



GLACIAL DEPOSITS

VOLUME 47 • DECEMBER 2022

Message from the chair

Greetings friends! I am thrilled to report that the past 12 months have been marked by much for us to be proud of.

The department welcomed its largest incoming student body in many years into our programs this fall, with 219 majors enrolled. We welcomed our newest faculty colleague, Dr. Daniel Kpienbaareh. Dr. Kpienbaareh is an environmental geographer with expertise in agroecology and geospatial technologies. Dr. Matthew Himley was promoted to professor, and Dr. Wondy Seyoum was tenured and promoted to associate professor. Matthew Huisman, a geology senior, was named University Bone Scholar and the Illinois State University Student Laureate Award from the Lincoln Academy of Illinois in recognition of his overall success as an engaged student, active citizen, and scholar. Dr. Eric Peterson was named Outstanding College Researcher.



This October, we hosted two esteemed alumni during Homecoming, Robert Kowalski (B.S. geography, 1991), assistant planning and development director for the City of Champaign, and Kate Krischke-Grobart (B.S. ESSE, 2007), an EPA award-winning 12th-grade teacher at Waukegan High School.

I must also share with sadness that the department said goodbye to several of its retired colleagues in 2022. Bill Shields passed away in April. Bill was an alum of our geology program (B.S. geology, 1999; M.S. hydrogeology, 2001). He taught over 20,000 students in his Principles of Geology class as a beloved teacher and student mentor. His legacy will continue through his Memorial Scholarship fund. In July, Professors Bill Walters and James R. Carter also left us. Bill was a human geographer who taught in our department for over 30 years until his retirement in 2002. Jim was a climatologist, cartographer, and member of our faculty for 15 years. He retired in 2005. All are remembered with great affection and will be missed.

I invite you to leaf through this volume of *Glacial Deposits* and read more about these developments, accomplishments, and other faculty, student, and alumni activities over the past year. I am sure you will appreciate the importance of the valuable support that we continue to receive from generous donors and friends like yourself. Your willingness to share your time, expertise, experiences, and monies means the world to us. These gifts continue to shape our successes and help propel us to new directions and heights of excellence.

Dagmar Budikova, Professor of Geography and Chair

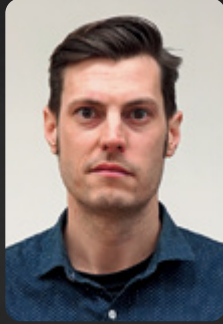
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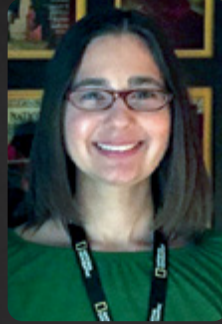
CURRENT *faculty*



Dr. Tenley Banik
Associate Professor of
Geology; Petrology,
Volcanology, Geochemistry



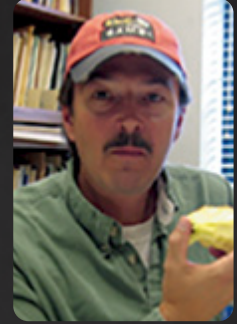
Adam Bauer
Instructional Assistant
Professor of Geography;
Research Ecologist CERL/
ERDC



Dr. Amy Bloom
Instructional Assistant
Professor of Geography;
IGA Co-Coordinator



Dr. Dagmar Budikova
Professor of Geography &
Chair, Climatology, GIS



Dr. James Day
Professor of Geology;
Paleontology,
Paleoecology,
Paleogeography



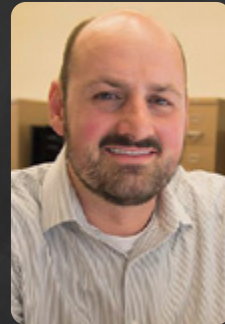
Dr. Alec Foster
Assistant Professor
of Geography; Urban
Environmental Change,
Urban Sustainability,
Environmental Justice



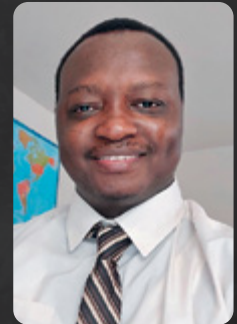
Dr. Melissa Hail
Assistant Professor of
Geography; Human
Geography, Urban
Geography, Urban Planning



Dr. Matt Himley
Professor of Geography;
Nature-Society, Political
Ecology, Latin America



Dr. John Kostelnick
Professor of Geography;
GIScience, Cartography,
GEOMAP Director, IGA
Coordinator



Dr. Daniel Kpienbaareh
Assistant Professor of
Geography; GIS/Remote
Sensing Applications,
Natural Resource
Management, Sustainable
Agriculture, Sub-Saharan
Africa



Dr. David Malone
Distinguished Professor
of Geology; Structure,
Stratigraphy, 3-D Mapping



Dr. Catherine O'Reilly
Professor of Geology;
Biogeochemistry, Water
Quality, Hydrogeology



Dr. Reecia Orzeck
Associate Professor of
Geography; Political
Economy, Historical and
Social Geography,
Middle East



Dr. Eric Peterson
University Professor of
Geology; Hydrogeology,
Karst Hydrology



Dr. RJ Rowley
Professor of Geography;
Sense of Place, Cultural
Geography, Internship
Coordinator



Dr. Wondwosen Seyoum
Associate Professor of
Geology; Hydrogeology,
Remote Sensing,
Hydrologic Modeling



Dr. Aondover Tarhule
Professor of Geography,
Vice President for
Academic Affairs
and Provost



Dr. Jonathan Thayn
Professor of Geography;
Landscape Ecosystem
Function Modeling, Remote
Sensing, Latin America



Dr. Lisa Tranel
Associate Professor of
Geology; Geomorphology,
GIS Applications

CURRENT *staff*



Karen Dunton
Administrative Aide



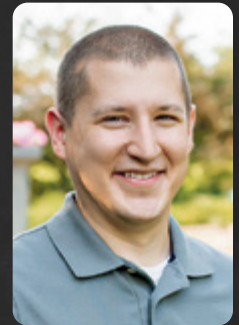
Barbara Fiest
Civil Service Extra Help



Ryan Lange
GIS Technician, Outreach
Coordinator, Instructor:
GIS, Drones



Paul Meister
Coordinator of Academic
Services in Geology,
GEO 102 Instructor



Russell Piontek
LEA Laboratory
Coordinator



Laura Roethle
Accounting Officer



Jill Thomas
Geography &
Environmental Science
Advisor, Geography
Education Coordinator,
Geography Lecturer



Dr. Tenley Banik awarded NSF grant to study subglacial volcanism in Iceland

Associate Professor of Geology Dr. Tenley Banik received a more than \$200,000 grant from the National Science Foundation to study subglacial silicic magma systems at Vatnajökull, Iceland, to better understand Iceland's crustal construction processes and glacio-volcanic hazard potential.

Banik—along with a collaborator at Lafayette College in Easton, Pennsylvania, who was awarded a similar budget, and their students—will reconstruct magmatic histories (with relevance for anticipating future behavior) using geochemical data obtained from minerals and rocks from the highly active Grímsvötn, Barðarbunga, and Kverkfjöll volcanic systems that lie under Iceland's largest ice cap. Silicic magmas generated at these subglacial volcanoes may be ca-

pable of eruptions even more hazardous than recent eruptions of basaltic magma. Additionally, there are indications that glacial unloading impacts the stability of shallow-crustal magma bodies and generates new melting, leading to increased eruption rates. As climate continues to change and Iceland's icecaps continue to thin, there is increasing concern about the impacts on subglacial volcanic systems and resulting hazards.

Over the course of three years, Banik and her research students will travel to Iceland to characterize rocks in the field and collect samples they can bring back and examine further in labs at Illinois State, Lafayette College, the University of Wisconsin, Washington State University, and Stanford University. They also work with Icelandic

collaborators who provide invaluable on-the-ground support and insight.

In August, Illinois State student Lauren Driggs joined Banik and the Lafayette team in the field for two weeks of sampling, exploring, and observing a wide range of geologic phenomena, including visiting the actively erupting Fagradalsfjall volcano. After spending a week processing the samples at the Lafayette lab, Driggs now awaits whole rock data and will help to collect zircon-based data later this year to start to understand the magmatic evolution of the sampled systems. Stay tuned to *Glacial Deposits* for further updates or check out Banik's website (tjbgco.weebly.com) for recent developments.



