PennState
College of Earth
and Mineral Sciences

Department of Geography

GEOGRAPH

Fall 2022

GEOGRAPH is a publication of the Department of Geography in the College of Earth and Mineral Sciences at Penn State.

Department Head: Brian King

Editor/Lead Writer: Francisco Tutella

Contributors: Emily Rosenman, Manzhu Yu, Jodi Vender

Contact:

Department of Geography

302 Walker Building

University Park, PA 16802-6813

Telephone: 814-865-3433

Email: geography@psu.edu

This publication is available in alternative media on request.

The University is committed to equal access to programs, facilities, admission and employment for all persons. It is the policy of the University to maintain an environment free of harassment and free of discrimination against any person because of age, race, color, ancestry, national origin, religion, creed, service in the uniformed services (as defined in state and federal law), veteran status, sex, sexual orientation, marital or family status, pregnancy, pregnancy-related conditions, physical or mental disability, gender, perceived gender, gender identity, genetic information or political ideas. Discriminatory conduct and harassment, as well as sexual misconduct and relationship violence, violates the dignity of individuals, impedes the realization of the University's educational mission, and will not be tolerated. Direct all inquiries regarding the nondiscrimination policy to the Affirmative Action Office, The Pennsylvania State University, 328 Boucke Building, University Park, PA 16802-5901, Email: aao@psu.edu, Tel (814) 863-0471. U.Ed. EMS EMS 23-26.

Cover Photo: "Nicolle Di Domenico in the laboratory." Nicolle Di Domenico.

Back Cover Photo: "Undergraduate students present their research at the Spring 2022 UROC Coffee Hour Talk."

www.geog.psu.edu

In This Issue:

Navigating a New Normal

Writing this column in my office in Walker Building, I am hopeful that we are approaching a new, post-COVID-19 normal. I anticipate that, like me, you are beginning the semester with a mixture of emotions, ranging from uncertainty to excitement and optimism.

Recent departmental events, such as welcoming the new cohort of graduate students, a reception hosted by Alan and Kristin Taylor, and the start of our Coffee Hour series are clear evidence that we have missed the interpersonal interactions that are integral to our positions. I have enjoyed being back in Walker Building and engaging with colleagues in-person rather than via Zoom or e-mail. I suspect there are some efficiencies with this as well. This will prove to be a consequential academic year for our department, and I look forward to the new opportunities we will experience.

This academic year comes with some changes. Two long-standing and terrific faculty colleagues, Dr. Roger Downs and Dr. Andrew Carleton, retired on June 30. We are so appreciative of all their hard work and support of the department over the years. They will be missed, though we know they will not be strangers!

We have had the opportunity to hire several new faculty. Dr. Amy Burnicki is joining us as an associate teaching professor after multiple years at the University of Connecticut. Prior to the University of Connecticut, she held positions at the University of Wisconsin and University of Michigan. Amy has extensive research and teaching expertise in land cover change assessment and geostatistics and will be an invaluable addition to our online and residential offerings.

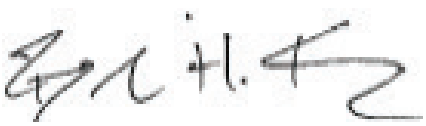
Dr. Ida Djenontin began as an assistant professor in the department with support from the Alliance for Education, Science, Engineering and Design with Africa. Ida's research and teaching focus on investigating interlinked global environmental disasters and their implications for biodiversity conservation, climate change mitigation, and sustainable natural resource-based livelihoods. Her work aligns well with some of our strategic initiatives while deepening our regional expertise in sub-Saharan Africa.

We also had great success with our search for a scholar with expertise in race and identity. In fact, we have hired two assistant professors, Dr. Dani Aiello and Dr. Belén Noroña, both of whom will begin on July 1, 2023, following the completion of their current academic sabbaticals. I look forward to introducing them once they officially arrive.

As we return to more in-person interactions, we are launching a new push to grow our majors. Our geography program is one of the best in the country. I want to see the program transition from a discovery to a destination major. This effort will require your support. From sending the department short videos for social media and the website showing what geographers do to visiting classrooms and meeting with interested undergraduates, I would like to see our community share the impactful research we are doing in new, exciting ways.

I look forward to interacting with you in-person throughout this year and wish you and yours a healthy and productive academic year.

