EAS

EARTH AND ATMOSPHERIC SCIENCES

newsletter
FALL 2021

NOTE FROM THE CHAIR

In the 2020 newsletter the Department of Earth and Atmospheric Sciences had gone through a tremendous amount of change, and 2021 is no different except that the changes have been in a decidedly more positive direction.

The Bloomington campus relaxed its pandemic restrictions in two phases, with a mixture of in-person and online teaching in the Spring 2021 semester, followed by fully in-person teaching in Fall 2021.

Both campus and county have mask mandates that are likely to continue at least through this academic year, and the campus has a vaccine mandate.

While severe illness has been thankfully rare among department faculty, staff, and students, the pandemic has nevertheless been hard on everyone. Many members lost loved ones, cared for ill relatives, taught kids at home, or lived in near isolation for a long time. Faculty and students adjusted to on-line teaching and are still coping with disruption caused by frequent student absences. Staff struggled with stringent and sometimes confusing changes to policies on everything from travel to purchasing, exacerbated by a year-long hiring freeze that left many administrative offices severely understaffed.

While everyone suffered, I want to give special thanks to the department staff who made herculean efforts to keep the department moving despite facing challenges at the university and home. Research travel was postponed, often delaying completion of graduate degrees. Happily, these hardships are being peeled away month by month and we will start 2022 on firmer ground.

The department also moved back into a newly renovated Geological Sciences Building in phases. As you will see on the following pages, the new facilities are a great improvement. The building is brighter, has better climate control, has gathering places that it previously lacked, has purpose-built restrooms on all floors, and has increased capacity for research lab infrastructure.

Faculty, staff, and students moved into renovated offices in December 2020, followed by phased re-entry into research labs over the subsequent eight months. Two research labs were closed for nearly two years in total. A small amount of work remains to be done, ranging from minor touchup to a major electrical switchover.

The department owes a deep debt of gratitude to John Hettle, our building manager, who worked almost literally around the clock for two years keeping track of details and moving mountains, both figurative and literal, to ensure the renovation met as many needs as possible.

We welcomed two new faculty, Elizabeth Kenderes (Lecturer with expertise in igneous petrography) and Shelby Rader (Assistant Professor with expertise in trace metal geochemistry and mineralogy). At the time of writing, we are searching for an assistant professor in geophysics.

One faculty member, Bruce Douglas, retired since our last newsletter.

The IU Geological Field Station courses were taught in Montana as usual last year, thanks to the hard work of Jim Handschy and the instructional team. Mike Rygel of SUNY Potsdam, a long-term instructor, stepped in as Academic Director when Bruce Douglas retired. The group of IU Bloomington faculty teaching in Montana is growing, with Erika Elswick and Jim Handschy being joined by Brian Yanites, and Shelby Rader last summer.

The incoming graduate students from August 2020 made it through their first year with almost no in-person contact with the department, and were joined by a new cohort in 2021 as we moved back into the building.

Since the last newsletter, the graduate students have instituted EAGSA (Earth and Atmospheric Sciences Graduate Student Association) for communication, organizing activities, and interacting with the faculty. They have a five-member leadership council, each with a portfolio of activities. Many thanks to the leaders who served so far.

David Polly
Bloomington, Indiana
December 8, 2021

EAS

NEWSLETTER of the
DEPARTMENT OF
EARTH AND ATMOSPHERIC SCIENCES

Chair: David Polly
https://earth.indiana.edu/

College of **Arts + Sciences**
Executive Dean: Rick Van Kooten
Executive Director of Advancement: Travis Paulin
Director of Alumni Relations: Vanessa Cloe
https://college.indiana.edu/
Editors: Arndt Schimmelmann + Ruth Droppo

FACULTY

Simon Brassell	Professor
Doug Edmonds	Associate Professor
Erika Elswick	Senior Lecturer
Michael Hamburger	Professor
Jim Handschy	Professor of Practice
Ed Herrmann	Associate Research Scientist
Claudia Johnson	Professor
Kaj Johnson	Professor
Elizabeth Kenderes	Lecturer
Chanh Kieu	Associate Professor
Cody Kirkpatrick	Senior Lecturer
Ben Kravitz	Assistant Professor
Chusi Li	Senior Scientist
Jess Miller-Camp	Assistant Research Scientist
Jackson Njau	Associate Professor
Travis O'Brien	Assistant Professor
David Polly	Professor
Shelby Rader	Assistant Professor
Peter Sauer	Assistant Scientist
Juergen Schieber	Professor
Arndt Schimmelmann	Senior Scientist
Paul Staten	Associate Professor
Andrea Stevens Goddard	Assistant Professor
Brian Yanites	Associate Professor
Chen Zhu	Professor

EMERITI FACULTY

Abhijit Basu, David Bish, Jim Brophy, David Dilcher, Bruce Douglas, Enrique Merino, Gary Pavlis, Lisa Pratt, Ed Ripley, Lee Suttner, Bob Wintsch

POST-DOCS + RESEARCH ASSOCIATES

Alexander Charn	Post-Doctoral Research Fellow
Tyler Doane	Post-Doctoral Fellow
Paul Goddard	Post-Doctoral Fellow
Katherine Kravitz	Post-Doctoral Fellow
Huong Nguyen-Van	Fulbright Visiting Scholar
Jovanka Nikolic	Post-Doctoral Research Associate
Silvia Pineda-Munoz	Post-Doctoral Fellow
Olivia Thurston	Post-Doctoral Fellow
Zalmai Yawar	Post-Doctoral Research Associate

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Amanda McKinney	Program and Financial Coordinator
Bryan Roberts	Graduate Services Coordinator
Terry Stigall	Geophysics Technician
John Walker	IT Technical Specialist