Lauren Driggs at Fagradalsfjall.



Dr. Tenley Banik, left, and Lauren Driggs, third from left, and the Lafayette team.



Lauren Driggs, left, and her Lafayette student counterpart at a sampling site.



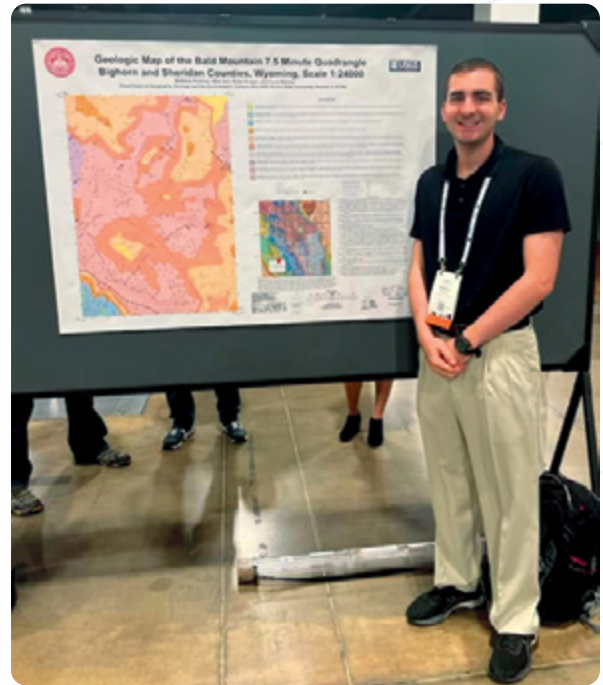
A beautiful day for fieldwork at Kverkfjöll.

Geology Bone Scholar—Matthew Huisman

Matthew Huisman is the Geology program's latest Bone Scholar, joining past recipients Aidan Kreiger, Jackie Epperson, Joe Syzdek, Simone Runyon, and Julia Ferguson. The Bone Scholarship, the highest university-wide distinction given to undergraduate students, honors the late Robert G. Bone, president of Illinois State University from 1956 to 1967. Bone Scholars participate in a rigorous campus-wide competition based on scholarly achievements as well as engagement and leadership in activities in the university community and beyond.

Huisman is a native of Chatsworth. His sky-high ambition prompted him to pursue a career in the U.S. Army as a helicopter pilot. Huisman is currently serving in the National Guard in addition to being a contracted cadet in Illinois State's ROTC program where he has taken on a variety of roles, includ-

ing first sergeant. When his head is not in the clouds, Huisman is grounded by his love for geology, having been involved in research with geologic mapping, carbon sequestration in the Illinois Basin, and zircon geochronology alongside Dr. Dave Malone. After graduation, Huisman will pursue graduate-level studies in geology while simultaneously serving his country as an army officer and helicopter pilot.



Outstanding College Researcher—Dr. Eric W. Peterson

The Department of Geography, Geology, and the Environment is proud to announce that Professor of Geology, Dr. Eric Peterson, was named the Outstanding College Researcher for the College of Arts and Sciences (2022-2023).

A common theme across Peterson's research efforts is the movement of water between surface reservoirs and subsurface (groundwater) reservoirs. Understanding of these movements is essential for the delineation of resources, water use planning, hazard assessment, and determining how natural processes remediate deleterious effects. His principal scholarly accomplishments have been focused on developing a better comprehension of the transport and fate of solutes, primarily nitrate and chloride, in different hydrologic systems, specifically fluvial-karst and glacial-fluvial. Research of karst systems has focused on the development of multiple cave levels in eastern Kentucky and the use of thermal energy to understand flow patterns in Arkansas.

Nutrient-reduction practices have become another facet of his research. In collaboration with the City of Bloom-

ington, Peterson's research group has been investigating the role of wetlands and of saturated buffer zones (SBZs) to reduce nutrients in tile-drained waters. Both systems have proved to be a viable means of decreasing nutrient loads within agricultural waters. Documented reductions of nitrate have been linked to plant utilization and denitrification within the soils of the SBZ. This nutrient reduction research has direct application to enhancing the water quality of surface waters in agricultural areas. While the work is designed to help the City of Bloomington improve the drinking water quality, the results show the importance of SBZ and wetlands to improve the water quality in agricultural areas.

Anthropogenic chloride contamination of freshwaters in areas receiving snow has been well-documented. Peterson and his students have documented elevated chloride concentrations in surface streams draining urban areas and have predicted that concentrations will remain elevated as the storage of chloride in the system has increased concomitant with the increased application of road

salt. Recent work has been addressing the role of agricultural practices. While the contribution of chloride from agriculture has not been quantified, he and his group have confirmed agriculture as a source for elevated concentrations of chloride in groundwater of non-urban areas.

Students play an integral role in his research. Peterson has chaired the thesis committees of 48 hydrogeology master's students and served on the committee of an additional 50 graduate students. Additionally, he has mentored 15 undergraduate students in research. Peterson views his research and teaching as a symbiotic endeavor, as he is teaching (mentoring) students, the students challenge him and force him to defend or reevaluate his ideas. All his mentees have found employment in the field of geology; and 10 graduate and two undergraduate mentees have continued in academia, either earning or are in the process of earning their Ph.D.s. One of his greatest points of pride is that all the 52 academic papers he has published while at Illinois State have at least one student co-author.

FACULTY SPOTLIGHT

DR. MELISSA HEIL

Dr. Melissa Heil is an urban geographer who studies cities of the American Rust Belt. Her research has focused on urban planning, economic development, social services, and community development in cities like Detroit and Flint, Michigan. She holds a Ph.D. and Master of Arts in geography from the University of Illinois at Urbana-Champaign and a Bachelor of Arts from the University of Michigan Ann Arbor. Before entering academia, Heil worked in community development and management consulting.

Heil's most recent research examines urban water systems and barriers to water access in U.S. cities. The United States is often thought of as a place with universal access to water for drinking and household use. Yet, many barriers to access exist in communities throughout the country, such as poor water quality or unaffordable water. In Detroit, where thousands of household water service disconnections have been performed over the past eight years for unpaid bills, Heil's research has studied how activists use practices of counter-accounting to advocate for new, affordable billing practices that would better safeguard low-income households' access to water.

Another recent project in Flint, Michigan, examined barriers to access in Flint's emergency water infrastructure which has supplied residents with bottled water since 2015. This project found a need for emergency preparedness guidance for American cities to have more robust standards for the accessibility of water distribution sites to ensure that these sites are usable for people without automobiles, disabled populations, undocumented immigrants, and other marginalized populations.

Heil has worked with students to study variations in water billing and disconnection policy in Central Illinois and throughout the United States. Students have collected and mapped variations in

overdue fees, service reconnection fees, and time-to-disconnection policies in various cities in Central Illinois and across the U.S. Mapping these factors enables Heil and her students to analyze which cities have the strictest water billing practices, practices that may lead to more water service disconnections when bills are unaffordable. Using census data, the research team is also analyzing which populations (e.g., along class, race, ethnicity), experience the harshest billing and disconnection policies in U.S. cities.



Heil teaches several undergraduate courses, including human geography, urban geography, and urban and regional planning. Across her classes, Heil emphasizes real-world applications of course ideas. Students in her urban geography class, for example, research how course concepts are visible on the landscape of a city of their choosing. Students in her urban and regional planning class work directly with real-world planning documents (e.g., master plans, zoning codes) and build professional skills (meeting facilitation, collaboration, group work, etc.) through projects that apply planning history and theory to contemporary challenges. She is eager to support students pursuing careers related to urban studies and to grow the urban focus within Illinois State's geography program.

Welcome TO THE DEPARTMENT!



Daniel Kpienbaareh

Dr. Daniel Kpienbaareh is an assistant professor of geography in the Department of Geography, Geology, and the Environment. He is originally from Jirapa Duori in the Upper West region of Ghana.

Kpienbaareh holds a bachelor's degree in geography and rural development (with economics) from

the Kwame Nkrumah University of Science and Technology, Ghana (2011), a Master of Science degree in climate change science and policy from the University of Sussex, United Kingdom (2013), a Master of Science degree in GIS/remote sensing and cartography from the University of Akron (2017)

and a Ph.D. in geography from the University of Western Ontario in Canada (2021).

