

Spring 2017

Earth News, v40, Spring 2017

University of Northern Iowa. Department of Earth and Environmental Sciences.

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DEPARTMENT OF
EARTH AND ENVIRONMENTAL SCIENCES

EARTH NEWS



SIOBAHN
MORGAN

**Hello Alumni, Friends, and Family of the
Department of Earth and Environmental Sciences
at the University of Northern Iowa,**

Yes, this is the same department as before, but we're putting forward our degree offerings of both Earth Science and Environmental Science into our name, so students know where they should go if they have an interest in studying the physical environment of the Earth. It has taken a bit of getting used to, especially when I have to write out the name in various forms — it does get tiring. I've taken to abbreviating it as EES, which does cut down on the time needed to fill out forms.

Things have been going at a hectic pace this past year, though there have been times of relative calm and serenity scattered in with the frenetic activities. We're continuing with the usual business of teaching undergraduates, guiding them in research activities, and contributing to the community through a variety of service projects, but we've had some significant news this year. There are other articles in the newsletter which talk about these in more detail, so I'll just give you the headlines —

- Record number of majors
- Significant equipment grants to support introductory and advanced courses and student research (over \$500,000). There is also a small amount of remodeling to accommodate the equipment.
- Award winning chapter of Sigma Gamma Epsilon
- Award winning faculty

Another feature that has been highlighted this year across campus is the incorporation of experiential learning into courses and degree programs. In our department that takes a variety of forms — student research, hands-on lab experiences, service projects that are part of a course, and internships. You may have done these things — and if you were a major you certainly did — so now you're probably wondering why are these things now in the spotlight. I'd suspect a lot of this has to do with the need for students to become comfortable dealing with real-world problems and experiences. Some majors have no such experiences, students are just passively involved in their education — they may be learning, but they aren't doing. Our students leave UNI with more skills and experiences that can translate into meaningful careers.

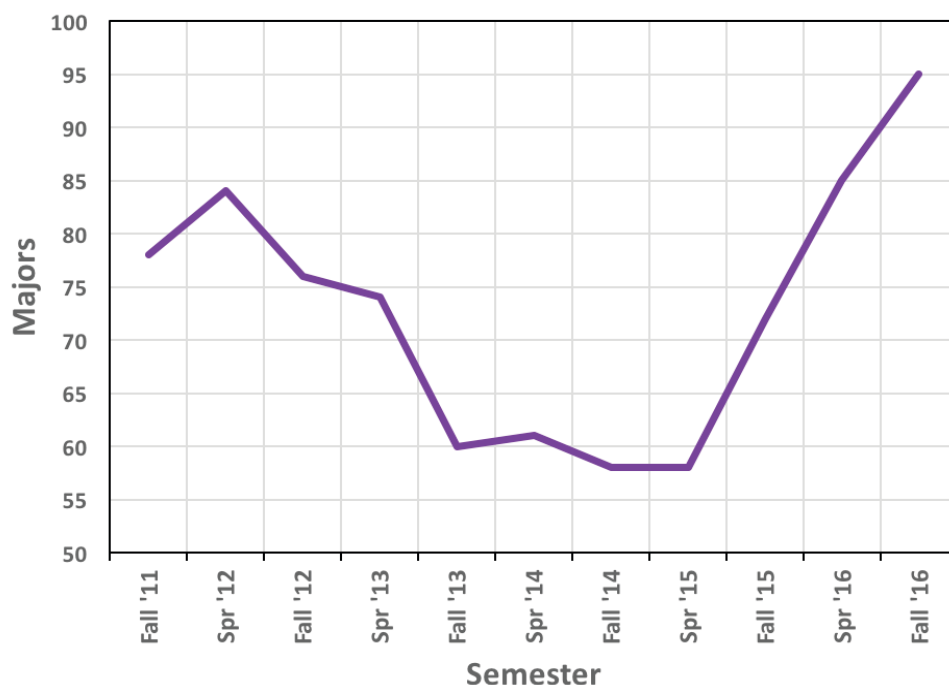
I hope you enjoy this newsletter and continue to support our department. With all of these extra students to look after, we are busier than ever, and alumni support in any form is appreciated. I also hope to hear from you about your experiences and lives — don't be shy about bragging, we love to hear about it!

Siobahn Morgan

P.S. Let me know who you think is on the back page! This department continues to be rather free-spirited.

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DEPARTMENT GROWTH

As many of you recall, 2012 was an unexpected turning point for the department. We had just received a very positive review of our degree programs from external reviewers, the number of majors were at an all-time high, and we were putting forward a new degree program in Environmental Science. That suddenly changed with drastic cuts of the degree programs in Geology BA, Geology BS, and Earth Science - Interpretative Naturalist BA, along with the cuts of three minors, Astronomy, Meteorology and Geology. More importantly, we ended up losing talented faculty along with the degrees.

Since then we've had a great deal of change, most of it due to the new Environmental Science degree, which has brought in many new students. We also were able to resurrect the minors in Geology and Astronomy, and we've retooled the Meteorology minor into an Air Quality minor. The graph that is provided shows our "official" total number of majors which is calculated at the end of the second week of each semester.

Over the past two summers I've welcomed more than 15 new majors into our department at freshmen orientation, and typically we've had 10-15 current UNI students switching their major into our department. While we are welcoming new students in, we are also graduating about 20 students each year, and the end result has been growth. Today, we are currently at 98 majors!

