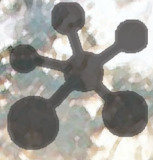




# GEO GRAPH

Volume 17, Issue 1 • Summer 2018





# PennState

## College of Earth and Mineral Sciences

### **GEOGRAPH**

Volume 17, Issue 1, Summer 2018

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

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**2 Department of Geography Summer 2018**



## From the Department Head

# Chalking Up Clusters

One of the many pleasures of leading a department of geographers is the wide range of topics we study and are passionate about. This year we all got into a room together and brainstormed about the research themes that draw us together and make us distinctive (a.k.a. faculty meeting—not your usual source of fun). It got loud. We laughed. We complemented and contradicted one another and threw a mix of brilliant and silly ideas onto the wall, literally. There was an old-fashioned aspect to it, with me wildly scribbling in chalk on our wall-size blackboard to keep up with the storm of interrelated ideas.

We arrived at a set of research clusters that are inviting to students and to collaborators looking for the emphases that resonate with their interests. In conversations with visitors and administrators, the clusters elicit surprised interest: “Oh, I didn’t know that is geography.” The department continues to use the traditional four subfields of geography to structure our hiring, teaching, and curriculum planning—Human, Physical, Environment and Society, and GIScience. The six new clusters show how we are connected across the four-field breadth.

What are these research and specialization clusters for Penn State Geography?

**Environmental Change and Prediction** emphasizes understanding the biophysical linkages and feedbacks in environmental systems that sustain biodiversity, livelihoods, and ecosystems services.

**Food Security and Human Health** focuses on spatial disparities in

access to employment, education, health care, and food that are accentuated as urban areas grow and lower income regions become integrated into global economic systems.

**Geospatial Big Data Analytics** uses a rapidly expanding array of sources that include sensors, GPS-enabled devices, volunteered geospatial data, public health records, and geoparsed place references in text and speech.

**Justice, Ethics, and Diversity** explores how power and difference operate from the local to the global, asking how different groups envision alternative futures and transform the world around them in more just and sustainable ways.

**Population, Environment, and Governance** examines the spatial organization of cultural, political, and economic relationships, as well as how these social systems interact with the natural environment.

**Spatial Modeling and Remote Sensing** includes developing tools and models to understand, detect, and predict interactions within and between ecosystems, the atmosphere, and the critical zone across scales that range from local to global.

As we’ve built these research clusters into our public presence and recruiting, an added bit of fun has been choosing scalable glyphicons that are graphic identifiers for each cluster—kind of like nerdy emojis. Check out how we have used them on the department home page and threading through the images in the research clusters section of our new website at [www.geog.psu.edu](http://www.geog.psu.edu).







# Students and colleagues

**Geography professor emeritus Peirce F. Lewis (pictured above) died at Mount Nittany Medical Center, State College, on February 18, 2018.**

The following article is an excerpt from, "Classroom Masters," originally published in the May/June 1992 issue of *The Penn Stater*.

**By Jodi Vender**

**A**n energetic man in his late fifties greeted us by switching off the lights and switching on a slide projector.

"As we plunge into intellectual darkness, let me assure you that after this class, you will never be able to look at the world in the same way again. At least, I hope not." In spectacles and a khaki field jacket, Peirce

Lewis fit everybody's idea of a geography professor.

"I'm going to show you the cultural landscape of the United States and give you the tools to understand why things are where they are, and how they got to be that way," Lewis continued. "Then you will show yourselves and me what you have learned by going out there and reading the local landscape yourselves. This first slide ..."

The lights snapped on again. I blinked, not just because my eyes rebelled against the sudden brightness, but also because my mind reeled at the revelations I had just encountered.

I had always thought of geography as nothing more than maps of places; I had never considered the impact of people on those places or of the places on people.

Lewis handed us a five-page list of important dates in the history of North America, along with the basic geographical features of the United States and Canada. "Your first assignment is to identify all of these places and features on a blank map and to commit all of these dates to memory."

We all looked at each other and groaned.

"Before you can begin to understand





**Peirce was an inspiration**, a mentor, a friend, a window on the world and a giant presence in so many ways. I'm grateful for having had the opportunity to spend as much time with him as I did at Penn State and through our correspondence and occasional visits in the years after. I last saw Peirce when I visited in 2008 for the fortieth anniversary of Coffee Hour. A bunch of us went out for dinner that evening, a group that included Wilbur Zelinsky and Greg Knight, who are now also missed. I also stopped by Peirce and Felicia's house the next day before leaving town to return to Toronto and spent a couple of hours visiting there, too. It was right before the first Obama election and I know we talked politics. As was his wont, Peirce sent me home with a couple final mementos which I now hold dear along with all the other memories.