Kpienbaareh currently teaches Introduction to GIS and Earth's Dynamic Weather. He is an interdisciplinary researcher with interests in the application of geospatial techniques for exploring the impacts of human-environment interactions on socio-ecological systems and proffering locally relevant policy options for addressing challenges facing these systems. Specific research themes include natural resource management, sustainable agriculture (with a focus on agroecology and regenerative approaches), precision agriculture, food security, land change analysis, and environmental health. His research is primarily focused on the Global South, especially in sub-Saharan Africa, but he has plans of researching in the U.S.

Cox presents research on Icelandic hyaloclastites

By Dr. Tenley Banik

Recent graduate Riley Cox '22 had successful poster presentations at the Northeastern Section Geological Society of America meeting in Lancaster, Pennsylvania, in March, and the Illinois State University Symposium in April. His poster, "Investigation of Oxygen Isotopes in Icelandic Rocks to Uncover Rhyolite Forming Processes," showcased his one-and-a-half-year-long, COVID-disrupted research efforts to understand better the role that hyaloclastites—rocks resulting from deposits produced when volcanoes erupt under ice or into water—might play in producing Iceland's enigmatic rhyolites.

Due to their hydrous nature, hyaloclastites are more easily melted or assimilated into shallow crust magmas, thereby potentially being a notable contributor to silicic magmas. Cox, in collaboration with Dr. Justin Dodd at Northern Illinois University, obtained

oxygen isotope compositions ($\delta^{18}\text{O}$) for a subset of the more than 30 samples collected last summer in Iceland. Hyaloclastites potentially retain low $\delta^{18}\text{O}$ values due to the hydrous nature of their formation and alteration, and meteoric waters during glacial times have even lower $\delta^{18}\text{O}$ than is typical for Iceland during interglacials. In addition to providing a baseline for hyaloclastite compositions for rocks spanning approximately 3 million years in age across Iceland, Cox's data suggest little-to-no contribution of low- ^{18}O material to either the parent magma or from low- ^{18}O waters incorporated syn- or post-eruption. Additionally, surface hyaloclastites do not initially appear to be a contributor to low- ^{18}O silicic magmas.

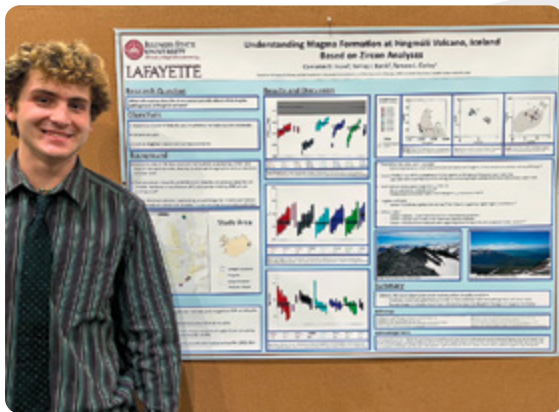


Over the next year we will strive to analyze the remainder of the samples to see if this trend holds and tackle several questions about why the observed compositions do not show the oxygen isotope trends expected for materials erupted during glacial times in Iceland. Cox is currently a graduate student in the Department of Earth, Atmosphere, and Environment at Northern Illinois University.

Student research project experience benefits from Powell Fund Contribution

By Cameron Essex

I had the opportunity to present my research at the regional Northeastern Geological Society of America meet-



ing and at the Illinois State University Research Symposium in spring 2022.

My poster showcased silicic magma formation at an extinct, famous volcano in eastern Iceland: Þingmúli. This volcano has long been a model for fractional crystallization in igneous systems,

so my advisor, Dr. Tenley Banik, and I were curious if our new zircon-based data corroborated those findings based on previously published whole rock data. No zircon data had been published from silicic rocks (dacites and rhyolites) at this volcano, so we conducted geochronology, trace element, and oxygen and hafnium isotope analysis (supported by Powell Fund monies) on zircon crystals from eight samples collected during our field work in summer 2021. Zircon U-Pb ratios indicate ages approximately 9-10 million years ago, which are the first ages for silicic rocks reported here. Oxygen isotope ($\delta^{18}\text{O}$) values in seven samples suggest silicic petrogenesis can be dominantly attributed to fractional crystallization

of mantle-derived basaltic magmas, which is in line with previous whole-rock-based findings. Hafnium isotope compositions are largely in line with expected regional trends. However, our data also hint at a warmer, early phase of magmatism in which incorporation of low- $\delta^{18}\text{O}$ material (perhaps by partial melting) was a significant contributor to the parent melt of the oldest sample's zircons.

Our data broadly support the established narrative of Þingmúli's petrogenesis but provide more nuance into certain aspects of the system's evolution. I am thankful to have conducted this project as my participation has strengthened my scientific and professional skills, and a manuscript for journal publication research is in progress. Currently, I am a graduate student in the Department of Geosciences at the University of Wisconsin-Milwaukee.

In Memory

It is with deep sadness that we must inform you of the passing of three of our dear colleagues who will be missed.

JAMES “JIM” R. CARTER

By Dagmar Budikova

Professor James R. Carter died in Midlothian, Virginia, on July 22, 2022. Jim is survived by his wife, Diane; two daughters and their spouses; four grandchildren; and one great-grandchild. Jim joined our faculty in 1993 as a professor of Geography with specialties in climatology and cartography. He remained an active scholar and member of the academic community until his passing.



Born in Sault St. Marie, Michigan, in 1936, Jim grew up in various regions of the Upper and Lower peninsulas and Kentucky areas. His university studies took him to Indiana University, where he earned his undergraduate degree in geology in 1958. He began graduate school in geography at the University of Maryland, College Park, where he received his master's degree in 1966. This journey was followed by the University of Georgia, where he earned his Ph.D. in climatology and cartography in 1973.

Beginning in 1972, Jim served on the geography faculty at the University of Tennessee in Knoxville. He joined Illinois State University in 1990 as the director of academic computing and a faculty member of our department. Jim retired as professor emeritus in 2005 after 15 years of service to the University. He and Diane continued to live in Bloomington until 2017, when they departed for Midlothian to be closer to his family.

Jim built an exceptionally active career in cartography and weather and climate studies. He served as a president, director, chair, and member of numerous professional organizations at local, national, and international levels, including the Association of American Geographers, American Meteorological Society, American Cartographic Association, American Congress on Surveying and Mapping, and American Society for Photogrammetry and Remote Sensing. Among his most influential was his service to the International Cartographic Association (ICA), where he was elected as chair of the U.S. National Committee (1988-92), the Map Use Commission (1995 and 1999), and the Map and Spatial Data Use Commission (1991-95). He regularly attended ICA conferences around the world and was well-known in the international cartographic community. Jim was a founding board member for the Illinois GIS Association (ILGISA) and served as president of the ILGISA between 1999 and 2000. Jim was a fellow of the American Congress on Surveying and Mapping.

Jim had an uncanny curiosity about the world around him. In one of his contributions to the *Journal of Geography* in 2008, he wrote about Dora the Explorer as the Preschool Geographic Educator. His long-time interest in ice flowers was sparked by observing ice growing on some plants in Jim's backyard in 2003. Jim became an expert on the topic of ice formation on plants, so much so that *Weatherwise* published his work on the topic in 2009 in a piece titled "Unusual Ice Formations: Studying the Natural Growths of Ice from Soils, Stems, Branches, and Rocks." A few years later, he also published "Flowers and Ribbons of Ice" in the *American Scientist* in 2013, which was subsequently reprinted by various presses around the world, including *Pour La Science* (2013), *Spektrum der Wissenschaft* (2014), and *Investigacion y Ciencia* (2014). Jim left his mark in the academy through various climate, cartography, and geographic education writings that appear in scholastic journals, books, and popular media outlets published over his 50-year academic career between 1972 and 2019.

While in our department, Jim taught several geography classes, including Geographic Tech-

niques, our then gateway class to the geography major, where one of his missions was to teach students basic skills of making proper choropleth maps. He also taught Conservation of Natural Resources and Earth's Dynamic Weather for several years. He was a generous colleague who allowed me to use his course materials when I arrived and taught the class. I remember that Jim had the class completely "online" in the first University student learning management system, WebCT, which helped him to teach the course to large masses. This approach was ahead of his time in the late 1990s and early 2000s! Jim helped develop the first curriculum of the Environmental Studies minor program. He was the Hydrogeology Graduate Program coordinator between 1996 and 2005 and mentored graduate students.