GRADUATE STUDENTS

Sam Anderson	M.S. -	Jackson Njau
Sophie Black	M.S. -	Andrea Stevens Goddard
Allison Bormet	Ph.D. -	David Polly
Corey Brazell	M.Sc. -	Arndt Schimmelmann
Jack Brown	M.S. -	Doug Edmonds
Eric Burton	M.S. -	Doug Edmonds
Patrick Cavanagh	Ph.D. -	Lisa Pratt
Anupama Chandroth	Ph.D. -	Claudia C. Johnson
Etienne Chenevert	M.S. -	Doug Edmonds
Ping Chen (Evan) Chiang	M.S. -	Kaj Johnson
Clarke DeLisle	Ph.D. -	Brian Yanites
Kelsey Doiron	Ph.D. -	Simon Brassell
Jayson Eldridge	M.S. -	Ed Ripley
Ricardo Ely	Ph.D. -	David Polly
Caleb Fifer	M.S. -	Ed Ripley
Henry Z.M. Fulghum	M.S. -	David Polly
Jake Gearon	Ph.D. -	Doug Edmonds
Eduardo Gonzalez-Lugo	M.S. -	Brian Yanites
Kirsten Hawley	Ph.D. -	Claudia C. Johnson
Mohammad Rubaiat Islam	Ph.D. -	Travis O'Brien
Diya Kamnani	Ph.D. -	Travis O'Brien
Anne Kort	Ph.D. -	David Polly
Thomas LaBarge	M.S. -	Jackson Njau
Heather Lawson	Ph.D. -	Arndt Schimmelmann
Ya-Shien (Zax) Lin	Ph.D. -	Brian Yanites
Xuechang (Shay) Liu	Ph.D. -	Paul Staten
Sierra Lopezalles	Ph.D. Biology -	David Polly
Lan Luan	Ph.D. -	Paul Staten
Harrison Martin	Ph.D. -	Doug Edmonds
Allison Nelson	M.S. -	David Polly
Quan Nguyen	M.S. -	Chanh Kieu
Trung Nguyen	Ph.D. -	Ben Kravitz
Danielle Peltier	Ph.D. -	Ed Herrmann/Jackson Njau
Kwesi Quagraine	M.S. -	Travis O'Brien
James Ryan	Ph.D. -	Ben Kravitz
McKailey Sabaj	M.S. -	Chen Zhu
Charles Salcido	Ph.D. -	David Polly
Elizabeth Sherrill	Ph.D. -	Kaj Johnson
Caitlin Sifuentes	M.S. -	Doug Edmonds
Hrisikesh Sivanandan	Ph.D. -	Ben Kravitz
Samuel Smith	Ph.D. -	Paul Staten
The-Anh Vu	Ph.D. -	Chanh Kieu
Hao Yuan	Ph.D. -	Juergen Schieber

renovations

we're in our new home

The Geological Sciences Building is 183,514 gross square feet. The average home listed for sale in Monroe County October 2021 was ~1,645 sq. ft. So to provide a frame of reference let us say the building is equivalent to 112 homes. If you've experienced any scale of remodel in a home, or new home construction – imagine that times 112. More, really, given that commercial infrastructure is vastly more complex than residential. Still, you have an idea of the renovation's scope.

I'm also sure everyone has moved from one residence to another. Imagine moving 112 homes simultaneously.

> "I do not think it is unreasonable to say the building's original systems were less than ideal. Our new systems are an incredible improvement."

There were certainly frustrations along the way for everyone involved. Yet we persevered through the dedication and hard work of parties within IU and outside of IU, and we should focus on what we accomplished together: making our old home our new home.

The Geological Sciences Building has an interesting history, the recent renovation being the latest chapter. In keeping with tradition, it was an interesting chapter, one that we're still finalizing as we continue the process of putting our spaces back together.

I think it is important to remember the original scope of the renovation was a mechanical, electrical, and plumbing infrastructure upgrade only. That being said, many parties inside and outside of IU worked tirelessly to exceed that scope. We also must recognize our own personnel who put in an extreme amount of effort – and patience.

I do not think it is unreasonable to say the building's original systems were less than ideal. Our new systems are an incredible improvement. Moreover, the systems and certain updated features give us flexibility moving into the future. I'm confident that the building will be an incredible resource for us to not only pursue our research and teaching missions, but also to be a better home away from home. This is a place where we can not only work but enjoy showcasing and celebrating the accomplishments of those in our community.

We also have the opportunity to share what we do with those visiting the building. It should not be underestimated how much more inviting and accommodating the building is now to students and visitors.

We were in this building for over 55 years before the moves and construction started. I'm confident that, thanks to the renovation project, the building will serve us incredibly well. I have always enjoyed and appreciated our culture of "getting by with what we have." I am very thankful we now have better systems to serve our needs.

John Hettle, Facilities Administrator

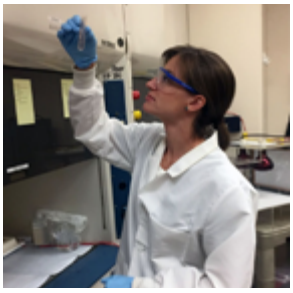
new faculty faces

ELIZABETH KENDERES

Dr. Kenderes is a Lecturer working in petrology, radiogenic isotopes, and mineral chemistry.

Her research interests include:
Geochemical links to tectonic development of western North America during the Mesozoic; Radiogenic isotope geochemistry of whole rock and mineral separates; Magma mixing and homogenization processes; Mineral crystallization controls on magma petrogenesis; Mineral exploration and petrologic and elemental analysis of gem-bearing pegmatites; Analysis of pegmatite forming fluids by fluid inclusion study.