Sincerely,



Brian H. King
Professor and Head
Department of Geography

What's up, DoG?

Miller Lecture

Stephanie Pincetl, professor and founding director of the California Center for Sustainable Communities at UCLA, joined the Department of Geography for a two-day visit in spring 2022. Pincetl delivered the annual E. Willard Miller Endowed Lecture, during which she discussed just transitions to renewable energy sources. Pictured after the lecture are Pincetl (right) and Louisa Holmes, assistant professor of geography.

Getting Social

Get ready to snap and share! The Department of Geography has taken its storytelling to Instagram, a social media platform for sharing photos and videos. Whether in the field or in the lab, geographers' work is inherently visual, and we want to share your work with as broad an audience as possible.

Current students, faculty, and staff can use an internal form to share visual media with the department's communications team. Alumni may send photos and videos to geography@psu.edu. We're especially interested in brief videos by alumni showing what they're doing with their geography degree.

Follow @pennstategeography on Instagram and @psugeography on Twitter for more community updates.

Department of Geography Committee Update: Cultivating belonging, dignity, and justice through action

The Department of Geography Belonging, Dignity, and Justice Committee (BDJ) had a busy second year. The committee changed its name from Diversity, Equity, and Inclusion to BDJ to reflect the members' interest in affecting structural change in our department and the wider discipline. The philosophy of belonging, dignity, and justice seeks to go beyond well-intentioned efforts to include historically marginalized people in the dominant white culture of many work and educational spaces. Instead, it questions the status quo and seeks to change these paradigms.

The committee's priorities for the 2021-22 academic year included working to institutionalize communications around BDJ in our department, preparing for a department climate survey in 2023, creating educational experiences, and applying for funding to create a mentorship program to support underrepresented students in applying to graduate programs in geography. For the first two priorities, the committee was supported by three wonderful undergraduate interns. Senior-year student Camila Pena worked with BDJ committee member Manzhu Yu to create a calendar of BDJ-related yearly events (e.g., Black History month) and content to increase awareness about BDJ within the geography community. Recent graduate James Niemiec and senior-year student Julia Cornell worked with BDJ committee member Louisa Holmes and graduate student Suraiya Parvin to create sample questions to incorporate into a department climate survey in the coming year. The climate survey will create benchmark data on how people in the department and Penn State feel, covering experiences of safety, marginalization, and/or support from the department and University.

BDJ committee member Bronwen Powell led an activity to celebrate Indigenous People's Day, which is held yearly in October. Powell created a list of places and items on the University Park campus that connect to the past Indigenous inhabitants of the land the University now

occupies. This educational activity also built community among department members as students and instructors explored campus from a new perspective.

Finally, committee member Emily Rosenman, working with Josh Inwood, successfully applied for a grant from the Penn State Equal Opportunity Planning Committee to create a mentorship program to support underrepresented undergraduate students from across the U.S. in applying to graduate school. The workshop, which will be held in May 2023, will fund students to come to Penn State for a four-day workshop, during which they will generate materials to apply to graduate programs in geography anywhere in the U.S. and Canada. The goal of the workshop is to diversify the discipline of geography in the long-term, and to provide support for these efforts through building diverse cohorts of students who can provide community to each other during graduate school. Three outside mentors from other geography programs will visit Penn State and work with department faculty and graduate students to mentor the visiting undergraduate students.

- Emily Rosenman and Manzhu Yu

Introducing Geography Guides

In spring 2022, Roger Downs, then-associate head for undergraduate programs and Jodi Vender, coordinator of undergraduate programs recruited a dynamic group of student leaders to become ambassadors for the department. These student ambassadors formed the first cohort of "Geography Guides." These ten students were tasked with spreading the word among their peers about opportunities available through the department's undergraduate majors, minors, and certificate programs. Their first official event was EMEX–the College's annual student-run open house for prospective students, held in March.

Among the guides' efforts this fall will be visiting introductory general education geography classes to recruit new students to the program.

The inaugural cohort of Geography Guides includes: Rylie Adams (B.S. '24), Nate Cherok (B.S. '24), Isabella Culver (B.A. '23), Allie Holland (B.A. '24), Allie Lister (B.S. '24), Ben Maus (B.S. '23), Camila Peña (B.S. '23), Evan Polyak (B.S. '23), Greg Roszyk (B.S. '23), and Emily Shiels (B.S. '24).