He was very active in the University and the broader community. He was a long-time member of the Senior Professionals Group at the University. Jim was a member of Rotary for over 30 years, first, the Normal Rotary Club, followed by the Huguenot Trail Rotary Club. Jim traveled extensively for both professional and personal pursuits. He was an active member of the Unitarian Church for over 50 years. Jim supported various environmental organizations and charities.

Jim is remembered with great affection by all of us who knew him. His spirited nature and warm, outgoing personality will be missed. He was a good mentor to new faculty as they arrived at Illinois State, always encouraging and eager to learn about their interests. I invite you to get to know Jim and his interests, including his work on ice flowers, through his own words at jrcarter.net. Jim was 85.

William "Bill" Shields

By David Malone

The Department of Geography, Geology and the Environment mourns the passing of our friend and colleague William "Bill" Shields.

Bill knew ISU as a student, staff member, and supportive alum. Bill lived most of his life in Oglesby. Before beginning college at Illinois Valley Community College in 1996 at the age of 36, Bill worked as a chef and as a lineman for the city of Oglesby. He completed his B.S. in geology at Illinois State in 1999, and after a brief stint at the Illinois Department of Transportation, he returned to Illinois State to complete his M.S. in hydrogeology in 2001. After completing his M.S., Bill joined our staff as an instructional support specialist and general education coordinator.



Most notably, Bill managed and taught Principles of Geology, a beginning natural science course in our then-new general education program. Bill's impact on this course was immediate and significant. Over the years, Bill served more than 20,000

students, mostly freshmen, in Principles of Geology. Bill was dedicated to his students and supported them in any capacity that he could. Their regard and admiration for him were returned 100-fold. There was rarely a day that his office wasn't full of students.

Bill was a principal recruiter of geology majors; these now graduates still sing his praises and are appreciative of the opportunities that he presented. During the summers, Bill was a fixture in the instruction of our annual capstone Field Geology course in Wyoming, which during his time here impacted nearly 500 budding geologists from dozens of colleges and universities.

Bill retired in 2016 and remained a regular visitor to the department, helping our geology majors and graduate students in research. Bill was impossible not to like. His stories are legendary, his laugh infectious, his kindness loved, and his enthusiasm unsurpassed. We are deeply saddened that the Illinois State community has lost a true rock star. Our prayers and condolences to his wife Laurie, son Ben, and stepdaughter Elena.

WILLIAM D. (DEAN) WALTERS, JR.

By Michael D. Sublett

Professor William D. Walters Jr., died on July 14, 2022, after a successful career of geographical scholarship, service, and teaching at Illinois State that ran from 1969 to 2001, plus more than two decades of robust retirement that included additional scholarship, more travel, and much family interaction. Bill leaves behind his wife and traveling companion, Karen Ann Walters; two sons, Eric and Matt; their wives; and four grandchildren.

Born October 25, 1942, in Detroit, Michigan, Bill grew up in suburban Royal Oak as a Tigers baseball fan but later switched his allegiance to the Chicago Cubs. He migrated to Kalamazoo and Western Michigan University where he intended to seek certification for a career as a history teacher but quickly found geography as an equally interesting and related discipline after enrolling during his first semester almost by chance in an introductory physical geography class. At Kalamazoo, he met Karen Ann Rennhack, from a family with farming roots in southwestern Michigan; and they hit it off. Karen, who studied at nearby Bronson School of Nursing, became an accomplished nurse and worked for many years at what was then Brokaw Hospital in Normal. They celebrated 50 years of marriage in 2015.

He had a thirst for more advanced education. So, following his *cum laude* graduation, with a B.A. double major in history and geography, they headed for Bloomington, Indiana, so that Bill could pursue the M.A. in geography at Indiana University. There he immersed himself in historical geography, eventually producing “Royal Policy and English Castle Distribution, 1154-1216” as his master’s thesis. Indiana kept Bill on as a doctoral student with a dissertation topic dealing with the diffusion of urban institutions in England from Roman to Tudor times. But, like a good number of his colleagues entering the professor ranks back then, Bill arrived at Illinois State in 1969 ABD (all but dissertation). He ultimately completed that task and became Dr. Walters in 1974.

Bill’s professorial career divides nicely, by decade, into three parts. From his appointment in 1969, through the 1970s, he was finding his niche; finishing his doctorate; establishing himself as a solid instructor (courses like earth science, world geography, and historical geography); collaborating with me and another professor on a project that led to our monograph, *Commentary on a Corn Belt Countryside*; beginning his efforts to place local structures on the National Register of Historic Places; and getting promoted very late in the decade to associate professor. In the 1980s, he solidified the scholarship side of his career with numerous published articles; affiliated with the Midwest Archaeological Research Center (at Illinois State), which led to several co-authored scientific reports; and received not one but three offers to serve as a journal editor, all of which he accepted and at which he excelled. Illinois State promoted him relatively quickly to professor in the middle of the 1980s. During the 1990s and his one year into the new millennium, Bill continued publishing, including his book *The Heart of the Cornbelt*, but really became a fixture on campus and in state circles on committees dealing with curriculum, especially general education. At one time or another he was a member of the Council on University Studies, the Foundations of Inquiry Committee, and a state committee dealing with better integration between Illinois colleges of social studies offerings. He also served on the College of Arts and Sciences Faculty Status Committee and in the Academic Senate.

After his retirement in 2001, he kept up his scholarly endeavors by becoming a Wikipedia author as he sought to bring the contents of his extensive notecard file on 19th-century Illinois town settlements to a broader audience. He further exposed the general public to what he had learned over the years with the publication in 2010 of his monograph *Selling Location: Illinois Town Advertisements, 1835-1837*.

Bill and I spent a lot of windshield time together motoring across the agricultural expanses of McLean and nearby counties during the early years of our careers. He was always good for a story about this crossroads or that barn, always eager to jump out on a whim to see something strange or grab a photo for his extensive slide collection. We will miss him. Bill Walters was 79.



Congratulations, GRADUATES!

Earth Space Science Teacher Education

Rebecca Knarr
Donna Korczak
Robert Lawrence
Daniel Scharlau Jr.
Katelyn Sculthorpe
Zachary Shugart

Environmental Systems Science and Sustainability

Allyse Barnowski
Mary Bonomo
Thomas Harlovic
Ashlyn McWilliams
Brittany Menzel
Emma Montana
Teresa Mullen
Karl Rosch
Veronica Schaidle
Sara Schelinski

Melody Schultz
Alyssa Siebers
Max Snyderman
Jarod Sparacio
Madison Steines
Evan Talbott-Swain
Daniel Trankina
Bridget Zak
Patrick Ziebell

Geography

Rachel Cantin
Joshua Cosby
Zachary Cranston
Joseph Giordano
Drake Hamm
Ryan Hogan
Steven Ihejirika
Richard Lapinski
Francesca Lewis
Matthew Martinson
Zachary Mueller

Alexander Olson
Eric Richmond
Alvaro Soriano
Derek Spitz
Jacob Stites
Trevor Suhr
Krystina Wayne

Geography Social Science Teacher Education

Eric Friestad
Evan Ihlenfeldt
Samantha Kupitz
Andrew Schmidt

Geology

William Becker
Connor Chambers
Riley Cox
Catherine Davids

Liam Eades
Cameron Essex
Aidan Krieger
Valerie Kurgan
Sarah Lesmann
Theodor Lowe
Tyler Mills
Alec Schroeder
Nicole Soder
Kyle True

Hydrogeology

Ashley DiVincenzo
Jerome Komas
Olaoluwa Oladuji
Jake Riedel
Alhassan Sahad
Cavien Satia
Michael Sell
Mujen Wang

Promoting Equality in the Sciences Scholarship promotes equity and justice

By Eileen Quinn

Established in 2020 by Joseph '99 and Shannon Fluder '00, the Promoting Equality in the Sciences Scholarship aims to support and promote an individual with a commitment to diversity and inclusion at Illinois State University. Junior social work major Daniela Martinez received the scholarship for fall 2022.