I suspect that our growth is due to several factors. First are the popular introductory courses we offer, which allows students the opportunity to learn about our department and the degrees that we offer. Couple that with talented faculty teaching these courses, and the end result is a strong incentive for students looking for a welcoming place. There is also the change in the Iowa Core Curriculum and the inclusion of Earth and Space Science in the 9-12 grade classes across the state. This has resulted in more students coming directly out of high school with an interest in geology, hydrology, meteorology and environmental issues — something we were not able to depend upon 5 years ago.

Regardless of the cause, we are seeing steady growth in our majors and renewed interest in our department, courses and research projects.

FACULTY UPDATES



ALAN CZARNETZKI
PROFESSOR OF METEOROLOGY

Courses taught in Fall 2016 were Elements of Weather, Elements of Weather Laboratory, and Air Quality. Courses offered in Spring 2017 will be Elements of Weather and Meteorology.

Highlights of past year include:

- 1) Conversion of Weather Analysis and Forecasting to a fully on-line format; the inaugural edition of the course was taught in a 6-week session in Summer 2016 and is planned again for Summer 2017. Over half the class was composed of in-service science teachers.
- 2) I enjoyed serving as a judge of student presentations and posters at the National Weather Association's Severe Storms Conference in Spring 2016.

I am planning for possible involvement with the Lake Michigan Ozone Study in May and June 2017. The Department's microwave radiometer and sodar would be used to collect weather observations during an intensive sampling period along the Wisconsin shore of Lake Michigan.



KYLE GRAY
ASSOCIATE PROFESSOR
OF EARTH SCIENCE AND SCIENCE ED

This year has been eventful and busy. In the summer, I brought home a pair of dinosaur horns that my grandpa found in the 60's. Once I get them put back together, I'll need to find a place to show them off. For the fall, I continued teaching Inquiry into Earth and Space Science — the content course for elementary education majors, and I taught Intro to Geology for the second time. I am enjoying the chance to teach geology and hope to continue doing so in the future. This spring I am teaching Investigations

into Earth and Space Science — a follow-up course for EI Ed majors pursuing a minor in science teaching. I am also teaching Earth Materials - a brand new course that delves into how rocks and minerals form, how they are identified, and their uses in our modern society. This class is a big challenge for me, but I am relishing the opportunity to teach this upper-level course.

The year has seen a couple of successes on the research front. Along with Alexa Sedlacek, I am investigating the different ways that students understand mass extinctions. We have found some amazing ideas and presented some of our findings at the annual meeting of the Geological Society of America. By the time you read this, I will have a paper published in the February issue of the Journal of Geoscience Education. This summer will be spent tidying up these projects. I also hope to lead a field trip for the Earth Science Educator's Rendezvous in Albuquerque, NM. Other than that, I'll be working around the house or thinking up new places to visit.



CHAD HEINZEL
ASSOCIATE PROFESSOR OF GEOLOGY

In Fall 2016, I taught Introduction to Geology and Geomorphology. In Spring 2017, I will again be teaching the Intro course.

Last summer I led UNI Capstone in Southern Italy to Catania, Sicily and Mount Etna, and also built a bomber rabbit hutch.

I am hoping to lead a course next fall to the Northern Rockies before the Earth's anthropologically created global climate change/warming removes glaciers from Glacier National Park.



THOMAS HOCKEY
PROFESSOR OF ASTRONOMY

I taught introductory astronomy in the Fall and will do so again in the Spring. I already am excited by a field course I am offering to observe August's total solar eclipse.

This year I won the American Astronomical Society's Osterbrock Prize for best history book. I continue to serve on the Society's Working Group for the Preservation of Astronomical Heritage.

Next summer I'll teach on-line Astronomy. I hope to travel—somewhere! (I do know that I will be attending the Biennial History of Astronomy Workshop, but that's only as far as Indiana . . .)



MOHAMMAD IQBAL
PROFESSOR OF GEOLOGY

My students and I are actively involved in a project in Nepal conducting environmental assessment of an urban river in the highly populated capital city of Kathmandu. We have just finished the second year of field work in the Kathmandu Valley. Our team is now preparing to go back to Nepal next summer to work on industrial and municipal pollution source inventory. In fall 2016, I taught Intro to Geology and Field and Lab Methods in Hydrology courses. My spring 2017 teaching duties include Intro to Geology and Hydrogeology. I recently published a peer-reviewed research article in Asian Journal of Water, Environment and Pollution. I received a Regent's Award for Faculty Excellence for 2016.



LEE POTTER
INSTRUCTOR

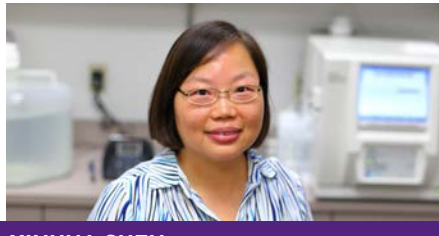
This has been a crazy year. My wife, Karen, is wrapping up her final year of a master's program at UNI while I taught two sections of Environment, Technology, and Society capstone in Fall 2016. Progress on my research into New Mexico igneous rocks was slowed by the unexpected (and uninvited) appearance of the 2016 Flood. A high point for this year is the opportunity to obtain some high-precision radiometric ages to support the New Mexico research. Plans for 2017-2018 are always in flux, but if the stars align, Dr. Sedlacek and I are contemplating another trip to the Southwest.