SHELBY RADER



Dr. Shelby Rader is a trace metal geochemist who originally hails from Irvine, KY. Shelby attended the Gatton Academy and ultimately received her bachelor's degree in geology and chemistry from Western Kentucky University before obtaining her doctorate in geochemistry from the University of Arizona. Afterwards, Shelby completed a postdoctoral researcher position at the University of Massachusetts Lowell before moving to Indiana University. Through her research, Shelby is able to observe how large-scale geologic processes, both from the past and currently, alter the geochemistry of our environment, which ultimately impacts plant and animal life, our resources, and us. Dr. Rader recently accepted an offer for Assistant Professor in EAS.

ANDREA STEVENS GODDARD

Dr. Stevens Goddard combines fieldwork with analytical techniques such as thermochronology and geochronology to understand the timing and rates of Earth processes over geologic time. As a sedimentologist, she investigates these questions from a sedimentary basin's perspective, using information preserved in eroded material to interpret the geologic evolution of source areas.

Her recent work has focused on understanding the roles and potential feedbacks between climate and tectonics and lithospheric scale processes on erosion, sediment routing, and landscape evolution. Her research includes work understanding orogenic systems as well as the formation of intracratonic basins and their relationship with plate boundary processes. Dr. Stevens Goddard directs and manages the fission track lab at Indiana University.

new post-doc faces

ALEXANDER CHARN

Alex Charn is collaborating with Travis O'Brien on Rossby Wave Breaking and Atmospheric Rivers, and Coastal Climate Trend Downscaling. His Ph.D. was from UC Berkeley where he worked on extreme precipitation and lightning.

TYLER DOANE

I study the mechanics and probabilistic elements of sediment transport and landscape evolution with Dr. Brian Yanites and Dr. Doug Edmonds. My work at IU focuses on describing the relationships between forests and surface characteristics, hydrology, and channel networks.

Sediment transport is the primary mechanism that shapes hills and valleys. However, although it is ubiquitous actually watching sediment move about is rarely achieved at relevant scales. Using mathematical theory, numerical modeling, carefully designed experiments, and field work, I work to describe the underlying physics, statistics, and probability of processes that shape the world around us but often evade observation.

PAUL GODDARD

Dr. Paul Goddard is a Post-Doctoral Fellow working in climate modeling.

"My previous research focused on regional sea level rise, Antarctic shelf water warming, and West Antarctic precipitation using global climate models. At IU, I am using a mesoscale numerical weather prediction model (WRF) to understand the impact of marine sky brightening on radiative forcing and on regional to global weather and climate."

Before coming to IU, Paul used a combination of global climate model data and observations to research recent past, present, and future ocean circulation, ocean temperature, and atmospheric dynamics as they relate to global and regional sea level rise and climate change.

JOVANKA NIKOLIC

Jovanka is a Postdoctoral Research Associate in Dr. Kravitz's group, working on computational fluid dynamics simulations of wind plants to quantify uncertainty for wind energy. Before coming to IU, Jovanka used regional models to study fire-atmosphere interactions, land-atmosphere interactions, and effects of land use/land cover change on climate over the continental US.

HUONG NGUYEN-VAN

Dr. Huong Nguyen-Van was a Fulbright Visiting Scholar in Dr. Arndt Schimmelmann's laboratory this summer. His research title is Paleoclimatology of Holocene and Pleistocene sediment from Vietnamese lakes, including maars.

SILVIA PINEDA-MUNOZ

Human population has exponentially grown ever since the Last Glacial Maximum. This event has had tragic impacts in modern ecosystems, transformed the landscape and affected ecological interactions at all levels. Thus, pre-human habitat preferences may inform of the environmental conditions that can maximize a species' fitness. My goal is to advance conservation biology using ecological models that incorporate both modern and recent-past ecosystems.

OLIVIA THURSTON

Post-Doctoral Research Associate working with Andrea Stevens Goddard in the Thermochronology Lab.

I am using low-temperature thermochronology to explore erosion and transport rates of sediments from cratonic source rocks into intracratonic basins in North America.

ac-com-plish-ments

EAS Professor Emeritus David Bish Receives Clay Minerals Society's Highest Award. As a part of receiving this prestigious award, Prof. Bish will present next year at the Clay Minerals Society's 59th Annual Meeting, Istanbul, Turkey.

EAS Professor Simon Brassell has been elected a Fellow of the American Geophysical Union (AGU). This honor, bestowed on only 0.1 % of AGU's more than 60,000 members, was given to Simon for his "pioneering work on using molecular geochemistry for the study of ancient climates and the genesis of hydrocarbons."

EAS Professor Claudia Johnson named Herman B. Wells Professor.
The award is not only a well-deserved recognition of Professor Johnson's accomplishments, but it benefits the department to have been bestowed on one of our own faculty (not to mention the direct benefits we receive from Claudia's work over the years she has been here). Congratulations, Claudia, and thank you for all you do for the department and the university!

My research goals remain centered in studies of Mesozoic to modern reef ecosystem evolution, and in Pleistocene landscape evolution in the African Rift System at Olduvai Gorge, Tanzania.

I was delighted to be nominated for and named as Fellow of the Geological Society of America in 2019. More recently, I was deeply honored to receive the Class of 1948 Herman B Wells Endowed Professorship. With this professorship I have the privilege of carrying the Herman B Wells title for the duration of my IUB career, and the pleasure of striving for continued integration of students into our study of the history of life and our Earth.