Martinez encounters diversity daily on her personal, professional, and educational paths. After becoming involved with Big Brothers Big Sisters of Central Illinois during her freshman year, Martinez found a sense of responsibility in becoming a trusted individual. She values the emphasis on community involvement within Illinois State's social work program. "Working with others from different populaces and backgrounds, sectors, and ages has really

improved my ability to communicate effectively," she said. "It has also shown me how important teamwork is."

Support from donors like the Fluders helped Martinez enhance her academic and professional experiences. Thanks to her scholarship, she was able to add a sociology minor, and she continues to explore university resources for students of all backgrounds. Martinez currently serves as vice president of the Association of Latinx American Students. She hopes to eventually pursue a master's degree in social work after her Illinois State graduation.

The Fluders take seriously their commitment to making the world a better place. "It can feel as though our hands are tied with many left wondering how to create or impact change around us. When we took our marriage



vows, we vowed to give back to issues we held near and dear to our hearts,” said Shannon Fluder.

“Giving back by creating an endowment that seeks to empower, uplift, and support individuals and/or communities who have faced oppression was something we felt we could do right now, to promote equality, inclusion, and diver-

sity. Our hearts fill with hope, gratitude, and joy every time we meet with students who are impacted by our endowment. There is no better feeling than supporting students who are paving the way for careers that seek to change the world for the better,” she added.

To qualify for the Promoting Equality in the Sciences Scholarship,

students must be majoring in a science-related field and prepare a personal statement of their experience with diversity and inclusion. The recipient is selected from a committee comprised of the dean of the College of Arts and Sciences, the assistant to the president for diversity and inclusion, and the director of the Multicultural Center.

A summer through the eyes of a geology major

By Grace Stevens

As geology majors, we found summer is not always the break we expected; but there is no better way to spend a summer than in the mountains. Soon after the end of the spring semester, about 20 geology students, including myself, traveled to Sheridan, Wyoming, for five weeks to complete Illinois State’s geology field camp.

We put in long days learning how to be efficient field geologists. We would start our days in the field around 8 a.m. and spend the day composing geologic maps of our project areas. To construct the maps, we had to observe and interpret the rock formations present, assign a color to them, and put that color at our location on the field maps. While that may sound like high-stakes coloring, there is much more to making a geologic map than putting a colored pencil to paper. We had to take measurements on the strike-and-dip of rock formations, identify faults and

faults, and include the proper symbols and data for those features on our maps. Once our field maps were complete, we would draft a final, presentable copy to be graded.

The skills we built at field camp were useful in the second half of my summer as well. A couple short weeks after completing field camp, a few of us went back out to Wyoming to work on an EDMAP. An EDMAP is a U.S. Geological Survey (USGS) sponsored research opportunity, which allows students to lead a mapping project in an approved quadrangle. Our quadrangle was in the Bighorn Mountains, including part of the Cloud Peak Wilderness. The biggest obstacle in our mapping area was not bears or weather; it was an abundance of cattle. With one dirt road providing access to the mapping area and grazing fields, we learned quickly that you have to share the road with the cattle; and they do not like to move.

The field portion of the EDMAP is finished, but we still have a lot to do with the digital map and sample analysis side of this project. To round out our summer of geology, we went straight from our EDMAP work in Wyoming to another, ongoing research project in Utah. The large-scale gravity slides in the Marysvale Volcanic Province of Utah are some of the largest on record and pose many questions for us to answer. One step in answering these questions is to collect samples of the rocks involved in the slide, get the zircon crystals out of these samples, and analyze them at the University of Arizona Laserchron Center in Tucson. Collecting samples was our main job in Utah, which involved a lot of hiking and flat tires, (including two flat tires at once).

Field geology is hard work, but when your office is a walk in the mountains, it is not hard to love what you do.

Summer grants offer Illinois State students immersive research experiences

By Kevin Bersett

Jake Brasen

Jake Brasen’s research project took him 1,300 miles from campus. In June, Brasen, along with faculty mentor Dr. Jonathan Thayn, professor of Geography, and fellow undergraduate student



Jake Brasen, Dr. Jonathan Thayn, and Karl Rosch at Corona Arch, which is located just south of Arches National Park, during their summer research trip to Utah.

Karl Rosch, spent two weeks in the high desert near Moab, Utah, tracking how well an introduced predator was killing off an invasive plant species.

Tamarisk, a small Mediterranean tree, had been planted in the U.S. in



Federal agencies are using a species of leaf beetle to kill the invasive tamarisk shrub in the Southwest.

the 1800s as a tool to fight erosion along the Colorado River in Arizona. The thick, thorny plant has since spread to over one million acres across the Southwest, choking out native plants

and the birds that live off of them, Thayne said.

“It grows very, very quickly, and it spreads quickly,” Thayne said. “When a limb falls off a tree for example, it falls into the river and can float down the river and stay viable for months. And then when it finally reaches shore, it will plant itself and start growing. So it very quickly is now the dominant vegetation on most rivers in the Southwest.”

About 15 years ago the National Park Service and federal Bureau of Land Management released a species of leaf beetle that only eats tamarisk. During their trip, the Illinois State researchers partnered with a retired United States Geological Survey entomologist to monitor the beetle’s effectiveness in beating back tamarisk along riverbanks near Arches and Canyonlands National Parks.

The group conducted field observations and took near-infrared images with a drone. They also rafted down the Green River and met with federal conservation officers who provided career advice to the students.

“I thought it was awesome and a great opportunity for me,” said Brasen, a senior from Lockport who is majoring in geography and minoring in environmental studies. “It was my first time really starting to work in environmental geography.”

Since the trip, the team has been organizing and analyzing the collected data. Thayne said the beetle is definitely making progress against tamarisk, but will never completely eradicate the invasive species.

“We’re confident that we’re going to get between 70 and 80% dieback, which turns into prime vegetative real estate in the desert being available now for new species, hopefully native species.”

Brasen said the research project has had a huge impact on him.

“The trip was a whole new experience for me,” Brasen said. “I got to actually see if I actually want to work in the environment and do environmental geography, and now I know I do.”

Brasen plans to present his findings at the University Research Symposium and a national geography conference, which will boost his resume and give him an opportunity to improve his public speaking. The team would also like to write a journal article about their findings.

Gracie Stevens

Gracie Stevens spent two weeks this summer examining some old rocks—really old rocks. Stevens was part of a team led by Dr. David Malone ’88, Distinguished Professor of Geology, that conducted research in north-central



Wyoming.

Stevens was participating in the U.S. Geological Survey’s EDMAP program, which provides students with hands-on opportunities to produce geological maps and do field geology. Her team was tasked with creating a 7.5-minute quadrangle map covering about 40 square miles in the Bighorn Mountains.

Stevens and her peers prepared field maps for their fieldwork and then spent their days hiking around the target area collecting data and rocks. “We would look at the rocks to know what rocks were where, what they looked like, and what they were and see if there were any



Gracie Stevens spent a couple of weeks creating a geological map and researching granite millions, and sometimes billions, of years old in the Bighorn Mountains.

faults or structural features,” said Stevens, a senior geology major from Land O’ Lakes, Wisconsin.

At the end of each day, the researchers put their findings onto a large paper map. Some of the rocks they collected were pieces of granite that are potentially 2.8 billion years old, which would place them among the oldest rocks in the U.S.

The students are now doing the multistep process of dating those rocks by extracting the mineral zircon and

sending that off to a laser lab in Arizona, which will allow for an analysis of uranium and lead decay. The team is also working to create a digital version of their map that will be sent to the Wyoming State Geological Survey.

“The research was just a really good experience,” said Stevens, “And it was so nice to have the (FIREbird) grant to support it.”

Stevens said the team plans to write a journal article about their granite findings and may present at next year’s

Geological Society of America annual meeting.

Stevens is looking into attending graduate school to pursue her interest in volcanology. She explained why the type of research she did this summer is important.

“Now more than ever, people are starting to focus on our planet. And to really understand it, you got to spend some time just reconnecting with it and analyzing little bits and pieces of it.”

Internship experiences

Eric Friestad

Hello everyone! I am Eric Friestad, and I graduated from Illinois State in the summer of 2022 upon completion of my GIS internship. I started as a history major, but later found room to add geography. It was a challenge to double major, but I am so glad that I did. I owe a lot to the Department of Geography, Geology, and the Environment for the wonderful experience I had and the



Eric Friestad gives the final presentation for his internship experience with Facilities Management.



