibit of fossils. Shown here are Sarah Wroblewski and Kristen Lorenz.

OFFERING “GEOGRAPHY” AT A DISTANCE

Addressing a growing demand, primarily from K12 teachers across the state, the Department of Geosciences took steps this Fall at offering courses at a distance. In cooperation with NDSU Distance & Continuing Education, Dr. Debasree Chatterjee-Dawn has been hired to teach introductory courses in Geography at a distance.

Debasree moved to Fargo from Atlanta, Georgia, where she taught courses at Kennesaw State University. Debasree earned her undergraduate degree in Geography and post-graduate degree in Geography with specialization in Remote Sensing and Terrain Evaluation from Visva-Bharati University in West-Bengal, India. She completed her PhD from Tohoku University in Sendai, Japan in Environmental Geomorphology.

Debasree’s research interests include geomorphology and GIS, paleo-environment, and process study in different climatic conditions. She is multilingual, fluent in English, Japanese, Bengali and German. Debasree enjoys nature, hiking, traveling, gardening, history, and reading

different genres. Beside her research interests and hobbies, she enjoys social service to



underprivileged children and women in different parts of the world. She notes that she is really enjoying teaching and life in Fargo!

NEWS FROM THE NORTH DAKOTA CHAPTER OF THE ASSOCIATION OF WOMEN GEOSCIENTISTS (AWG)



(Left): Becky Mink, paleontologist from the North Dakota Geological Survey in Bismarck, helps lead the career-mapping event held at NDSU. (Right): Undergraduate women present research posters at a public event held at the Red Raven coffee shop in downtown Fargo.

The North Dakota Chapter of the Association for Women Geoscientists (AWG) was launched in October 2012. In its first year, the chapter focused its efforts on meeting the needs of undergraduate members. Included were several networking meetings and two, larger-scale events.

At the career-mapping event, women professionals in geosciences graphically shared with undergraduates how events in their lives led them to the place they are at now – how the twists and turns in life led them to interesting places and

rewarding careers. At the poster session, ten undergraduates from NDSU and MSUM presented posters of their research. This event attracted, as well, members of the Fargo-Moorhead community. Students used this opportunity to practice presenting their research to people from a variety of backgrounds.

To learn more about membership and opportunities in the North Dakota AWG, contact either Stephanie Day or Jessie Rock at NDSU Geosciences.

NEWS FROM OUR PAST FACULTY

GREGORY J. McCARTHY (NDSU Geosciences, 1979-1993)



Greg and Denise McCarthy have continued their travels over the last six months. In June, they were in the UK, including the Southeast and West

Midlands in England and Northern Wales. Geological highlights included the White Cliffs of Dover (*photo*), and the early industrial area of Ironbridge Gorge with its deep valley cut into easily-mined beds of coal, limestone and iron ore. September found them in Gettysburg during its 150th anniversary year. Here, outcroppings of a resistant diabase sill provided the hills and ridges (Cemetery Hill/Ridge, Culps Hill, the Round Tops) on which the Union based its defenses.

JOHN A. BROPHY (NDSU Geology, 1959 – 1982)

John and Peggy write that they are still enjoying life in beautiful Oregon with occasional visits to the spectacular coast and the equally spectacular mountains. They send greetings to our many friends among the alumni and faculty.

ELAINE HATZENBUHLER
(NDSU Geosciences, 1982 – 2011)

Elaine writes, “*Retirement is paying yourself to do what you love*” is the message in a current TV ad. We are following that philosophy.

Our time is split between Arizona and Moorhead enjoying the best weather in both places. Returning to Moorhead last April we experienced winter but it only lasted about a week. That was enough winter for us. The rest of the summer was great and even completed the Moorhead “To Do” list with the exception of a trip to Hawaii. That tops the 2014 list now.



I was invited go along on the North Shore Field Trip and the Paleontology of Southeast Minnesota during the fall. They were great trips, super geology, and terrific people to share that time with. It was a bonus to see a few of our alumni along the way as well. I appreciate the continued connection to the Department and the opportunity to participate on these trips.