AARON SPURR
INSTRUCTOR OF SCIENCE ED AND
FIELD EXPERIENCE COORDINATOR

This academic year I am teaching Inquiry into Earth and Space Science, Current Technologies in Science Teaching, Astronomy Laboratory, and Level 2 Field Experience. Next year will be my 20th year at UNI. I have been enjoying this year a great deal, partly because I have been able to be in the classroom more than in previous years. I also supervise students during their Level 2 field experience, but do less of that than before.

Earlier this year my family moved into a new home. We had it built to just the size we wanted on the edge of town where it's quieter and there are big open spaces. Another big family event is that my daughter now has her driver's permit. The big open spaces are helpful for practice driving as well.



XINHUA SHEN
ASSISTANT PROFESSOR OF
METEOROLOGY AND AIR QUALITY

In Fall 2016, I taught the course Elements of Weather, which is required for all of the majors in the Department of Earth and Environmental Sciences. I also taught one advanced course, Measurement and Analysis of Air Quality. In the Measurement and Analysis of Air Quality class, various instruments were used to measure the trace gases, particulates, and precipitation samples. Satellite observation data acquired from the NASA website were also used for the air quality analysis. As the outcome from the air quality analysis during this class, two abstracts were submitted to the 2017 Air & Waste Management Association's Annual Conference.

In the spring of 2017, I will be teaching Elements of Weather and Air Quality Modeling courses. In the Air Quality Modeling class, the U.S. Environmental Protection Agency (EPA) preferred/recommended models such as AERMOD modeling system will be used to do the simulation of how air pollutants disperse in the atmosphere. Another air quality model CAMx will also be introduced to let students gain hands on experience and skills of using state-of-the-art modeling system.

For the 2017-2018 academic year, I will continue to improve my teaching and keep working on the air quality lab development, as well as services to the department, UNI, and community.



ALEXIA SEDLACEK
ASSISTANT PROFESSOR
OF GEOLOGY

I taught Earth History and Sedimentary Geology in Fall 2016 and I will teach Fossils and Evolution and Earth History in Spring 2017.

I presented my current research on strontium isotope stratigraphy of the Permian-Triassic boundary from China and Turkey at the 2016 national GSA meeting. I look forward to writing up these results and publishing them in 2017!

I took undergraduate student Bobbi Minard back out to the Great Basin to continue our Permian-Triassic field work that we started during summer 2015. We visited 3 sections in Utah and Nevada and only had two run-ins with rattle snakes. Highlights included cooking over camp stoves, hiking in the Valley of Fire, and meeting three senior citizens from the Friends of Paleontology in the Confusion Range of Utah. I have never seen anyone else out there before.

I'm hoping to develop another field course to be offered during the 2017-2018 academic year. I am currently exploring options to take a group of students to San Salvador Island, Bahamas. However, if the logistics of that prove too difficult it may be time to take students back to Big Bend National Park and Guadalupe Mountains National Park!



MIKE STEVENS
INSTRUCTOR

Things have been chaotic this past year. I sort of feel like I've been on a trail and looking at the little paths that lead off of it (i.e. loss of uncle and aunt within a month, addition of another fur baby to the family, and body parts wearing out). I see in the distance that the path will be diverging, but I guess I will decide on which way to go when I get there. I've been teaching Inquiry into Earth and Space Science and am scheduled to do the same in the Spring. I am trying to have the students make connections between the NextGen standards and material studied in class. At the same time, I've been modifying activities from the Old Earth Science Curriculum Project (because it's still the best thing out there) such that the students learn content and have something to take with them once they get their own classrooms. Guess I'm trying to create a little Scientific Educational Uniformitarianism.



SGE NEWSLETTER

It has been another eventful year for SGE! We have been involved with many on campus events, accepted new initiates into the organization and even had a group holiday party. As excited as we are to be gaining so many new members, we are saddened by the moving on of members as they graduate. We expect great things from those graduating and are excited for the new adventures they will be experiencing.

There has been a great addition of new members to the SGE group! The number of initiates for the spring 2016 was 7, while for the fall semester there were 8 initiates. These additions plus the four faculty members puts our active members for the fall at 27! Our current officers are Terra Perez (President), Taylor Garton (Vice President), Bobbi Minard (Secretary) and Emily Engle (Treasurer). In April elections will be held to select the chapter's new officers.

The chapter has been extremely active and has participated in a myriad of events this past year. We participated in Sunday at the Quarry on October 2nd of 2016. A wide array of activities were available for participants of all ages. Members Paige LaPlant and Maddie Nelson hosted an informational booth, talking about fossils found in and around Iowa! There were activities such as digging for prizes, cracking open geodes, searching for calcite crystals, and making your own pet rock! Another fun event was the Halloween House hosted at McCollum Science Hall. SGE led the Spooky Spelunking event in which children made their way through a cave constructed by members of our chapter. We also included phosphorescent minerals to show the people coming through. This event allowed our group to educate in a fun and exciting setting. We also gave out calcite crystals during the event put on by the American Chemical Society at UNI.