—Brian Banks '84g

# remember Peirce Lewis

why things are," he explained, "You must know what, when, and where they are."

Chris Gazze '91 was a fellow student in that geography course. "I was surprised when he started the first class by showing a picture of a barn and insisting that it was an interesting cultural artifact," Gazze commented. "Come on, what could be remotely interesting about a barn? But Lewis's enthusiasm really rubs off on everyone, so I was willing to suspend my disbelief for a while. And pretty soon I saw his point."

Lewis himself sees three prerequisites for good teaching: "One: you have to love your subject. Two: you have to know what you're

talking about. Three: you have to like the students. The question is whether you can make an impact on somebody's mind and soul."

He believes that teaching is a two-way street, that both students and teacher must provide positive reinforcement. "In some classes," he noted, "students behave as if they're brain-dead, but even these can sometimes be stimulated."

Lewis claims to be "somewhat resentful" of students who don't want to be there, those who cross their arms and say, "I gotta be here. Learn me."

"Learn me' ain't a transitive verb!" Lewis insists. "Students and

teacher must come to a common ground."

He says the most successful experiences occur when students teach themselves.

A great example is the State College walk we had to take for GEOG 102: The American Scene. It consisted of a nine-mile trek through the streets and alleys of the town, after which we had to write a twenty- to thirty-page paper about what we saw. The amount of effort I put into that project was almost as tremendous as the blisters on my feet, but I learned to see things about my environment I had never noticed before.

*See LEWIS, p. 22*

# Making good geographical sense

By Ron Abler

I have just spent a poignant afternoon browsing my correspondence with Peirce; hours sweet with nostalgia for an acquaintanceship that began when I joined the Penn State geography faculty in 1967 and grew into comradeship, hours of sadness that his death brought that relationship to the definitive end.

As this collection of recollections attests, Peirce was many things to many individuals, all of them wonderful—except for his driving when conducting field trips. Such was his exuberance for what he was seeing and explaining that he generally neglected to watch the road or other traffic. We soon developed elaborate conspiracies to keep the car keys out of his hands.

In retrospect, among our many interactions as colleagues, neighbors, and friends, I am especially happy to have aroused a passion that

dominated the last decades of his professional life—his love affair with New Orleans. In 1971 the AAG's Comparative Metropolitan Analysis Project needed someone to write the vignette on New Orleans, one of the twenty metropolitan regions the project embraced. Nobody local could or would write it, a problem I mentioned to Peirce one day. He tentatively volunteered, saying that he had long wondered whether he could go to a new place cold and make good geographical sense of it. Project Director John S. Adams and I put the suggestion to the project's Steering Committee (Brian J. L. Berry, John R. Borchert, Frank E. Horton, J. Warren Nystrom, James E. Vance, and David Ward) who, familiar with Peirce's capabilities, approved. The resulting 1976 vignette *New Orleans—The Making of an Urban Landscape* (Ballinger Press), became an instant classic, to be followed (after repeated requests) in 2003 by an updated and expanded version with the same title

**I attended college and graduate school** during a national division driven by racial tensions, gender roles, and an unpopular war. Within the Penn State Department of Geography, there was a civil war over qualitative versus quantitative methods students had to navigate. Interesting times, indeed.

My love of place (going out in the field with open eyes) led me to Penn State. Peirce Lewis spoke his mind, even when it was painful. I needed to rewrite my master's thesis as it wasn't up to his standards. This prepared me for a career doing research motivating people to do the work to change. Dealing with the world as it is gives a great life lesson. I learned from him that anywhere you go, you really need to see what is there. The best class I have ever had was field methods with a sixteen-day trip throughout the eastern United States.

Everyone used a topographic map to plan a local field trip. Mine was in Virginia tobacco country, another Harlem. Traveling in a large van, we covered a lot of country, most where tourists seldom go. In a van with your professor for that long—an awesome and rare experience. For a geographer or anyone loves travel, I cannot think of a better experience.

I did not use my geography for my career, but his love of the field made me someone eager to see what is over the next hill.

—Joel Stegner '74g



(Center for American Places), that was subsequently reissued in 2010 and 2018 by the University of Virginia Press. Good geographical sense indeed!