I congratulate geobiology M.S. graduate Emily Thorpe and Ph.D. graduate Alex Zimmerman on their 2020 graduations and acknowledge each for their research contributions that progressed our understanding of reef system paleoecology. Ph.D. student Kirsten Hawley is in her 2nd year of the Ph.D program, double majoring in Earth Sciences and Anthropology, and Anupama Chandroth is completing her first year's research and classwork.

A generous financial contribution from an anonymous donor allows me to extend research internships to undergraduates interested in reefs, to assist in developing their skills in database development and analysis, and to more fully integrate these "modern" reef researchers with our geologists studying the rock record.

As Director of the Center for Biological Research Collections I'm pleased to announce that the completion of our building renovation allowed us to bring boxes of fossils back into our IU Paleontology Collection space on the 5th floor of Geology. Through generous contributions from the College and the Provost, we will be able to complete the unpacking process quickly and return to our goals of using these fossil collections, and those in the W.R. Adams Zooarchaeology Laboratory, to fulfill research goals of academics and student interns studying the evolutionary history of life.

Claudia C. Johnson

EAS Assistant Professor Ben Kravitz Named Top Climate Scientest by Reuters.
Quoting Reuters: "Even the coronavirus pandemic has laid bare the enormous challenges the scientists confront. Echoing divisive skirmishes over climate change, politics and science have done battle, as some governments appeared to dismiss or minimize established research on the virus' spread. And despite a drop of 7 % in emissions last year as the world ground almost to a halt, carbon dioxide levels continued to rise and are higher than at any point in human history. No year was hotter than 2020."

accomplishments

EAS Assistant Professor Travis O'Brien is working on a DOE project studying water resources.
Quoting News at IU Bloomington: "At a time when a drought is affecting the 40 million people who rely on the Colorado River system, Indiana University professor Travis O'Brien and a team of scientific colleagues are embarking on a monumental U.S. Department of Energy project to better predict the future of water availability in the West."

Professor Chen Zhu Named 2021 Darcy Lecturer
The Henry Darcy Distinguished Lecture Series in Groundwater Science fosters interest and excellence in groundwater science and technology. It was established in 1986 and named in in honor of Henry Darcy of France for his 1856 investigations that established the physical basis upon which groundwater hydrogeology has been studied ever since.

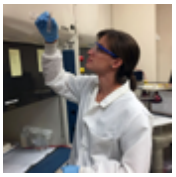
Each year, a panel of scientists and engineers invites an outstanding groundwater professional to share his or her work with their peers and students through this lecture series. The Darcy Lecture Series is most often presented at universities and professional associations throughout the world.

EAS Professor Chen Zhu spoke on the following three titles at participating venues in 2021:

"*Hydrogeochemistry: Advances in the Last 25 Years and Some Predictions for the Next 25 Years*"

"*The Nexus Between Water Resources and Geological Carbon Sequestration*"

"*Watershed Scale Hydrological Models as Community Platform for Research, Teaching, and Service to Society*"



EAS Senior Scientist Dr. Shelby Rader Promoted to Assistant Professor.
Dr. Shelby Rader has accepted our offer of an assistant professorship in Earth and Atmospheric Sciences. She will start in that role January 1. She has been part of our department for two years, teaching and working in the Metal Isotopes Lab.

EAS Graduate Student Jeff Valenza awarded NSF Postdoctoral Fellowship.
Jeff Valenza has been awarded an NSF Postdoctoral Fellowship. These postdocs allow the recipient to carry out their own work with a mentor of their choice, and can be split between US and international labs. Jeff will do exactly that to continue his work on fluvial processes including river avulsion events. He will work with Vamsi Ganti at UC Santa Barbara and Alex Whittaker at Imperial College.

EAS Graduate Student Clarke DeLisle receives OSP award from AGU

Clarke DeLisle, PhD student working in Brian Yanites' geomorphology group, received an Outstanding Student Presentation Award from the American Geophysical Union.

The award was for Clarke's virtual presentation at the December AGU conference titled Cascading Flood Hazard Following the 2009 Typhoon Morakot, Southern Taiwan. He found that large storms like the 2009 typhoon increase the probability of flooding for decades or longer after the storm, largely because of greater frequency of landslides that cause sediment aggradation.

EAS Graduate Student Elizabeth Sherrill's article featured in EOS

There's an exciting new EOS research spotlight article covering Elizabeth Sherrill's research on predicting the risk of earthquake activity.

It is based on Elizabeth's paper with Kaj Johnson from December in JGR Solid Earth titled "*New insights into the slip budget at Nankai: an iterative approach to estimate coseismic slip and afterslip*". They fit an inverse model to geodetic data of movements along a subduction zone beneath Japan associated with big earthquakes in 1944 and 1946, and then used it to produce a forward model that predicts the likelihood of future movements along fault lines (earthquakes) based on how much movement there has been in recent years. The same approach can be applied to tectonically active areas around the world to improve risk assessment and policy. Congratulations Elizabeth!

EAS Students awarded grants in the NASA FINESST (Future Investigators in NASA Earth and Space Science and Technology) competition.

FINESST is an annual NASA funding opportunity where graduate students act as "future investigators" and are functionally PIs on their own research proposals (draft the proposals, work with ORA to submit them, etc.). The applications are fairly intensive and time consuming (the solicitation document alone is 33 pages). It's technically a grant, not a fellowship, and so provides great experience for early career scientists. A successful applicant can request and receive up to $135,000 USD over three years in a research grant.