Eric Friestad and the team he worked with out in the field, collecting tree locations and attributes on the Quad.

exposure they gave me to GIS.

Even though I had never heard of GIS before, it quickly became my passion. I am grateful for the opportunity I had to work for ISU’s Facilities Management where I contributed to GIS projects at various levels of completion. Starting from scratch, I met with stakeholders to begin a big project mapping the trees on campus; and I updated existing maps with elements such as building footprints, water fountains, and picnic tables. I worked on campus maps of emergency blue lights, automated external defibrillators (AEDs), and evacuation assembly areas, all of which can be viewed on the Safe Redbirds application.

I learned a lot from the experience, and I got to see the university from a different perspective, gaining in the process an appreciation for the work that happens behind the scenes and enables the school to continue delivering students the best experience possible. Illinois State helped me bridge the gap between being a student and experiencing the working world, and I can confidently say that the internship has set me on the right path to becoming a GIS professional.

Terry Thompson

My name is Terry Thompson, I am a senior geography and political science major at Illinois State University. Over the past summer I had the opportunity to intern for about two-and-a-half months with a nonprofit organization



called the Northwest Youth Corps through an AmeriCorps position. This was a conservation position that required me and five other people to travel all around the state of Washington to conduct mostly trail work: brushing trees, building draining tunnels as paths for rain, and maintaining the tread of trails. Washington, being the diverse landscape that it is, allowed me to work in all types of geographical locations.

Such experiences were in the semi-desert areas of the east, the lush forests of the central Cascades, and along the coast near the border of Oregon.

This experience came with a lot of highs and a few lows for sure. The highs were being able to live in such a beautiful region of the United States. Living in the Midwest, we really do not have as

many opportunities to see such beautiful landscapes. Washington is, by far, among the most jaw dropping places I have ever been. With that came one of the lows of the experience—the conditions. Living in a tent was hard, as it got very cold and wet relatively often, so this was challenging to live through. The other hard part was the mosquito presence. Since it was the summer, a lot of the snow was melting in the mountains with runoff settling in the valleys where we worked. Mosquitos loved to congregate around there, which made for some unpleasant experiences as they were ruthless in their attacks. Regardless, I always told myself to just appreciate where I was.

Going forward I hope to use what I learned in this experience to educate future generations in environmental stewardship. There is not a more important time than right now to understand the world around us, and in turn, to protect it.

Read [Illinois State student research shows abundance of in-town wildlife](#) by Connor Wood, *The Pantagraph*.



Geography student wins ILGISA Outstanding Student Award

Rachel Cantin is the Illinois GIS Association 2022 Outstanding Student Award winner. ILGISA is a statewide organization of GIS and geospatial professionals. Cantin won the award as a result of her exemplary performance during her Summer 2022 GIS internship with the City of Naperville.

‘Thirsty Society’: Interdisciplinary course delves into the study of water

By Ela Messina

The Center for a Sustainable Water Future was created in 2018 to fulfill three main goals: research and scholarship, civic engagement and outreach, and curriculum. Through the introduction of a new, co-taught class, the center is satisfying its curriculum goal and offering a holistic view of water’s roles across society.

“From economics to food systems, to public health, policy, engineering, and technology—water is everywhere. This class helps students understand the centrality of water in their lives and their future,” said Dr. Joan Brehm, a professor in and the chair of the Department of Sociology and Anthropology.

“Thirsty Society: An Interdisciplinary Examination of Water” integrates information from the natural and social sciences to create a unified understand-

Geography Scholarships and Awards

Eunice Blackburn Geography Capstone Scholarship

Evan Ihlenfeldt
Terry Thompson

Joseph Fluder Excellence in Geography Award

Axel Baumeister
Liv Durica

George Means Geography Scholarship

Matthew Genard
Drake Hamm
Eric Richmond

Henry O. Lathrop and A. W. Watterson Award

Lauren Christians
Celeste Saul
Derek Spitz

Margaret Means Geography Scholarship

Joseph Giordano
Jacob Sweeney

Louis Miglio Scholarship

Josh Campion
Jena Hassert
Delaney Houk
Evan Ihlenfeldt
Donna Korczak
Rhiannon Seaborg

Environmental Systems Science and Sustainability Scholarships and Awards

ESSS Achievement Award

Lacey Fever
Ryan Krakowiak
Emma Montana
Evan Talbot-Swann

Joseph Fluder Excellence in Environment Award

Jennifer Adcock
Thomas Harlovic
Blair Krickl
Ashlyn McWilliams

ILGISA Outstanding Student Award

Rachel Cantin



Drs. Eric Peterson and Joan Brehm are co-teaching a new course developed by the Center for a Sustainable Water Future.

ing of the societal roles of water. Brehm, who is also the co-director of the Center for a Sustainable Water Future, is teaching the 100-level course alongside Dr. Eric Peterson, University Professor in the Department of Geography, Geology, and the Environment and coordinator of the hydrogeology program.

Planning for the course and the incorporation of the dual-professor model began a year and a half before the pair began co-teaching in spring 2021.

“Solving the problems of water requires an understanding of everything from the science of water quality all the way through to the policy impacts and social implications,” Brehm said. “We had to do some convincing, but I’m very grateful for the fact that we had support from department chairs and college deans that saw the value in this kind of approach.”

Both professors are present during class sessions. In lectures and discus-

sions, Brehm covers the social-science content, touching on topics like public policy and access and equity, while Peterson handles the natural science side, focusing on water quality and the impacts of weather and climate.

“We also work to integrate small group discussions so students can sit back and think about what we’ve talked about,” Peterson said. “Whether or not the discussions get really deep, that’s not necessarily a requirement as much as thinking and talking about class topics and being engaged. That’s where curiosity gets built and where they start to see some of the real-world connections.

“(Students) want to make the world a better place and, ideally, they’re getting a better understanding of how that can happen through this course.”

Dan Frederick, a sophomore sociology major double-minoring in water sustainability and peace and conflict resolution, appreciates that the class promotes immersion into course content.

“I’ve never been a big science guy, but it’s been really interesting to hear both sides of the story,” Frederick said. “If you’re not really interested in the science part, you still get a little taste of what the social part looks like, and if you’re not really a social science person and you just want natural science, it’s there as well.”

Frederick’s enrollment in the course motivated him to add the water sustainability minor.

Demonstration and application are the core focuses of the professors’

teaching efforts. At the end of the course, students conduct an investigative study of a current water issue in society. Working to identify and solve a problem provides an opportunity to put all the information learned over the course of the semester to use.

As the class continues to evolve, the pair hopes to utilize other resources to make class sessions interactive.

“One of our future goals would be to add some field experiences to the class,” Brehm said. “Where we could actually take the students and go out and look at Sugar Creek and do some assessment of water quality, or maybe go to the water treatment facility at the south end of town and talk about what’s happening there. Getting at least a couple of field experiences into this class will really help elevate the understanding for students and the application of this content.”

As their second semester teaching the course comes to a close, Peterson and Brehm are able to reflect on what their teaching style and the course content can do for their students.

“Students are all coming in with a concern with the environment,” Peterson said. “They may not totally understand how everything is related, but they have a strong passion for environmental studies and how they can improve the environment. They want to make the world a better place and, ideally, they’re getting a better understanding of how that can happen through this course.”

O’Reilly receives NSF appointment

Professor of Geology Professor Dr. Catherine O’Reilly is participating in a rotation as a National Science Foundation Program Officer. “Rotators” have a temporary position at NSF, doing everything that permanent program officers do.

Program officers (POs) help manage the review process for proposals that are submitted to NSF in the hopes of getting funding. This management includes getting expert reviewers for proposals, putting together a panel of outside scientists to discuss the propos-

als, checking for conflicts of interest, leading panel discussions, and helping decide which proposals to fund. POs get to chat with scientists who are looking for feedback on proposals they have submitted or are thinking about submitting, thus helping them figure out how to tackle proposal-writing. Funding from NSF is very competitive. POs also work on special programs that can span multiple directorates at NSF, and they provide input into potential future directions. O’Reilly was hired into the Division of Environmental Biology, but

she is also interacting with colleagues in programs in other divisions, including the Division of Hydrological Sciences.