- Jodi Vender

Below: Emily Shiels, Allie Holland, Allie Lister, and Evan Polyak share their experiences with prospective students.

New first-year seminar course examines geography of redistricting

American elections are rooted in location, but politicians and political scientists largely determine the shape of legislative districts. A new course offered by the department brings the focus of the redistricting process back to the geographic basics.

"I think political scientists mostly think about redistricting at the point where boundaries matter for a particular election," said Chris Fowler, associate professor of geography and instructor of GEOG 298 The Geography of Redistricting. "As a geographer, I want to start much earlier than that. The questions I want to start with are: What is this institution we have that draws boundaries around a region then says this is going to be associated with representation? What does it fundamentally mean to have elections and to have those elections based on location? That's an important question when we think about representative democracy in the United States where we have a winner-take-all system based on geographic location."

Fowler, who served on Pennsylvania Governor Tom Wolf's redistricting commission last fall, has lined up several speakers from diverse fields to share their perspectives on the process. An expert on The Federalist Papers spoke to students about what Alexander Hamilton and James Madison were thinking when they proposed organizing elections around geographic interests such as slaveholding versus non-slaveholding areas and urban versus rural geographies. Gov. Wolf visited the class remotely on September 8 to discuss the most recent redistricting process and took questions about what it means to represent constituents from diverse areas of the state. Future guest lectures and question-and-answer sessions will feature journalists and grassroots organizers.

The course will also delve into questions of identity and offer students opportunities to work with publicly available data from the 2020 census. Hands-on activities involving mapping software will complement discussions on gerrymandering and why decision-makers may choose to divide a city like Pittsburgh or State College, Pennsylvania, into several legislative districts.

"Historically, there have been multiple congressional districts in the Borough of State College," said Fowler. "Currently, the relatively good state legislative proposal has State College in two different districts. A lot of times people see this and think you can't split the borough, but it turns out that if you're doing good mapping at the congressional level, it's difficult to keep Centre County together."

State College often appears as a Democratic blip on the edge of a huge Republican expanse, according to Fowler. The borough often ends up grouped with Erie or the northern tier counties, which are largely rural and Republican. However, connecting State College to other parts of the state that share similar political leanings can create issues counter to good representation in other parts of Pennsylvania. State College serves as a great case study for many of the questions that the class will attempt to address.

The course's main goal, according to Fowler, is to show students the benefits of examining an issue from a geographic standpoint.

"The first thing I want to do is teach the students: this is a problem you thought was interesting before, now look at it as a geographic problem and look at all the doors that thinking opens up for critical analysis," he said. "Geography has a tremendous amount to offer any kind of social, environmental, political, or economic problem. What I want to teach is fundamentally a way of understanding the world as a series of geographic problems."

Geography graduate receives National Science Foundation fellowship to study trust in thematic maps

Tim Prestby, a doctoral student in the Department of Geography, received a National Science Foundation Graduate Research Fellowship to study trust in thematic maps.

Thematic maps are visual tools that show the characteristics of one or more features depicted on a map, such as flood risk or mortality rates. They appear everywhere, from national news broadcasts to social media, and visual mediums such as maps can have a large impact on a broad audience. Reader trust, however, varies, and Prestby intends to identify just what factors influence a map's trustworthiness.

"Maps are ubiquitous in society, now even more so than usual," said Prestby, who recently graduated with a master's degree in geography from Penn State. "There's a ton of anecdotal evidence that people generally trust maps more than other types of information because they see them as pieces of objective truth. They're also becoming an increasingly common way to communicate science because a lot of science is inherently spatial, and maps are an intuitive communication medium."

Prestby's dissertation, which he will pursue with Anthony Robinson, associate professor of geography, will include three separate components. The first will be a thorough review of available literature on how trust has been conceptualized and studied within cartography, geography, and related fields like information visualization. He will use the findings to direct the other components of his research.

The second part of his project will examine the psychological factors underlying trust. Specifically, Prestby will look at the potential impact of a map on a reader and how it affects trust. For instance, he will study if showing a flood risk map to an individual who lives in the impacted area would increase or decrease the reader's trust versus if someone who lived far from the impacted area viewing the same map.