For this year's competition, NASA received 835 proposals, of which 130 were successful. More specifically to the NASA "Earth Science" Division, 351 proposals were received, and only 58 proposals were selected. Of those 58 proposals, three were from Earth science students here at IU:

- Harrison Martin with Dr. Doug Edmonds (EAS). The fellowship will support his stipend, tuition fees, travel, and publication fees for his project *"Testing the Hypothesis that River Discharge Variability Controls Megafan Formation in Foreland Basins."*
- Sam Smith with Dr. Paul Staten (EAS). *"Determining the Dynamical Drivers of Present and Future Changes in the Atmospheric Water Cycle."* Along with his advisor, Dr. Paul Staten, Sam will utilize satellite data to evaluate the latest generation of climate models (used for the IPCC's Sixth Assessment Report). Specifically, they will examine how well these models simulate the movement of moisture by continental-scale weather systems and the extreme rainfall that often results.
- Qing Chang with Dr. Kim Novick (SPEA). "*Incorporating Land-Atmosphere Feedbacks into Agricultural Drought Monitoring and Forecasting.*"

accomplishments

It was some great representation for IU!

EAS Senior undergraduate student Natalie Mattner received the Rudman-Pavlis Research Fellowship in Geophysics in 2021.

The fellowship is awarded annually to an undergraduate student with a strong interest in geophysics and comes with a financial award as well as hourly funds to support a research project guided by the geophysics faculty in EAS. Natalie has spent the last year working with Dr. Kaj Johnson on a project to extract tectonic signals from GPS time series data from southwest Japan. This work involves identifying transient deformation associated with earthquakes in the region, including transient motions following the huge magnitude-9 2011 Tohoku earthquake. Natalie plans to complete this research as a senior thesis and earn the Honors BS in Earth Science degree in May 2022.

EAS Undergraduate Students Elected to Phi Beta Kappa

Please join me in congratulating our students Sydni Rockwell and Dylan Seal on their election to Phi Beta Kappa. Phi Beta Kappa is the oldest academic honor society in the US, and is often described as its most prestigious one. Membership is by invitation only and is based on combination of grade point average, breadth and depth of study, and track record of achievement from high school to the present. It is quite an honor for Sydni and Dylan to be selected, and also for the department to have two new student members.

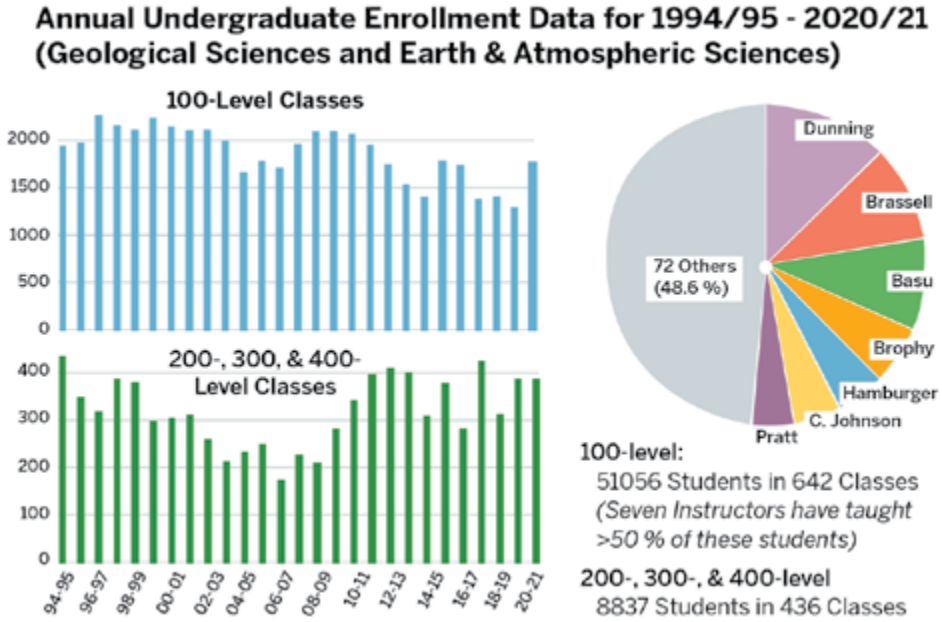
milestones:

27 years of undergraduate enrollments

Data for annual undergraduate enrollments (sum of fall, spring, and summer classes) in Geological Sciences and Earth and Atmospheric Sciences from fall 1994 through summer 2021.

Major Points:

- Total enrollments: 51,056 students in 642 100-level classes and 8,837 students in 463 200-, 300-, and 400-level classes; 59893 students in 1105 undergraduate classes.
- Total undergraduate enrollment = 85.2 % in 100-level classes, 14.8 % in 200-, 300-, and 400-level classes
- Seven instructors (Dunning: 6,457; Brassell: 4,964; Basu: 4,732; Brophy: 3,036; Hamburger: 2,499; C. Johnson: 2,482; Pratt: 2,084) have taught classes that account for 51.4 % of 100-level enrollments, with 72 other instructors teaching the other 48.6 %.
- Eight instructors (Dunning: 6,504; Brassell: 5,139; Basu: 4,732; Brophy: 4,264; C. Johnson: 3,173; Hamburger: 2,623; Douglas: 2,548; Pratt: 2,332) have taught classes that account for 52.3 % of all undergraduate enrollments (100-, 200-, 300- and 400-level classes), with 85 other instructors teaching the other 47.7 %.
- 100-level trends: There were lower 100-level enrollments in 2004/05-2006/07 than in previous years and a decline from 2011/12 to 2014/15, rebounding in 2015/16, 2016/17 and 2020/21. Similar numbers of classes (range 21-24) were taught in each year, so the trend is not directly related to the number of courses offered.
- 200-, 300-, and 400-level trends: The irregular, gradual decrease in enrollments by almost 60 % (433 to 175) from 1994/95 to 2006/07 was steadfastly reversed to a total enrollment over 400 from 2007/08 to 2012/13. More recently, annual enrollments have oscillated between lower (~300) and higher (~400) cumulative values.