The rotating program officer program is an important part of how NSF works. These visiting scientists bring their disciplinary expertise and diverse perspectives from being “on the ground” to NSF. NSF values these fresh perspectives, both personal (gender identity, race, ethnicity, disability, career stage) and institutional (small college, primary undergraduate institutions). Many programs have about as many rotators as

they have permanent staff. Serving as a rotating program director is considered national service and is a way to give back to NSF and the broader community. It is also a great opportunity to mentor early-career scientists as they get started with reviewing and writing proposals.

Illinois State and the department also benefit from the time O'Reilly spends at NSF. Rotators return with a better understanding of the many pro-

grams for different types of grants and more insight into what it takes to write a successful proposal. NSF covers the rotator's salary, so the department can use what Illinois State normally would pay her to make sure all her courses are covered. O'Reilly is also able to keep doing research. NSF wants to make sure that program officers do not have to drop their research activities while they are working there, so 20% of their time can go toward continuing research. This

is less time than professors will normally allocate to research, which at Illinois State is 40% of their time, but hopefully enough to stay engaged and active in their various projects and in doing research with students. O'Reilly is looking forward to learning more about how NSF works and bringing that knowledge back to help out other faculty at Illinois State.

Kowalski, Krischke-Grobart recognized as Alumni Day honorees

By John Twork

Two Department of Geography, Geology, and the Environment alumni—Rob Kowalski '91 and Kate Krischke-Grobart '07—were honored by the department October 14, 2022, during Alumni Day.

"We are grateful to Rob and Kate for taking the time out of their busy schedules to visit our students and the department," said Dr. Dagmar Budikova, the department chair. "They make the world a better place through their exemplary professional accomplishments and contributions to our communities. We are very proud of them and value their continued friendship, support, and the thoughtful mentorship they offer our students."

Rob Kowalski

Rob Kowalski has always loved big cities, and as an undergraduate at Illinois State, his interest grew while enrolled in an urban studies class.

"It was the first time I heard of things like urban planning and that somebody actually had a job to think about how cities are designed," Kowalski



said. "I also loved the sociology aspect of geography—learning about different cultures and populations."

A 1991 geography alum, Kowalski is nearing three decades as a municipal planner. He has served as the assistant planning and development director for the City of Champaign since 2005. Kowalski helps develop the city's long-range vision, works in economic development, and administers zoning and land development rules. He has worked on enhancing Champaign's downtown, bringing new business to the community, and in the spring of 2022, he helped develop the city's first popup park, located in Champaign's Garden Hills neighborhood.

"This project has been one of the most rewarding projects that I've worked on in my career as a planner," Kowalski said. "The Garden Hills neighborhood is a historically underserved, predominantly African American neighborhood which also suffers from a lot of gun violence. There are also a lot of kids in the neighborhood which was built at a time when the city didn't require sidewalks, streetlights, or provisions for stormwater—so the streets flood in heavy rains."

Kowalski said the city obtained land in the neighborhood to build a detention basin. But before starting work on the basin, Kowalski and a team of workers built the Hedge POP! Park in just 100 days for \$75,000. It opened in June 2022, and the city organized programming at the park throughout the summer including remote control (RC) car racing, a weekly storytelling

hour, and chess lessons. Residents also enjoyed a half-court basketball court, turfed soccer area, and a field of blooming flowers. Kowalski volunteered at the park two nights a week.

"Being out in the neighborhood, getting to know people on a weekly basis has been particularly rewarding and beneficial to me as a person and as a planner," said Kowalski. He spoke about the Hedge POP! Park when he returned to campus in October 2022 to be honored during Alumni Day.

Kowalski said he learned valuable technical skills, such as computerized mapmaking at Illinois State. He is also grateful for the experience he gained through the capstone internship program led by Dr. Michael D. Sublett, professor emeritus of geography.

"I was absolutely blown away to come back and be honored during Alumni Day," Kowalski said. "I'm super proud to be an alum of ISU. I met my wife there in marching band. I have great memories. I loved it there."

Kate Krischke-Grobart

Kate Krischke-Grobart, a 2007 geology alum, is in her 14th year teaching environmental science at Waukegan High School—about one mile from Lake Michigan.

Through a collaboration with the Lake Forest Open Lands Association, Krischke-Grobart developed the Lake Michigan Literacy Curriculum in 2021 to teach her Advanced Placement (AP) environmental science students about the environmental, economic, and his-



torical significance of Lake Michigan.

“One of my big philosophies is if we’re going to be learning about the environment, we need to go to the environment and get outside as much as possible,” Krischke-Grobart said. “So, I wrote a field trip-based curriculum to get the kids out into the field, allowing them to have those one-on-one connections with the environment and environmental professionals.”

During the fall semester, students visited the lakefront and a restored ravine system, they observed water testing,

and they heard from geologists and former Environmental Protection Agency (EPA) managers about federal Superfund site cleanup projects. Krischke-Grobart connects the field trips with College Board objectives to prepare her students for the spring AP exam.

“I teach in a super urban environment, so lots of my kids—even though we live a mile away from Lake Michigan—most of them don’t have a connection with it at all,” Krischke-Grobart said. “And so, it is nice that they are starting to build a connection to literally their backyard environment.”

In recognition of her efforts to go “beyond textbook instruction to incorporate methods and materials that utilize creative experiences and enrich student learning,” Krischke-Grobart was one of 11 educators from across the U.S. to receive the 2022 Presidential Innovation Award for Environmental Educators.

“I am extremely humbled. The fact that I’m being recognized on a national level is very surreal,” Krischke-Grobart

said. “The best thing about the recognition is that it’s been opening more doors with different organizations and different groups wanting to help support my program. It’s wonderful because the benefits are going to go straight back to my students.”

Krischke-Grobart said she was also “humbled and honored” to be recognized by Illinois State’s Department of Geography, Geology, and the Environment during Alumni Day. Reflecting on her experience as a geology major, Krischke-Grobart said she was grateful for the personal relationships she developed with peers and faculty, including Distinguished Professor of Geology Dr. David Malone.

“Dr. Malone was the department head, and he was a mentor to me. I felt like I could go to him for anything and everything,” Krischke-Grobart said. “It was wonderful being able to travel with Illinois State and being able to have those experiential learning opportunities that we got out in the field. It was amazing.”

Geology Redbirds come through for annual Birds Give Back

By Dr. David Malone

Way to go GEO Redbirds! In February 2022, after learning of the woes of our shrinking instructional travel budget, we decided to participate in the annual Birds Give Back fundraising campaign. There we sought \$10,000 in gifts to support completely a new weeklong field trip that visits the Precambrian rocks of northern Wisconsin and the Upper Peninsula of Michigan (AKA the Lake Superior Field Trip).

We were the talk of campus that fateful late winter Thursday when more than 150 individuals made contributions that exceeded \$30,000. The only academic unit with more gifts was the School of Communication. To put this into perspective, they graduate as many students in a year as we have in 50. Geology has about a quarter of a percent of all living Illinois State alums, and we supplied more than 5% of the Birds Give Back gifts. Not only did we fully fund the Lake Superior Field Trip as hoped, but we were also able to help

support a new field camp scholarship and a scholarship to help recruit new freshmen and transfer students.

Twenty-four students took part in the five-day, four-night trip north, where we made 40 stops from Baraboo, Wisconsin, to Copper Harbor, Michigan. We stayed in Wausau, Wisconsin, and Iron Mountain, Houghton, and Silver City, Michigan. Because of your generosity, we were able to afford motels rather than campsites. Staying in motels equates to more time on the rocks (we worked 8 a.m.-7 p.m.), affords less hassle dealing with the cold and damp weather, and provides access to students who are uncom-

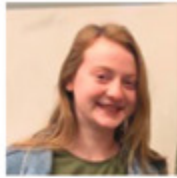
fortable or are not totally equipped to camp. **Up the mountain!**



Lecture on the provenance of the quartzite at Rib Mountain, Wisconsin

Every year, the Geology and Hydrogeology Programs present student awards that reflect the characteristics we value in our programs. These values include being engaged in department activities, helping each other, working hard, valuing teaching, and excelling in research.

2021–2022 Geology Award Winners



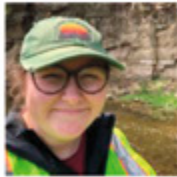
Trilobite Award: Lauren Driggs & Carly Johnson

To first-year students who have been trying hard and getting engaged in Geology activities.