"One of my hypotheses is that if a map shows something that might negatively impact the reader, that person would be less likely to trust the map," Prestby said. "They will be more likely to critically analyze the map because it is of greater impact to them. Whereas if something isn't going to affect the reader, the individual is more likely to accept the information at face value."

He will also study how a map reader's prior beliefs affect trust. For example, someone who lives on the coast and believes in climate change will be more likely to trust a map showing sea level rise than another person who lives in the same area but holds different views, said Prestby.

The final component of his dissertation will examine how map design characteristics such as color and context, or how a map is framed, affect trust. When it comes to color, cartographers look at congruent and incongruent color schemes and the different ways colors can be interpreted.

"One major way to examine color congruence is through a cultural lens," said Prestby. "In the United States, map readers generally perceive blue as being cold or potentially sad, whereas red generally communicates heat or feelings like anger. My hypothesis is that if the color scheme is incongruent, then people will trust a map less versus if a color is congruent."

Context includes where a map appears, whether it be in a scientific journal, magazine, or on a social media site, and the details it contains like titles and annotations, explained Prestby. Maps can be highly authored and contain much more writing, or largely open-ended and left to the reader to interpret. All these aspects may affect reader trust, Prestby said.

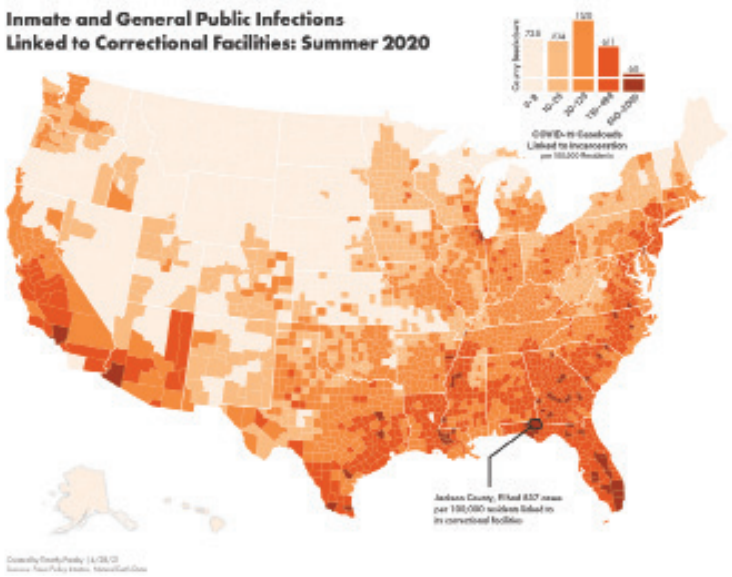
Prestby's fellowship will also include an outreach component. The Department of Geography is currently installing a cartographic makerspace, the GeoGraphics Lab, on the University Park campus.

Prestby would like to use the lab to hold a new workshop series focused on best practices that result from his research to improve spatial scientific communication.

"In order to foster broader trust in science as a whole, we need to make sure that we're communicating spatial information in really effective ways and also fighting misinformation with spatial data," he said.

He would like to see the GeoGraphics Lab get involved in some of the mapping classes taught by department faculty to educate and inspire undergraduate students and provide mentorship opportunities with skilled cartographers.

Prestby said he invested a lot of time and effort into the fellowship application and acquired new skills in the process. He credited Robinson, William Head at the University of California Santa Cruz, and the rest of Penn State's Department of Geography faculty for their continuous mentorship and support.



A map showing COVID-19 infections linked to correctional facilities in summer 2020. As part of his fellowship, Prestby will study how color affects reader trust. The colors in the pictured map are culturally congruent-orange evokes thoughts of correctional facilities in the United States. They are also analytically congruent in that the data is continuous, without a meaningful midpoint, so a sequential color scheme is used with multiple shades of orange.

"It's difficult to describe how good it felt and still feels to receive this fellowship," he said. "Besides my master's paper, I haven't put as much time and effort into a project as I have this application. I'm extremely thankful because the fellowship will completely enrich my experience here at Penn State and allow me to dive into the research that I really want to do."

Geography student Shuyu Chang awarded NASA funding to study harmful algal blooms

Shuyu Chang, a doctoral candidate in Penn State's Department of Geography, received a Future Investigators in NASA Earth and Space Science and Technology (FINESST) award to study harmful algal blooms in the Chesapeake Bay watershed.