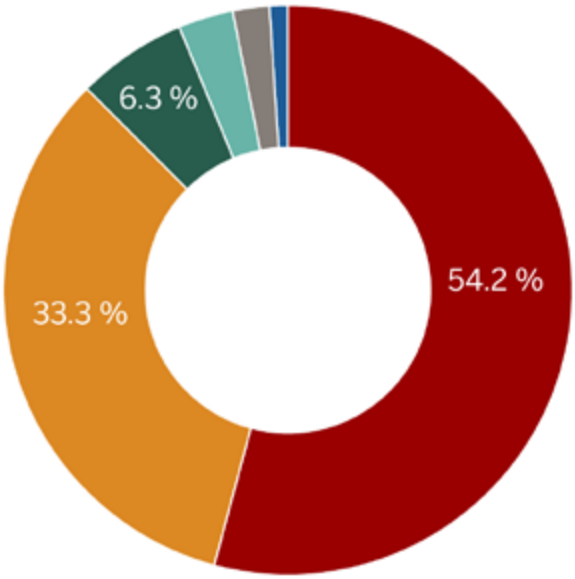


Rough draft of summary data showing departmental enrollments in 100-level classes since Fall 1994, which represents over 51000 students.

The histogram shows the annual enrollment over these years and the pie diagram reflects who taught these classes and students. Remarkably - or maybe it isn't so surprising – seven members of the faculty have taught over half these students, more that the other 72 other faculty and students combined over these years. Three of the seven – Michael, Claudia and Simon – are still teaching!

The focus is on 100-level classes because the enrollment in these class is ~5 times that in all other UG classes combined.

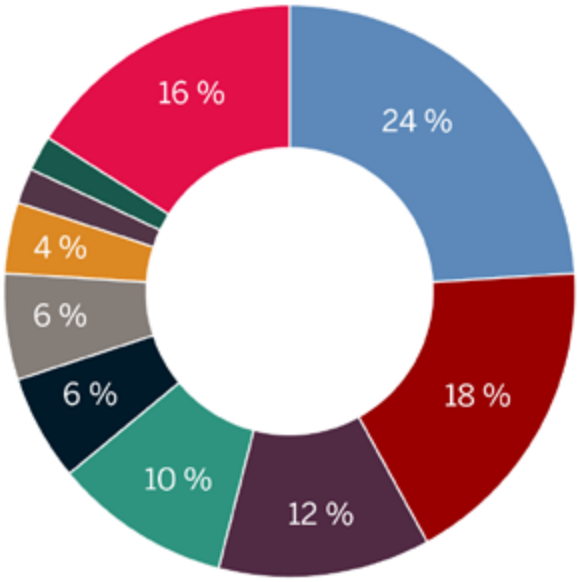
Simon C. Brassell



- Job
- Graduate School
- Still Seeking Employment
- Still Seeking Education
- Military Service
- Other Intentions

career outcomes:

87.5 % of our graduates are employed or in graduate school within 6 months of graduation.



- Environment/Natural Resources
- Education/Academia
- Technology/Science
- Government/Public Administration/ Public Policy
- Architecture/Engineering
- Hospitality/Tourism
- Arts/Entertainment/Media
- Construction/Manufacturing/Mining
- Consulting
- Other

IU Walker Center for Career Achievement

grad students + public outreach

The Earth and Atmospheric Graduate Student Association, or EAGSA, is an organization of graduate students founded in 2020 to boost graduate student coherence and involvement and to liaise with the department concerning graduate student matters.

It consists of five committees, each with a respective chair/president:

Activities,

Graduate Life,

Faculty Relations,

Finance, and

Communications,

each of which is intended to implement a specific component of EAGSA's broader mission.

EAGSA's primary aim is to "ensure an active graduate student role in departmental decision-making", while also promoting an environment of shared responsibility for departmental events. One such event that graduate students play a critical role in planning and staffing is the College of Arts and Sciences' annual community outreach event known as ScienceFest, pictured opposite.

EAGSA does not directly plan these events, but it aims to support graduate students who do and boost participation among all students, while also encouraging recognition for student contributions. As such, EAGSA functions primarily as a networking and advocacy organization for EAS graduate students.

EAS graduate students Jake Gearon (left) and Kwesi Quagraine (left center) guide local school-aged children through the streamflow table for ScienceFest 2021.

EAS graduate students CJ Salcido (left) and Anupama Chandroth (right) exhibit some fossils at the fossil table for ScienceFest 2021.

news + stories

news from the IU Geologic Field Station

Class of 2021 X429-X428

We had another successful summer of teaching at IUGFS. 47 students completed the face-to-face X429 and X428 courses at IUGFS and 10 students completed our virtual field course, E432. In addition, 29 students completed Montana State's 3-credit capstone field course which is taught at IUGFS just before X429. Over 80 % of students who took IU's face-to-face courses said their course was the most impactful course of their undergraduate education and 10 % said they learned more in their course at IUGFS than in all their other undergraduate courses combined. You can see some of our students in the picture above.

In addition to Erika Elswick, Page Quinton, Mike Rygel, and Jim Handschy, we had three new IU EAS faculty involved in X429 this year; Brian Yanites, Shelby Rader, and Andrea Stevens-Goddard each taught part of X429.