We have had the chance to unwind and do some fun things as a group over this past year as well. One that was a particular hit was our Holiday Christmas Party. Members and non-members were invited to come to our student room to eat holiday treats and play the white elephant present swapping game.

SGE has many things to look forward to in the upcoming year! We are in the process of designing and ordering hats. These products serve not only to support this chapter of SGE but also provide an environmental clothing line for our enthusiastic members! SGE was also invited to work with the Boys and Girls Club to help facilitate learning about different earth and environmental topics.

Thanks so much for the support and involvement. We are looking forward to another exciting year!

Yours Truly,
Terra, Taylor, Bobbi and Emily of the 2016 Chapter of SGE

Local Chapter Officers Bobbi Minard, Taylor Garton, Terra Perez and Emily Engle and SGE National Secretary-Treasurer, Dr. Jim Walters.

Gamma Sigma at the University of Northern Iowa was recognized as a Quality Chapter for achieving excellence by providing a quality program to its members. The UNI Chapter was also awarded the Chapter Service award for completing a significant number of outreach and/or service projects(s) during the year.





CONGRATULATIONS 2016

2016 GRADUATES

Spring 2016

Zachary Creery — Environmental Science
Blaize Cabell — Earth Science
Jayna Brechwald — Earth Science
Aaron Schroeder — Earth Science & Environmental Science
Karl Dietl — Earth Science Teaching
James McCormack — Earth Science Teaching
Alexander Tagtow — Earth Science Teaching

Summer 2016

Robert Spielbauer — Earth Science, Environmental Science & Biology: Ecology and Evolution
Kathryn Patrick — Earth Science & Environmental Science

Fall 2016

Cody McCoy — Environmental Science
Madison Beeler — Earth Science Teaching
Andrew Starkey — Geology B.A.

SCHOLARSHIPS AND AWARD WINNERS

KAYLA BECK

Earth Science BA and Environmental Science BA
Knapp Earth Science Scholarship
Jessica Allen Terri Endowed Scholarship

BLAIZE CABELL

Earth Science BA
Student Opportunities for Academic Research (SOAR)

ZACH CREERY

Environmental Science BA
Donald and Marguerite McKay Scholarship

KEITH DOORE

Earth Science BA and Physics BS
Larry A. Kelsey Memorial Scholarship
Summer Undergraduate Research Program (SURP) Award
NASA Iowa Space Grant Consortium STM Scholarship
Clifford McCollum Scholarship
Physics STM Scholarship
CHAS STM Scholarship

TAYLOR GARTON

Earth Science BA and Environmental Science BA
Earth Science STM Scholarship

JAMES JANSEN

Earth Science BA
Earth Science STM Scholarship

PAIGE LaPLANT

Earth Science BA and Environmental Science BA
Earth Science STM Scholarship
Jessica Allen Terri Endowed Scholarship

BOBBI MINARD

Environmental Science BA
NASA Iowa Space Grant Consortium STM Scholarship

RILEY MULLINS

Environmental Science BA
Charles J. Hearst Scholarship
Summer Undergraduate Research Program (SURP) Award

DANIEL NIELSEN

Environmental Science BA
Earth Science STM Scholarship

HANNAH OAKIE

Environmental Science BA
Earth Science STM Scholarship

GRANT OLBERDING

Environmental Science BA
Donald and Marguerite McKay Scholarship
CHAS STM Scholarship

BRADLEY O'CONNELL

Earth Science Teaching BA
Louise Hearst Speer Memorial Scholarship
Bill and Teri Brecht Scholarship
CW Lantz Scholarship
Grace Ohrtman Scholarship
Streitberger/Mohr Science Scholarship

KATIE PATRICK

Earth Science BA and Environmental Science BA
NASA Iowa Space Grant Consortium STM Scholarship

TERRA PEREZ

Environmental Science BA
Jan Harken Scholarship
W.A. Tarr Award

NOLAN SAGAN

Earth Science BA and Environmental Science BA
Earth Science STM Scholarship

BOB SPIELBAUER

Environmental Science BA and Biology: Ecology and Evolution BA
Earth Science STM Scholarship
Purple and Old Gold Award

MORGAN STREFF

Environmental Science BA
Earth Science STM Scholarship

EDDIE TODD

Earth Science BA and Environmental Science BA
C.W. Lantz Undergraduate Scholarship

INTERNSHIPS

CANDACE KUCERA

Earth & Environmental Sciences BA
Black Hawk Soil & Water Conservation
Soil Conservation Aide
Summer & Fall 2016

NATALIE GALLEGOS NUNEZ

Earth & Environmental Sciences BA
Black Hawk Soil & Water Conservation
Water Monitoring Analyst Intern
Summer & Fall 2016

MATT MCINTOSH

Earth & Environmental Sciences BA
Iowa Waste Reduction Center
Environmental Specialist Intern
Summer 2016

CHAD OLTHOFF

Earth Science BA
Winnebago County Conservation Board
Natural Resource Technician Intern
Summer 2016

GRANT OLBERDING

Environmental Science BA
Olberding Environmental
in Sacramento, California
Field Biologist
Summer 2016



SUNDAY AT THE QUARRY

SUNDAY at the QUARRY gives UNI students and faculty an opportunity to provide a wide range of educational hands-on activities to children and adults. This event sponsored by BMC Aggregates provides a chance for the general public to learn more about Earth and Environmental Science. The event took place at BMC's Raymond Quarry on October 2, 2016. It was a great way to start Earth Science Week!