The watershed extends across six states–New York, Pennsylvania, West Virginia, Delaware, Maryland, and Virginia–and the District of Columbia. The rivers and streams that feed into the bay flow across farmland, and nutrient-rich agricultural runoff remains a concern. The nitrogen and phosphorous found in fertilizers and manures can enter waterways and cause algal blooms, some of which may contain bacteria that are harmful to animals, pets, and people. Understanding what happens in these upstream systems is important for addressing the water quality of the bay itself.

"The Chesapeake Bay watershed is home to more than 1,400 reservoirs," said Chang. "Scientists have done a lot of work to study harmful algal blooms and nutrient loading, but mainly in the Chesapeake Bay itself. We have less understanding of the freshwater ecosystems, especially when it comes to the biogeochemical processes occurring in these reservoirs."

The three-year, nearly $150,000 award will enable Chang and her collaborators to use satellite imagery and sediment core data to study 1,475 reservoirs in the watershed. They aim to develop novel machine-learning models to identify historical harmful algal bloom events and understand nutrient loading in the watershed and predict future events under a changing climate and water management policies.

Chang's project is the first to examine all 1,475 reservoirs at once, a large task made even more complicated by reservoir size and location. The reservoirs range in size from approximately 2.5 to 13,000 acres. The size and location of each reservoir affect residence time, or how long nutrients like phosphorous and nitrogen remain in the reservoir, and make harmful algal blooms more likely to occur. Residence time varies in the reservoirs from one day to more than one year, according to Chang, and water management policies vary by state.

To identify potential historical algal hotspots, Chang will use the novel Mixed Density Networks (MDN) machine-learning model. The model currently uses data from the Landsat-8 and Sentinel 2 satellites. The satellites provide information about concentrations of chlorophyll-a, a pigment found in algae, in the reservoirs from 2015 to the present. Chang will further develop the MDN model to incorporate Landsat-7 satellite data, which can provide information back to the year 2000.

Chang and her collaborators will then link the satellite data with sediment core data to identify the past presence of harmful algae like cyanobacteria. Linking the data will help the research team to estimate harmful algal bloom events. The scientists plan to train the model at a global scale so researchers and water quality agencies around the world can use it to identify potential high-risk areas that may require future close monitoring.

Chang will use another machine learning approach to estimate historical nitrogen and phosphorous loading in each reservoir. The method, called long short-term memory, is often used in hydrology to predict time-series discharge measurements and soil moisture. Chang will apply the method to nutrient loading to better understand how nitrogen and phosphorous have impacted water quality.

"One of the main contributors to harmful algal blooms is excess nutrients in the water," she said. "Nitrogen and phosphorous help algae outcompete other water organisms to form harmful algal blooms. This is why we want to know how these nutrients enter and remain in these reservoirs."

Chang will combine the historical estimates with future nitrogen and phosphorous projections based on current water management policies, watershed attributes, and climate projections to model future harmful algal bloom events.

"We have an incomplete understanding of how warmer temperatures and more precipitation events under climate change, combined with current water policies, will affect reservoir nutrient cycling and the timing and frequency of harmful algal blooms in these water bodies," Chang said. "The water resources in these reservoirs serve as recreational areas and provide drinking water to the general public. The results of my project, especially the future projections, can help local water authorities to think about mitigation policies, specifically in reservoirs that may be at a higher risk for harmful algal blooms in the future."

Chang said that she gained valuable experience just going through the application process and credited a class at Penn State, GEOG 502 Research Scholarship in Geography, for making the process easier. She also credited her successful proposal to constant discussions with her adviser, Kim Van Meter, assistant professor of geography.

"Kim and the department were very supportive, as always," said Chang. "It's such an honor to receive this award. The whole experience has helped me build connections at NASA and prepare me for my future career in research."

Ask a Geographer - Q&A with Master's Student Nicolle Di Domenico

When it comes to tackling the big questions surrounding climate change, Nicolle Di Domenico knows that every bit of information counts. The second-year master's student earned her bachelor's degree in geology and a minor in GIS from Kent State, where she studied nutrient cycling biogeochemistry in vernal ponds in Ohio under a changing climate. She also spent a year interning at Oak Ridge National Laboratory, where she used panchromatic remote sensing, or black and white imaging, and machine learning methods to identify polygonal ground in the Arctic and how these environments may react to a warmer climate.