There have been several changes around the field station property. We've installed new firefighting capability with three 1,000 gallon water tanks and pumps placed strategically in higher-risk areas, fire sprinklers have been installed on the roofs of the Suttner Classroom Building, faculty housing, and the resident manager's house, and we've started removing trees that would pose immediate threats to buildings if there is a wildfire on the property.

Jim Handschy, Executive Director

Scan the QR code or click it to visit the IUGFS website.

Abhijit Basu, Professor Emeritus

Americanization at Indiana

Fifty years ago in 1971, I disembarked in New York. My first travel abroad. On July 30, I arrived at the commercial airport in the outskirts of Bloomington. A taxi brought me to the Men's Residence Center (now Collins Living Learning Center). I would be one in a group of 66 foreign students from 28 different countries to undergo orientation funded by the US Government. Several students were in the yard. A tall student who turned out to be a counselor, unfolded a sheet, asked for my name, and gave me my room number. Then they said something like, "We are going out for a beer. If you like to join us, hurry and we will wait for you." In about 20 minutes or so, I had a Stroh's at Nick's served by no less than the universally loved and respected legendary Ruth. My Americanization started in earnest.

By far the most cherished memory from my very first week as a graduate student at Indiana is the large-hearted welcome and friendship that was accorded to me by fellow students, faculty, and staff. That has stayed with me for fifty years and will last as long as my cognition lasts. Such friendliness is at the core of American identity.

During the pre-School orientation, we had to give a talk of general interest in our field. I decided on Gondwana glaciation. For evidence, I wandered over to Geology to get a sample of tillite. All faculty in sedimentary geology were in the field. A kind secretary suggested that Dr. Robert Ruhe might be of help. In answer to my request, he roared – "I do not collect that stuff. I do not collect butterflies either". I soon learned that his roaring was all a façade. He was a very kind person, albeit with a no-nonsense science-first attitude. He asked me to give a colloquium in the Department! Perhaps the first by an entering graduate student in the Department's history at the time.

English befuddled me. Fall picnics were abundant. Asked if she would be attending, a student answered – "I don't think so". I assumed that she was undecided. Later, I learned that she had said "no" in a polite way. Once I asked Dr. John Droste a question about x-rays and minerals. He explained but added – "You want to see Professor Pelletier". Because he had answered quite adequately I did not go to Professor Pelletier. Months later, Dr. Droste was dumbfounded upon finding that I had not seen Professor Pelletier. My fellow students explained that "you want to ..." was more of a command than an option. Oh well. In my own language Bengali, articles such as "a" or "the" or singular/plural verbs are unknown; and, gender difference does not exist in the pronouns such as "he/his" and "she/her". Those expressions do not come naturally to me. Or, learning to pronounce "...ough" as in tough, though, through, thorough. Enough? Of course, by now you get the picture of my predicament with English.

Regardless of the level of my Americanization, thanks to my education *sensu latu* and the spontaneous friendship of all at Indiana, I was ready for the research world upon graduation.

Max Scott, Graduating Senior

As someone who is graduating this December, I'm about to join the ranks of the proud alumni who learned, studied, and worked here over the years. I've applied to several graduate schools, including IU. Perhaps if I'm lucky I won't have to say goodbye to all of the wonderful people I've come to see as family in my years here.

In my time in the IU Department of Earth and Atmospheric Sciences I've learned more than I could have imagined, made some of the greatest friends I've ever had, become a leader to so many students with such fantastic futures ahead of them, felt all emotions from my greatest joys to my greatest frustrations, and even fallen in love here and there.

When I first showed up, and this is no secret, I was a cocky kid. I had too much confidence really, perhaps in an attempt to mask how absolutely starstruck I was with the many astounding scientists I got to meet while here. Partially I may have been insecure, nervous. But as I found my place in the department I came to call those scientists who I was startstruck by something else - friends. I had my fair share of distractions and missteps, but ultimately I think I got through alright. Maybe more than alright, but I'm not the one to say.

One thing I can say is that this department, their mission, these people - everything and everyone here that I have met have inspired me in so many ways to become the best version of myself, from a good researcher to even just a good person. I was given a lot of credit for the things that I achieved while here, but I could not have done those things without this family and department that I've come to consider a home. - Thank you.

In addition to his many outreach projects in the department, Max has been President of the EAS Geo Club for several years.

Scan the qr code or click it to watch Max's original videos (including his farewell work, *A Screwball To Die For*) on the GeoClub page!

Ruiliang Wang, 1996 Graduate

My career interest has changed quite a bit from geoscience to medical science, particularly in magnetic resonance imaging, searching for neural connectivity "biomarkers" of MDD (major depressive disorder) in adolescent subjects, for example. And I am a father of two medical workers (one in family medicine and one in anesthesiology) and grandfather of two toddlers. My wife works for an IT group in a financial services company. My whole family is living on Long Island.

Ruiliang Wang graduated from EAS with a Ph.D. in 1996.

retirements

BRUCE DOUGLAS

Dr. Bruce Douglas officially retired in 2021, with a long history of teaching both in the department and at the IU Geologic Field Station in Montana.

"My approach to teaching is intended to provide students with a broadly balanced treatment of basic geologic concepts and definitions with practical applications from both laboratory and field settings. Topics are presented in a manner that intertwines fundamental principles with applications and examples. One critical aspect is to encourage the development of the ability to conduct geometric descriptions and basic descriptions of the problem, or the strain, which provides the what and then couple this with the kinematic aspects of geology and the dynamics or stress conditions that correspond with the strain record (e.g. the how and why). There are two different sets of goals that I want to impart. The first set is a mastery of the basic concepts found in geology. The second set is to have a student to be able to take the basic knowledge and apply it to a new setting. This would involve evaluating the geologic setting, setting up testable hypotheses, laying out a series of data gathering steps, and then finally drawing conclusions regarding your initial questions. A major component of this teaching has been my involvement with the field teaching program in Montana. This has included Field Geology in the Northern Rocky Mountains (X429) and Field Geology in the Northern Rocky Mountains with Environmental Geoscience Applications (X498e). I have been at the center of the development of the environmental portions of the programs offered out of the IUGFS."