ALUMNI SPOTLIGHT

AARON STOLLEY



Originally from Marion, Iowa, Aaron Stolley graduated from UNI in December 2014 with a B.A. in Geology. Aaron now serves as a Water Resources Specialist with the Arizona Department of Water Resources. While it took some time to find a career in his field, Aaron's experiences at UNI and post-graduation helped him make connections and learn new things that set him on the path to his current position.

After moving to Arizona after graduation, Aaron worked in landscaping while applying for jobs in geology. A year after graduating, Aaron interviewed for and was offered a hydrology job with the State of Arizona, and later became a Water Resources Specialist. In his current position, he works in the field services section and collects groundwater data. "For about six months out of the year, we drive all over Arizona and obtain depth to water measurements in wells. Once that data is collected, it goes onto a database where our modeling section can access it and the public can also view water level information through our website," he said.

For Aaron, it wasn't just the education at UNI that helped him in his career, but the community as well. "I think what most prepared me for my career were the awesome people at UNI," said Aaron. "Whether it be all the friends and connections I made outside of class or my classmates and pro-

fessors in the Earth Science Department, having such a positive influence really helped me stick with earth sciences and find something that I love doing." In addition to his time at UNI, Aaron also attended a summer field camp at Western Michigan University that focused on hydrogeology. Through this combination of experiences, Aaron gained the skillset that he now uses for his job.

Aaron's advice for current Earth and Environmental Science students is to be patient and take chances. "You're not going to be done with college in a year, so relax and have fun," he said. "I'll say it again: be patient, trust your gut, and you'll always find something that you'll enjoy doing."

"Also, go on the trips that the department offers. I never went on one and it's one of my biggest regrets from college," Aaron added. "What better way to spend your summer than traveling the country or world and adventuring with your classmates and professors?"

"After you graduate, it can be scary going into the real world and finding a job. The best thing I can tell you is again to be patient and don't be afraid to work" said Aaron. "It took me a year to find a job in my field, but no matter how lost and out of hope I felt, I didn't give up."

ALUMNI SPOTLIGHT

ALLYSON ANDERSON



Allyson Anderson graduated from UNI in 1997 with a B.S. in Geology and a B.A. in Music. An Iowa native, she now lives and works in Washington, D.C. as the Executive Director of the American Geosciences Institute and an adjunct professor and Energy Scholar at Georgetown University's Science in the Public Interest Program.

"I have used all of my acquired knowledge concerning geology and the Geosciences in every step of my career. I have used it to provide sound, unbiased technical advice to policy and decision makers," said Allyson. "My experience with the earth sciences influences nearly every decision that I have made."

While at UNI, Allyson had the opportunity to attend field camp at the Wind River Range in Wyoming to study alpine glaciation and geomorphology. The combination of a solid academic foundation and applied work prepared Allyson for her future career path and taught her to always respect the science, utilize fundamental scientific methodology for research and to have fun wherever the research took her. "By really learning core fundamental concepts and then coupling them to real world field experiences, I was able to have a sound foundation for continuing my education throughout my masters work and beyond," she said.

Another aspect of her time at UNI that helped her throughout her career was the early exposure to professional societies and leadership opportunities through Sigma Gamma Epsilon, and encouragement to attend professional meetings such as the Geological Society of America, American Association of Petroleum Geologists and more. "I joined most of the organizations as a student and continued to engage throughout my career — this ultimately led me to the American Geosciences Institute," said Allyson. "I was first exposed to AGI as an early undergraduate student and have been hooked ever since."

For current Earth and Environmental Science students, Allyson advises building a strong foundational understanding of the fundamentals, focusing on technical experience, doing fieldwork and pursuing their passion. "Let's face it, geology and earth science is complex!" she said. "If students focus more on learning processes and how different systems interact at a fundamental level, they will excel later in the job market."

Allyson believes that the key to success in a position lies not only in having the necessary skills but having a passion for the work as well. "If you pursue a career in something that brings you joy or fulfillment, you will ultimately get further and advance more quickly. In nearly every

person that I have hired over the years, the standout candidates are those that feel the deep importance in what they are doing. They dig in and ultimately excel more quickly than their peers who don't feel as passionate about their work or career," said Allyson. "I pursued geology because I have a passion for geoscience that has not waned, but intensified over the past two decades."

"Today's science is focused more on team collaboration than on the individual — it is cross-cutting and multidisciplinary," she said. "The earth sciences are more relevant than ever."

CONGRATULATIONS TO FACULTY

DR. THOMAS HOCKEY

Osterbrock Award

The Prize Committee of the Historical Astronomy Division (HAD) of the American Astronomical Society has awarded the 2017 "Donald E. Osterbrock Book Prize for Historical Astronomy" to University of Northern Iowa Professor Thomas Hockey for the Biographical Encyclopedia of Astronomers. This prize is awarded "biennially to the author(s) of a book judged to advance the field of the history of astronomy or to bring history of astronomy to light."

The Biographical Encyclopedia of Astronomers consists of four volumes, filled with biographies of 1,800 astronomers. Hockey, who was editor and chief of the project, was assisted on the venture by 430 authors from roughly 40 different countries. The first edition of two volumes was published in 2007, and the second edition was published in 2014.