In Arizona, Jim continues to bowl. Last winter he had his best season ever with a 213 average! I joined a rock club, did some collecting on field trips, and saw places in Arizona I may never find again. We continue to do things we have always enjoyed like wine tastings, walking (now outdoors in the winter), and going to vintage car shows. There are lots of great old cars here to see. Our great old car – the ‘68 Camaro, continues to reside in Moorhead. Last summer marked 45 years of my owning it (*photo*). The offer to go to the Dairy Queen in it with me still stands.

I hope you’ll stop by when you are visiting Fargo-Moorhead it would be great to see you!

FIELD STUDIES IN AMERICAN SAMOA



(Left): Clay Knudson (graduate student), Jeffrey Clark, Donald Schwert, and Stephanie Day on Ofu Island, American Samoa. (Right): Stephanie Day doing terrestrial laser-scanning of a World War II gun emplacement pillbox near Pago Pago.

With support from a new grant award from the National Science Foundation, Donald Schwert and NDSU archaeologist Jeffrey Clark returned to tiny Ofu island in American Samoa for five weeks of field work. Joining Don and Jeff (and NDSU undergraduate and graduate students, including Geology undergrad Carrie Fagerland) was Stephanie Day. Day transported her terrestrial laser-scanning equipment to the island, so as to image in 3-D archaeological sites (mounds, ditches, terraces) and match them into aerial DEM data. The plan is to develop better predictive models for discerning key archaeological features, even in regions of dense jungle foliage.

Day *et al's* initiatives in American Samoa have since been rewarded by her team receiving a new grant from NASA EPSCoR to develop (with NDSU computer scientist Anne Denton and University of Auckland PhD student Seth Quintus) and field-test sophisticated algorithms for implementing these models.

In her spare time in American Samoa, Day tested the laser-scanning technologies on World War II historic sites on the island of Tutuila. This supplementary work was service in support of local and national efforts to identify and preserve historic sites (even though recent) on the islands of American Samoa.



In November, 2013, NDSU GeoAlumni Jerrold (“Jerry”) Mayer (’76) and David Fischer (’77) co-taught a petroleum exploration section for Allan Ashworth’s Sedimentology/Stratigraphy course. Jerry is executive vice-president of Zavanna LLC in Denver. Dave is president of Fischer Oil & Gas in Grand Forks. *(Left):* Jerry, Allan, and Dave. *(Right):* Jerry and Dave review Williston Basin well logs with geomajors Darin Wilwand and Rachel Scullen.

FACULTY UPDATES

Bernhardt Saini-Eidukat has enjoyed returning to the “regular” faculty. His research interests continue to be based around geochemistry and mineralogy in a variety of soils, sediments and ore deposits. One project involves collaborative research with Adam Lewis and his students to understand the weathering processes of glacial materials in the Dry Valleys of Antarctica. He also has a new project underway to quantify the amount and composition of respirable dust generated in the oil affected counties of western North Dakota.

In addition to research, last year Bernie took over the responsibility of teaching Field Geology with generous assistance from Allan Ashworth. He also led two week-long field experiences: a field course on the geology of the Big Island of Hawaii during Spring Break 2013, and the fall 2013 Geology of the North Shore of Lake Superior course. He thanks the Geosciences faculty and Mrs. Hatzenbuhler for helping with those courses, and gratefully acknowledges alumni and friend contributions to the GeoAlumni Endowment for support of field experiences.

Adam Lewis continued his Antarctic research program. The focus of the NSF-funded study, begun in collaboration with Ken Lepper, is to look for evidence of snow and ice melt adjacent to margins of the East Antarctic Ice Sheet. Today almost no melting takes place under the extremely cold and dry climate but well-developed channels leading away from glaciers and snowbanks suggest melting has taken place in the recent past.