Bruce Douglas

September 13: Dr. Angie Pendergrass, Cornell University

Title: *Precipitation and its changes with climate: A CMIP6 perspective.*

September 20: iDEAS Seminar Series: Anne Kort, EAS Ph.D. Student | Dan Li, History and Philosphy of Science Grad Student

September 27: EAS Tudor Commemorative Lecture: Roger Bilham, University of Colorado, Boulder

Title: *Global earthquake fatalities: resilience vs. reality.*

October 4: iDEAS Seminar Series: Olivia Thurston, EAS Post-Doc and Thomas LaBarge, EAS Graduate Student

October 11: No colloquium. GSA Meeting.

October 18: iDEAS Seminar Series: Charles Salcido and Jake Gearon, EAS Ph.D. Students

October 25: Dr. Veronica Cedillos, GeoHazards International

Title: *Building disaster resilience in under-resourced communities: challenges, lessons learned, and what's needed.*

November 1: Dr. Melodie French, Rice University

Title: *Geology and deformation at the conditions of slow slip in subduction zones.*

November 8: Dr. Naomi Levin, University of Michigan

Title: *Rare and overlooked, but mighty: developing ^{17}O for the paleoclimate toolkit.*

fall 21 colloquia

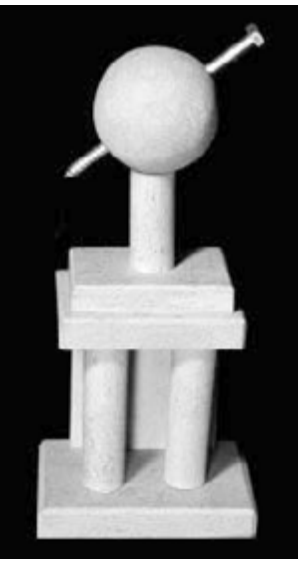
November 15: ReBecca Hunt-Foster, Dinosaur National Monument, Vernal, Utah

Title: *Vertebrate paleontology in the Age of Dinosaurs: science and public lands.*

November 29: iDEAS Seminar Series: Clarke DeLisle and Danielle Peltier, EAS Ph.D. Students.

December 6: iDEAS Seminar Series: Elizabeth Sherrill, EAS Ph.D. Student and Max Scott, EAS Undergraduate Student

and finally.....
the annual holiday banquet awards



the 2021-22 screwball award goes to:

DR. DAVID POLLY!!

(he hasn't won since 2011)

OTHER NOTABLE (and distinguished) AWARDS

Juergen Schieber won the Bigfoot Award

Kaj Johnson won the Comedian Award

Brian Roberts won the Ugly Sweater Award

Shelby Rader won the DJ Award

Max Scott won the Khaki Crusader Award

Michael Hamburger won the Fossil Fuel Fauci Award

Anne Kort won the Picasso Award

what the heck is a screwball award?

1. This award is given in recognition of the need to acknowledge the EAS faculty member who has especially distinguished him- or herself during the previous year through actions or deeds which are so clearly symbolized by the motif of this trophy.

2. All permanent teaching personnel in residence at the time of the award presentation are eligible to receive this award.

3. The recipient of this award shall be selected through secret ballot (one penny per vote; feel free to stuff the ballot boxes) by all EAS students and faculty.

4. Presentation of the Award shall be made at the annual Holiday Banquet. The announcement of the winner and actual presentation of the trophy shall be made by the previous year's winner.

5. No faculty member shall be eligible to receive this award twice in succession (sorry, Suttner.)

Special Points of Interest

- 2021-22 Screwball - David Polly (for the second time!)
- The Screwball Award originated in 1964, by Don Kissling (PhD '67) in recognition of the eccentric ways of his advisor, Don Hattin. As Hattin was not the only faculty member with eccentric ways, the presentation was made an annual event. Tom Perry won in 1965, and Judson Mead was the recipient in 1966.
- The Screwball Award was resurrected in 2006 after a three-year hiatus that sent this department into a state of confusion and despair.
- Bill Elliott designed and built the New and Improved Screwball Award in 2006.
- Whether or not Bill had too much time on his hands was a point of hot debate.

Campaign Guidelines

Anything goes.

However, please try to keep your campaign posters on THIS side of political correctness.

You will be in a losing battle with the custodial staff—expect many posters to have a wall life of less than 24 hours.

Good luck.

May the force be with you.

hello alumni!

(we'd love to hear from you)

Are you an alumnus or alumna of the Department of Earth and Atmospheric Sciences (formerly the Department of Geological Sciences)?

Would you like to update your contact information?

If so, please visit our online form and send us some stories, news about your employment or address or just chat.

https://earth.indiana.edu/forms/share-your-story.html

contact us

VISIT US ON SOCIAL MEDIA

Website: earth.indiana.edu

Twitter: @IU_EAS

Facebook: https://www.facebook.com/IUEarth

Indiana University College of Arts + Sciences
2021 Alumni Newsletter of the
Department of Earth and Atmospheric Sciences

This newsletter is published by the
Department of Earth and Atmospheric Sciences
in cooperation with the

College of **Arts + Sciences**

to encourage alumni interest in and support for
Indiana University.

INDIANA UNIVERSITY