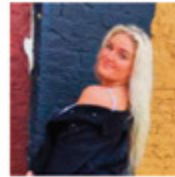
Gneiss Person: Gracie Stevens

Given to an undergraduate student who is engaged in department activities, helps other students, and is overall a nice and positive person.



Lathrup-Watterson Award: Lauren Christians & Celeste Saul

To second-year undergraduate students with outstanding academic achievement.



Granite UTA Award: Rhiannon Seaborg

Given to an undergraduate student who has excelled in teaching and mentoring students and supporting the mission of teaching at ISU.



Miglio Award: Donna Korczak & Rhiannon Seaborg

To support promising ESSE majors as they student-teach.



Titanium Award: Ryan Helgersen

Given to an undergraduate or graduate student who has a solid work ethic, is fully committed, and just keeps going.



Robert G. Bone Scholarship: Matthew Huisman

The highest academic honor an ISU undergraduate can receive for outstanding academic accomplishment, dedication to service, and leadership.



Gold Star Award: Joe Hoberg

Given to an undergraduate student who has been involved in high-level research activities, including presenting at a national conference.

Brad and Amber King Field Camp Awards

To help defray the cost of attending field camp for promising attendees.



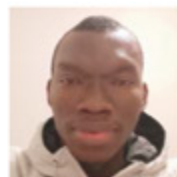
Above (L-R): Ben Bugno, Riley Cox, Joe Hoberg, Matthew Huisman
Left (L-R): Gavin Long, Colin Smith, Nicole Soder, Gracie Stevens

2021–2022 Hydrogeology Award Winners



Gneiss Person: Savannah Thielbar

Given to a student who is engaged in department activities, helps other students, and is overall a nice and positive person.



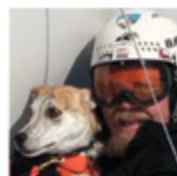
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Where the dinosaurs roamed: Dr. David Malone, son develop intriguing theory for how prehistoric rocks ended up in Wyoming

By John Moody

Dr. David Malone '88 is an expert on many topics, but dinosaurs are not among them. The Distinguished Professor of Geology's academic biography



points to his expertise in structural, sedimentary, and field geology. In other words, he knows an awful lot about rocks, sand, and the age and provenance of such things that date back millions upon millions of years.

"Nobody would call me a dinosaur expert, especially me," said Malone.

His son Josh is no dinosaur expert either. Nevertheless, Josh's inquisitiveness led the pair to question how some prehistoric rocks that David found in Wyoming had made their way from Wisconsin a long time ago. The pair concluded dinosaurs brought them. The Malones published their findings last spring in the geology journal *Terra Nova*. The article garnered national attention, including a writeup in *The New York Times*.

"I've done some really cool stuff, but I've mostly gotten interest from other scientists, this little realm of specialists," Malone said. "Plus, we've had a field camp capstone for our geology majors that we've been running for 50 years. Over the 29 years I have been involved, I have had the pleasure of working with almost 800 students from more than 50 universities. I've done a lot of creative science, hard science, but

I've never been picked up by *The New York Times* and other international publications. The word dinosaur is what did it."

Malone, who earned his bachelor's degree in geology from Illinois State, has been on faculty at his alma mater in the Department of Geography, Geology, and the Environment since 1994. He earned his master's degree and a Ph.D. at the University of Wisconsin.

During his tenure at Illinois State, he has been an associate professor, full professor, and department chair, and is now Distinguished Professor. He's also been named Outstanding University Teacher, Outstanding College Researcher, and Arts and Sciences Distinguished Lecturer. Funding for his work put him in the Million Dollar Club in 2008. He is a fellow of the Geological Society of America, which recognized his field camp with the Exxon-Mobil Field Camp Excellence Award.

In the following Q&A, Malone talks about how a "nice father-son project" has become an unexpected bonus to a career devoted to teaching and scientific inquiry.

You're a geologist, so how did you get interested in dinosaurs so late in your career?

By accident. In 2017, my son Josh was an undergraduate at Augustana (College) and was interning in the Bighorn Mountains in Wyoming. He was at a field station at the top of the mountains working as a camp hand hired to write social media stories. They were under 6 feet of snow at the first of June, so he couldn't take any photos or write any stories. He came and stayed with us near Sheridan and Cody, Wyoming, for a couple of weeks, hanging out with me and my students in Greybull, Wyoming. It's one of the field camps we go to in the Bighorn Basin near the Bighorn River. I had him come be our social media coordinator.

On the last day of each project I try to make myself scarce so students can finish their work. That's when I go around and pick up pretty rocks and fossils to give away as my calling card to teachers and students. The rocks were gastroliths, which are from dinosaurs' stomachs. We were collecting them because all teachers need something that's been in the stomach of a dinosaur. And, my son, like any good student, started grilling me on where they come from and how I could be sure that they came from dinosaurs. I like to see that kind of questioning from all my students. That was the beginning.

What exactly is a gastrolith?

They're stones that are smaller than your fist and found in dinosaur skeletons in their gastric mills, which are their gizzards. There are a couple of groups of dinosaurs that had gastroliths, but these likely came from the big, cow-like sauropods. They were plant eaters and would ingest gastroliths deliberately to help them with digestion of leaves that might contain sticks.

What's the significance of this particular site in Wyoming?

It's the Morrison Formation, which is Jurassic in age, meaning it's 150 million years old. It's famous for its dinosaur fossils. You can even find dinosaur coprolites (fossilized feces) there.

What was unusual about finding these rocks there?

These were red quartzites, ingested Precambrian quartzites, that only occur in a few places in North America. They're found midcontinent, which would be the Baraboo, Wisconsin, area. They can also be found in Arizona and in smaller amounts in Montana and Idaho. That means they came from a long way away.

I'm a sand expert. I could put you to sleep with my lectures, but I can tell



Dr. David Malone holds a gastrolith, a stone ingested by dinosaurs to help with digestion.

you about ancient geographies and when mountains wore away. We extended techniques that we use to determine the provenance of sand to dinosaur mobility. There's no sedimental logic—no explanation or evidence—for them being washed in by streams.

How is that possible?

I'm not an expert in dinosaur mobility, but I am an expert in sedimentary provenance and the ages of sandstones. The way you solve this problem is to look at the characteristics of the sand grains, particularly the mineral zircon sand grains.

In geology we need to find clocks—a uranium lead clock, for instance—to date something. We can figure out when it crystallized by using the mineral zircon. When a granite crystallizes, it crystallizes a bunch of minerals. Lead hates that crystal structure, and uranium decays the lead over time. If you can measure the concentrations of uranium and lead, then you can date it. For gastroliths, if you measure 50–100 zircons or more, you can get an array or a spectrum of ages, kind of like fingerprinting. With the age spectrum as the fingerprint, the rocks we were analyzing were all from the Devils Lake area

in Wisconsin. It's the first time anyone used this provenance technique to do something like this.

How do you explain how these rocks ended up in Wyoming 1,000 miles from southern Wisconsin?

The hypothesis being that they walked there in the belly of the beast.

Did you have expert help?

We did consult with other experts. We don't have a dinosaur expert on faculty at ISU, but the late Lauren Brown (Illinois State professor emeritus and expert in vertebrate zoology) helped us from the biology side and from the ecology of reptiles. Lauren said that dinosaurs could have made that trip in a month or so walking a couple of miles per hour, and they were following a river route and had food and water. He said they might have died, rotted, and floated down the river, but they carried gastroliths at some point.

Lauren was essential and had a lot of weekend chats with Josh to help. He was very generous, and he didn't get to see this published.

Does the work have skeptics?

I'll be interested to see how the next generation is going to use this, and I expect they'll be critical. A lot of paleontologists don't think these are gastroliths. Sedimentologically, however, all the evidence points away from their theory.

This generated a lot of media notoriety, what was that like?

First, it's important to note that this was my son's research. I helped him with data gathering and analysis, but this was done for his senior inquiry project. I remember getting off the phone after getting a call from The New York Times and saying, "That was The New York Times ... The New York Times, really?" One of our colleagues on the project was contacted not only by The New York Times but also by the Smithsonian.

Did this experience make a lasting impact on your son?

Well, yes, it did. Josh is now in a Ph.D. program at the University of Texas in geological sciences. He started out undergrad in landscape architecture and communications, and he's a great photographer so he was a social media manager for the football team at Augustana. The turning point was spending that time with us at camp watching what our students do. So he dropped his original plans and double majored in geology and geography.



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