As part of the project, graduate student Felix Zamora and undergraduate Ashley Steffen mapped channels and alluvial fans in the Dry Valleys region of Antarctica in 2011-12. Both completed research projects and graduated in 2013. Their work identified melting processes and showed that brief but intense warming events have caused melting along ice sheet margins as recently as 1,500 years ago. Graduate student Meridith Ramsey is dating more of these samples using OSL in Lepper’s lab. Her latest results show that melting pulses also occurred about 10,000 and 40,000 years ago. She is finalizing work on a last sample set and will begin to compile her results into a thesis for graduation in 2014. With these results in hand, Lewis and Lepper can identify the climate factors that caused melting. These studies are important because the potential for melting along terrestrial Antarctic ice margins is the least understood input to global climate models.

Ken Lepper published two papers on Lake Agassiz. The first provides the only geologic ages for beach ridges along the transect where in the late 1800s Warren Upham named the beach lines for towns in west-central Minnesota: Herman, Norcross, Tintah, and Campbell. With these new data, the cause of the Moorhead low water phase was questioned by collaborators with Lepper using a hydrologic balance and sensitivity model that lead to a second paper. Ken’s ages for Lake Agassiz are shedding new light on the lake’s history and its relationship to global climate

change. Stay tuned for new hypotheses and interpretations that were not possible without the robust chronology Ken is developing with OSL dating. He also participated in research and manuscript preparation for two papers that will be included in a forthcoming GSA Special Paper on geomorphological features and shoreline evolution around the Great Lakes.

Jessie Rock marked her third year of teaching at NDSU Geosciences this Fall. She's been busy revising curricula and adding a technology component to the introductory labs including ArcGIS Online and Google Earth activities. This year, she facilitated several outreach events including National Fossil Day, Dig into Reading at the Fargo Public Library, and Planet Earth (a teen geology workshop) at the Moorhead Public Library. On campus she volunteered at Darwin Days, Science Olympiad, and Science Fair, and Expanding Your Horizons workshops. Last summer, Jessie taught a week-long geology workshop for the NDSU STEM Kids Camp and

compiled educational materials for the ND Forest Service Project Learning Tree Program.



Outside of NDSU, Jessie is enjoying her growing family. Oscar turned 2 in July and loves the outdoors. Oscar and Mike (*photo*) accompanied Jessie and the Department on the Lake Superior field course in September. Jessie and Mike are expecting a daughter at the end of February. They are all excited, especially little Oscar who plans to, “show her how to do puzzles” and “feed her snacks.”



Post your news and your latest geo/family photos, and follow us on NDSU Geosciences' Facebook page:

www.facebook.com/#!/NDSUGeosciences



The NDSU Geology Club continues its long tradition of a Holidays Rock Sale. Funds generated from this annual sale go toward the club's service, outreach, and museum/field travel activities – as well as pizza and pop for their on-campus activities. Shown here, supporting this December's effort are club members Christina Lammers, Nichoal Gordon, and Andrea Oswald.

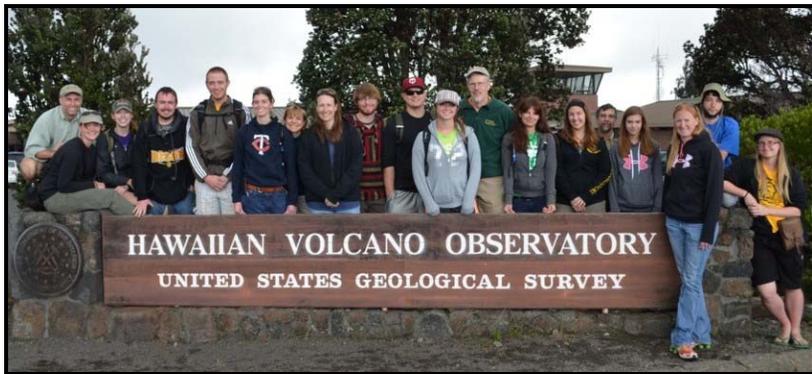


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Supporting broad-based, field-training opportunities for the Geology undergraduates continues to be a central academic focus of the department. Among those courses offered in 2013 were: *(left)* the Hawaii volcanics field course, *(lower-left)* the North Shore of Lake Superior field course, and *(lower-right)* the paleontology field course.