Hockey and the eight editors under him met to discuss the project about once a year. Hockey says the process took about seven years, and attributes the success of the project to the internet. "Without the internet," Hockey says, "a project of this magnitude would be nearly impossible."

DR. MOHAMMAD IQBAL

Regents Award

Dr. Iqbal, Professor of Geology in the Department of Earth and Environmental Sciences, was named one of the recipients of the Regent's Award for Faculty Excellence for 2016. This award is given annually by the Iowa Board of Regents to honor outstanding university faculty members who are exemplary teachers, and scholars, and who also contribute to a wide range of University and community service areas. Department Head Siobahn Morgan states, "Dr. Iqbal has developed a world-class environmental hydrology research program which benefits not only our students, but also Iowa's citizens, and individuals in other countries." "His research work on water quality is strongly entwined with his classroom content through the development of curricular materials that make use of the research equipment and methods at all levels of the Earth and Environmental Science curriculum." "Dr. Iqbal is an exceptional teacher." "Mohammad has also given freely of his time for service projects at the department, college, university and community levels."

DR. ALEXA SEDLACEK

2016 University Book & Supply Outstanding Teaching Award

Dr. Sedlacek has been at UNI since fall 2013 and has provided her students with excellent teaching experiences in courses such as Earth History, Sedimentary Geology, Oceanography, and Paleoclimatology, by combining content with hands-on-learning in the classroom, laboratory and field. One of her students stated, "Not only does Dr. Sedlacek strive for students' education, she inspires us to rally for ourselves. She provides us with the knowledge, confidence, and passion to truly become something. She cares truly and deeply, and is fully deserving of this award. Dr. Alexa Sedlacek is nothing short of a fantastic educator, because she does more than teach; she inspires."

DR. XINHUA SHEN

2016 Summer Fellowship Award

(Graduate College)

Dr. Shen received an 8-week Summer Fellowship from the Graduate College to work on her project, "Reducing Greenhouse Gas Emissions with Advanced Nano-engineered Materials".

DR. ALEXA SEDLACEK

UNI Summer 2016 Grant Writing Program Award

(Office of Research and Sponsored Programs)

DR. CHAD HEINZEL

UNI Conservation Corps Award funded by the Roy J. Carver Charitable Trust

UNI students in Dr. Heinzl's Fall 2016 Geomorphology class will complete an applied geomorphology project centered on the rural to urban Dry Run, Miller Creek and Black Hawk Creek Watersheds. The project aims to characterize the geomorphic and environmental aspects of these drainage areas in an effort to promote the understanding of fluvial processes (e.g. sedimentation, contamination and flooding) and landscape development. The project will encourage conservation measures through community engagement by communicating their scientific findings. Selected students will begin working with the UNI community to implement a stream bank erosion and surface water quality improvement project during the spring 2017.



**DR. CHAD HEINZEL'S
GEOMORPHOLOGY CLASS**

CARVER GRANTS

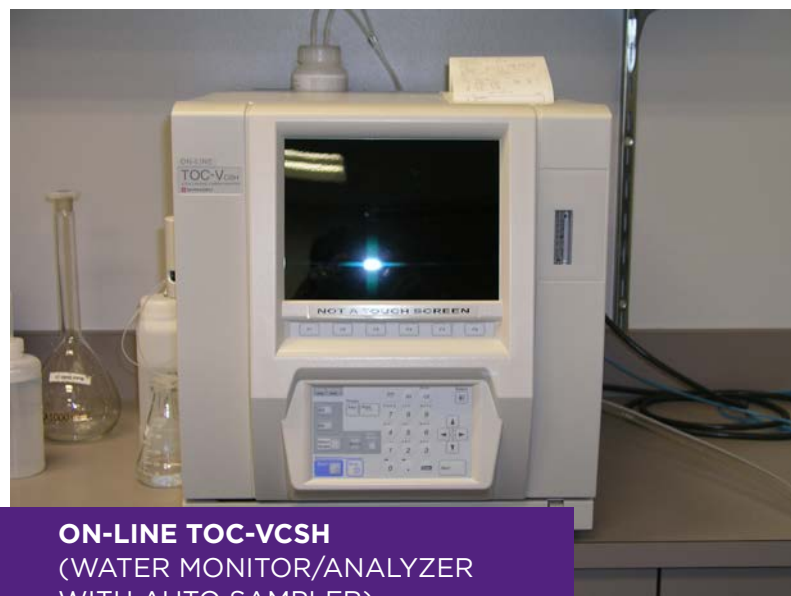
In April 2016, we were awarded more than \$490,000 from the Roy J. Carver Charitable Trust for the development of the Environmental Analysis Classroom and Laboratory in the spaces occupied by the x-ray darkroom, and the geochemistry laboratory. The grant provided funds to replace and upgrade the equipment for geological and atmospheric science analysis including:

- New x-ray powder diffractometer system
- Upgrade of the x-ray fluorescence system's software, standards and computer
- ICP-mass spectrometer system
- Gaseous ammonia analyzer
- Gaseous nitrogen oxides analyzer
- Organic carbon analyzer
- Long and short term air sampler systems
- Mixer mill – sample pulverizer
- Trimble GPS systems and software
- Furnace and oven
- Centrifuges
- Remodeling to accommodate electrical and HVAC requirements

In October 2016, we were part of another award from the Roy J. Carver Charitable Trust, along with Biology, Chemistry & Biochemistry, Physics, and Science Education to upgrade laboratories in our LAC/General Education courses. Our part of this grant was almost \$60,000. This included funds for:

- 24 laptop computers and cart
- 15 passenger van
- Atmospheric science software
- Solar filters for telescopes
- LED Headlamps (with red lights)

These two grants will provide valuable equipment and opportunities for all of our students, from those in the introductory courses through majors involved in advanced research projects. We are very grateful for the generosity of the Roy J. Carver Charitable Trust and their support of education, and scientific research in the state of Iowa.