Here Di Domenico discusses her master's research, living in State College, and the impact of female role models in STEM.

What is the focus of your research?

My master's research is founded on what I learned at Oak Ridge. Polygonal ground describes these small Arctic landscapes. Some polygonal ground fill with water during wet seasons then dry out seasonally, while others remain dry year-round. These different processes impact the type of carbon released from the soil. If we can understand polygonal ground dynamics, we can better understand how the atmosphere might change over time.

Even though we have begun to understand how important these landscapes are to the environment, nutrient cycling, and the global carbon cycle, we don't know where they are in the Arctic tundra. The features within polygonal ground landscapes, ice-wedge polygons, are very small. A single ice-wedge polygon can measure five to thirty meters in diameter, and on small scales, it is complex and heterogenous. If satellite imagery isn't fine-scaled enough, everything becomes jumbled. I wasn't as familiar with machine learning as I am now, so at Oak Ridge I used image filters. The filters helped me see shapes and patterns, and polygonal ground has a distinct shape and pattern.

Here at Penn State, I am getting a more formal education in machine learning. I'm using better methods, models, and larger areas of imagery to locate polygonal ground at a scale most beneficial to other people's research. Ideally, my outputs can be used for input into other scientists' models to further our understanding of climate change and carbon cycling.

I am also looking at how polygonal ground occurs with seasonal inundation of water, because water over polygonal ground changes the type of carbon released into the atmosphere. If polygonal ground, and each ice-wedge polygon within polygonal ground, doesn't have water over it, those soils most likely contain a lot of oxygen. Oxygen-rich soils tend to release carbon dioxide. If soils are waterlogged, they tend to release more methane and carbon dioxide. Methane is better at warming our planet than carbon dioxide, so that's critical knowledge.

Your master's research is part of a National Science Foundation Graduate Research Fellowship. Would you describe your initial reaction when you learned that you had received this highly competitive award?

I didn't know when they were notifying recipients. When my undergraduate adviser and mentor at Oak Ridge, Elizabeth Herndon (who received her Ph.D. in geosciences from Penn State in 2012), texted me to say congratulations, I said, "Thank you. What did I do?"

She sent me the link to the awardees page, and I was surprised. I was very happy and thankful. One of my first

reactions was to email the people who had helped me, the people who wrote my letters of recommendation, and let them know.

Why did you choose Penn State?

I really appreciated the connection that I had with my adviser, Shujie Wang. She seemed just as excited about working with me as I felt about working with her. Shujie is the perfect blend of environmental sciences, remote sensing, and information and technology. She uses all her skills to answer questions that really interest me.

I was also excited about the Earth and Environmental Systems Institute (EESI) Environmental Scholars program because my goal right now is to develop my technical skills. I come from a traditional geology background and it's a jump from going outside and doing water sampling and eating three peanut butter and jelly sandwiches for lunch in one-hundred degree heat to being inside working at a computer writing code. So, I was really interested in the community of scientists who have successfully made a career having made that jump between the two fields. It seems like Penn State has that at EESI and within the Department of Geography.

What do you like most about your Penn State experience so far?

I've made good friends in the geography and geosciences departments and with some professors. After being in a COVID-19 world for so long, you appreciate human interactions more. It was nice finally to be around people and to see faces instead of emails all day.

I joined a mixed martial arts studio and am training in boxing, Muay Thai, and Brazilian Jiu Jitsu. Outside of my research those are the activities that I most look forward to. I also like getting outside and find the State College area very beautiful. A large portion of my home state of Ohio was glaciated, so it's relatively flat. I love the lush rolling hills of Pennsylvania and the trail outside my apartment that I run on, which leads right to the Arboretum at Penn State. The Arboretum is gorgeous.

What's your favorite Creamery flavor?

I've tried several of their coffee flavors. My favorite is coffee mocha fudge. It's all the best things this world has to offer. I feel like with chocolate and coffee, you just can't go wrong.

Could you talk about your passion for encouraging women to pursue careers in the STEM fields and your work co-organizing the Empower 2022 scientific conference?

I've been fortunate to be around women who have been great role models. I don't think I would have gotten to where I am today if I didn't have female role models around me.

Top left: Di Domenico at the Arboretum at Penn State. Above: Di Domenico practicing mixed martial arts at a gym in State College, Pennsylvania.