ON-LINE TOC-VCSH
(WATER MONITOR/ANALYZER
WITH AUTO SAMPLER)



**INDUCTIVELY COUPLED
PLASMA MASS SPECTROMETER**

HYDROLOGY NEWS

The environmental assessment of Bagmati River in Kathmanu, Nepal continued for the second year of sampling. So far three rounds of water and sediment sampling have been conducted as follows: Phase 1: summer (May - July, 2015); winter (Dec, 2015 - Jan, 2016), and Phase 2: summer (May - July, 2016). This past summer, ten (10) sites were sampled at Sundarijal (site 1), Jorpati (site 2), Tilganga (site 3), Shankamul (site 4), Thapathali (site 5), Teku (site 6), Kalimati (site 7), Balkhu (site 8), Sundarighat (site 9), and Chobar (site 10). See map at <http://www.uni.edu/hydrology/NepalMap.php?ws=4>. Site 1 marks the source area of the river and site 10 is at the point where the river exits the urban portion of the Kathmandu Valley. Water samples were analyzed for temperature, pH, total dissolved solids (TDS), conductivity, dissolved oxygen (DO), total suspended solids (TSS), turbidity, E. coli, total coliform, biochemical oxygen demand (BOD), nitrate, total phosphorus (TP), and chloride. Some of the parameters, like Temp., pH, DO, TDS and Conductivity were analyzed at the sites by using portable sensors. The rest of the parameters were analyzed at a professional lab (CEMAT Lab) in Kathmandu. Sediment samples were transported to the United States and were analyzed for metals in the Department of Earth & Environmental Sciences at UNI. The results show extremely deteriorated water quality condition in the Bagmati River. The average TDS value increases from 22 mg/L in Sundarijal (near source) to 402 mg/L near Kalimati further downstream (mid-town Kathmandu). Similarly, TSS increases from 40 mg/L to 275 mg/L, respectively. Although DO in the upper reaches (Sundarijal and Jorpati) were recorded between 6 and 7 mg/L, the values quickly drops below 2 mg/L in all sites in the city areas downstream. E.coli increases from 8,000 MPN/100 mL in Sundarijal to 231,000 MPN/100 mL in the Kalimati area. The high concentrations of E. coli and very low DO in the stream water along the urbanized section show influence of direct sewage disposal. Effect of agricultural activities in the river in terms of chemical pollution seems minimal as the dissolved nitrate and phosphate are within the acceptable limits. The direct impact of this degraded water quality condition has been on the aquatic animals and plants, and the people directly relying on the river for drinking, washing, and agricultural activities.

Dr. Mohammad Iqbal is serving as the project director, which is funded by the National Science Foundation. Dr. Tara Nidhi Bhattarai is helping with the field logistics in Nepal, and Dr. Chad Heinzel is supervising the sediment metal analysis at UNI. Two students from UNI (Sushil Tuladhar and Junu Shrestha) and two students from Tribhuvan University in Nepal (Nirmal Raia and Sunita Magar) are participating in this project. The following pictures show a considerable increase in turbidity of the river after a rain event as Nirmal and Sunita collect water samples.



STUDENT RESEARCH

**BLAIZE CABELL, RILEY MULLINS,
JOSEPH REINDERS, AARON SCHROEDER
and Dr. Chad Heinzel**

128th Annual Iowa Academy of Science
April 22 & 23, 2016 — Des Moines
*Preliminary Delineation of the Maquoketa
Quadrangle's Surficial Geology*

ELIZA ROSS and Dr. Chad Heinzel

Summer Undergraduate Research Symposium
July 29, 2016 — Seerley Hall, UNI
Surficial Geology of the Maquoketa Quadrangle

RILEY MULLINS and Dr. Xinhua Shen

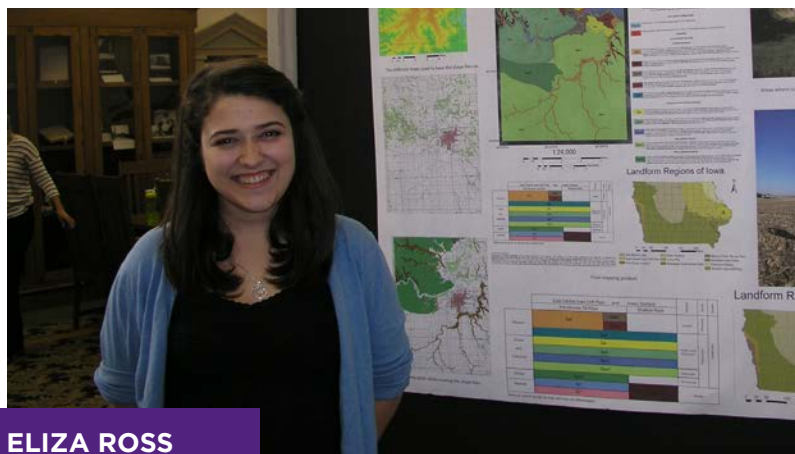
Summer Undergraduate Research Symposium
July 29, 2016 — Seerley Hall, UNI
Reducing Greenhouse Gas Emissions with
Advanced Nano-engineered Materials

KEITH DOORE and Dr. Siobahn Morgan

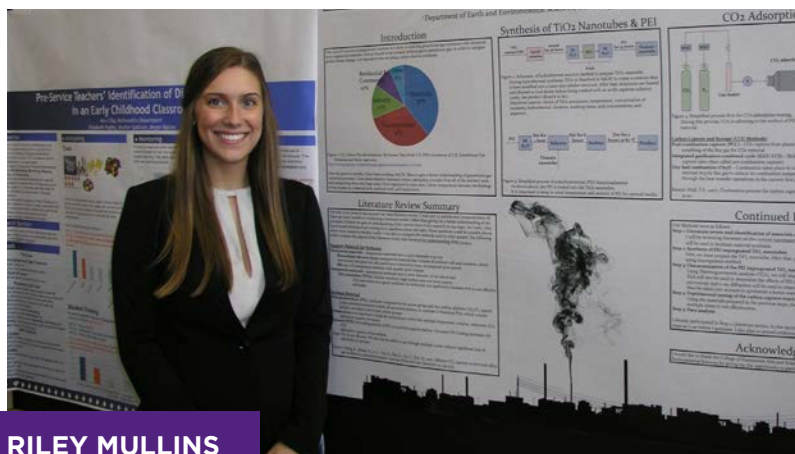
Summer Undergraduate Research Symposium
July 29, 2016 — Seerley Hall, UNI
Using Fourier Coefficients to Examine the
Metallicity of the Milky Way and Other Galaxies

**KEITH DOORE — AWARDED IOWA SPACE
GRANT CONSORTIUM AWARD**

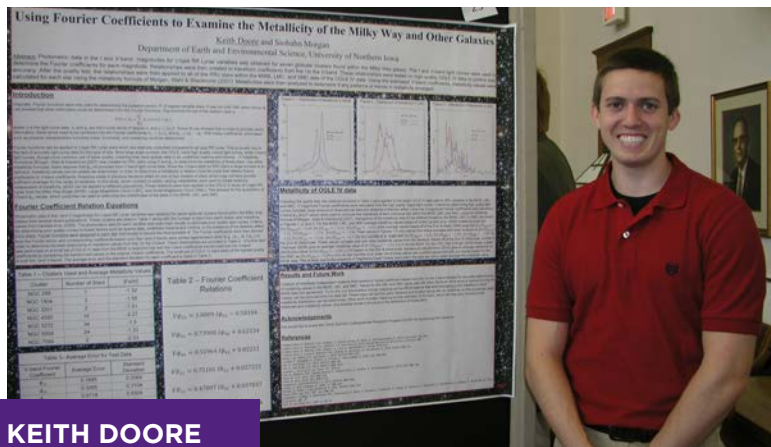
Keith Doore (Earth Science BA, Physics BS) obtained a SURP award for summer 2016 and followed that by receiving an Iowa Space Grant Consortium Award for the 2016-17 academic year. Keith has presented the preliminary results of his work at the Summer 2016 Undergraduate Research Conference (pictured at bottom right), and will be presenting a final version at the 2017 Iowa Academy of Sciences conference at UNI. His research project with Dr. Siobahn Morgan concerns the properties of pulsating stars in the direction of the center of the Milky Way galaxy. Keith is also employed as one of the observatory and planetarium assistants, and provides tutoring services in the Academic Learning Center. After graduation he plans on continuing his career as a graduate student in astronomy or astrophysics.



ELIZA ROSS



RILEY MULLINS



KEITH DOORE



DONOR SPOTLIGHT LESLIE KNAPP

The Earth and Environmental Sciences department has a great deal of thanks to give to donor, Leslie Knapp, for a gift to the UNI Foundation that will be distributed over three years and awarded to an environmental science major. Knapp has a passion of getting and keeping young women interested in science, which compelled her to make this donation.

"I donated to the Earth and Environmental Sciences department because I want to help students interested in the environmental sciences with their pursuits," said Knapp. "I believe that science and scientists have a lot to contribute to our future, and as a result it is important to help the next generation of scientists with their education."

Knapp has volunteered for science field trips and camps working with young women, and also volunteers as a tutor for a group of girls for the past four years. Since 1979, she has worked in the environmental consulting field and as a geologist doing material testing for construction projects. For most of her career, she has worked on hydrogeology investigations throughout the Midwest. Currently, Knapp leads a group of scientists working for an environmental consulting firm based in Minneapolis.

"I enjoy the challenge and variety of the work I do," said Knapp. "As a geologist, I have been able to enjoy an interesting career, but more importantly, geology has provided me with an understanding of the world around me. When travelling on vacation or looking at current events, geology makes everything more interesting."

GIFTS FROM ALUMNI & FRIENDS

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