Photos courtesy of Nicolle Di Domenico.

The Empower 2022 conference was one way to give back and encourage young women to pursue STEM education. The event was open to the public, and we had high attendance from a local high school and Penn State. It featured scientists from different backgrounds and abilities, and diverse ethnicities and identities. The conference was one way of trying to let women see that there are people like them doing science.

For the upcoming year I was elected to the Young Women in STEM Workshop co-chair position where, once a semester, I and my co-chair will create an event to help engage young women from fifth grade through high school in STEM. It's an effort to show them that there are other women in college who are scientists. That when they think of a scientist, they can picture these women.

Last question. Because we're in the geography department, if you could travel anywhere in the world, where would you go and what would you do there?

I studied Chinese in high school and college, and I learned about this place called Zhangjiajie. If you've ever watched a pivotal fight scene in a movie set in China, or maybe *Avatar: The Last Airbender* has something similar to it where the character Aang is fighting the Fire Lord, Zhangjiajie has these pillars of rock that jut up from the ground. It's like a forest of them basically. They're really pretty and topped with grass and moss. I don't know what I would do there other than walk around and appreciate everything, and maybe speak some Chinese. But I would love to go there.

Top right: Di Domenico prepares samples in a laboratory. Left: Di Domenico visits the Lion Shrine at the University Park campus.

Photos courtesy of Nicolle Di Domenico.

Community Updates

Hires

Ida Djenontin joined the department as an assistant professsor. Her research lies at the intersection of environmental governance and sustainable development, specifically in sub-Saharan Africa. Djenontin's research addresses the implications, including slow-acting disasters, of interlinked environmental and climate changes on forested landscape ecosystems as resource commons.

Amy Burnicki joined the department as an associate teaching professor after multiple years at the University of Connecticut. She has held positions at the University of Wisconsin and University of Michigan. Her extensive research and teaching expertise in land cover change assessment and geostatistics will contribute to the department's online and residential offerings.

Retirements

Roger Downs, professor of geography and former department head and associate head of undergraduate programs, retired on June 30. He taught undergraduate courses in human geography, human spatial behavior, and urban geography, and graduate courses in research design and geography education. His research focused on the development of spatial thinking and spatial literacy, the history of geography education, and the design of curricula for geography and spatial thinking.

Andrew Carleton, professor of physical geography, retired on June 30. His research and teaching activities focused on the fields of synoptic climatology, satellite climatology, polar climates, climate variations, environmental climatology, and paleoclimatology. He has authored numerous peer-reviewed articles that have appeared in leading journals, including *Nature*, *Journal of Climate*, and *Journal of Geophysical Research*.

Awards and Achievements

Jennifer Baka was promoted to associate professor with tenure. She also received a National Science Foundation CAREER award to study the development and potential impacts of a petrochemical cracker plant in western Pennsylvania.

Bronwen Powell was promoted to associate professor with tenure.

Andrew Carleton was awarded an E. Willard and Ruby S. Miller Professorship in Geography.

Manzhu Yu was named the E. Willard and Ruby S. Miller Faculty Fellow by the College of Earth and Mineral Sciences at Penn State.

Guido Cervone was appointed an American Geophysical Union Local Science Partner. He was also named a faculty affiliate at the Scuola Superiore Sant'Anna in Pisa, Italy.

Joshua Inwood received the American Association of Geographers Media Achievement Award.

Karl Zimmerer received a Montpellier Advanced Knowledge Institute on Transitions 2022-23 Research Fellowship, France.

Graduate students Nicolle Di Domenico, Emma Robertson, and Tim Prestby received National Science Foundation Graduate Research Fellowships.

Graduate student Ruth Buck received a National Science Foundation Graduate Research Fellowship Honorable Mention.

Graduate students Vivian Rodriguez Rocha and Saumya Vaishnava received Society of Women Geographers Evelyn L. Pruitt National Fellowships for Dissertation Research.

Support Geography

The Department of Geography at Penn State aims to inspire the highest levels of geographic teaching, learning, and mentoring while engaging in the scholarly pursuit of geographic knowledge, and to apply this knowledge toward understanding the ever-changing interplay of human societies and physical environments. To help support our mission, please consider donating to the department.

PennState
College of Earth
and Mineral Sciences

Department of Geography

Department of Geography
302 Walker Building
University Park, PA 16802-6813