Among the many things I cherish about Peirce, foremost is the delightful yet erudite banter of most of his letters and emails over the years, as in this from 1999:

*Sorry to have missed you and Barbara at the Dean's bash, but the sweet Felicia and I were off tarryhooting around the West Country and Wales. I wish to discover where the poet Browning is buried so that I can go dance on his grave. We took his advice on being in England now that April's here, and the advice is bad—constant rain, and even some snow: we crossed Exmoor in a howling blizzard, although it may have been the hound that was howling. I later learned that Chaucer had some nice things to say about English Mays. So much for the romantics.*

*But egad, sir, rural England remains SUCH a civilized place with SUCH nice people! And I may have discovered the best beverage in the United Kingdom: Ruddles Strong Ale. Comes in half-liter cans—sorry, tins, and my goodness . . . English food, alas, still suffers from the falling damps, despite propaganda to the contrary. I can't begin to imagine how the British population manages to ingest that volume of boiled potatoes. I supposed they produced the carbohydrate that fueled the Building of Empire.*

*Btw, if you and Barbara haven't visited the north Welsh city of Conwy, with its Edward I castle and crenellated walls and a Telford cast-iron suspension bridge, run, do not walk . . . And just to the south is Bodnant Garden, which is worth a trans-Atlantic trip just on its own.*

*When are you coming next to the Happy Valley? F & I would like to slay a fatted calf for you and shew you our new Park Avenue digs. The azaleas are in bloom as I speak . . .*

**What do I recall about Peirce Lewis?** For one, he was a strong disciple of William Morris Davis, whose theory of erosion cycles predicted ancient erosion surfaces dubbed peneplains. Peirce saw several of them in the Ridge and Valley area around State College. By contrast, Larry Lattman, the geologist who was my other M.S. thesis adviser, saw only local broad uplands responding naturally to geologic structure and denudational processes, as predicted by John Hack's theory of dynamic equilibrium, with which I agreed, much to Peirce's dismay/disgust. My thesis was approved for defense after much back and forth, until

Peirce and Larry agreed to disagree—provided I carefully qualified what I wrote. A useful experience, to be sure.

I also recall Peirce's fondness for Erwin Raisz's "Physiographic Diagram of the United States," which I used as the primary text when I taught his landforms course when he was on leave during my final year at Penn State. Aside from an appreciation of careful discourse, the most valuable thing I learned from Peirce is that one can shift gears among research foci: I caught him well after he had shifted from political geography (which he still taught) to physical geography, which he was jettisoning to focus on cultural/historical/landscape geography, for which he is best known. That one need not feel locked into a subfield in which you've made a heavy investment was a useful lesson.

—Mark Monmonier '69g

## FACULTY PROFILE

# Cracking the code for sustainable energy

Jennifer Baka joined the Department of Geography in the summer of 2016. She is an assistant professor of geography who studies energy using the emerging subfield of political-industrial ecology.

“Political-industrial ecology is the integration of two kinds of systems thinking,” Baka said. “From an industrial ecology perspective, we think through the whole supply chain for a particular resource. For example, from the extraction of crude oil, to transportation, to refining it into gasoline (and other products), to distribution, to the exhaust coming out of your car.”

“From a political ecology perspective, we think about the political and economic processes shaping that supply chain,” she added. “How are regulations created? Who decides? What are the implications?”

Bringing the two areas of thinking together, Baka considers the metabolism along the whole supply chain and how those systems are governed in a systematic way. “We can identify where power exists. We

*“... people need to know where their energy comes from, to use just what they need for their daily activities, and to be aware of the environmental impacts of energy consumption.”*

can think about the way an energy system is regulated. We can ask: Is it fit for purpose? For example, does it provide adequate environmental protections?”

Baka’s interest in studying energy and asking those kinds of questions was kindled by her experiences growing up.

“I’m a former northeastern Pennsylvania coal mining town resident. I grew up in a town that still has a mine fire—Mayfield, Pennsylvania, outside of Scranton. I had several respiratory issues growing up due to the mine fire, including asthma, which regularly kept me out of school for thirty days a year, so I was always interested in how government decides what to remediate and what to leave and let burn. I graduated from college in 2000 when energy deregulation was happening in the United States and energy privatization was an interesting problem to study.”

In her teaching, research, and service, Baka tries to debunk myths about energy. One of the most common, she said, is that renewable or green energies are unquestionably better for the environment.

“If you take a political-industrial ecology perspective, looking at solar panels for example, you’ll discover that manufacturing solar panels requires a lot of energy and uses numerous chemicals and rare earth elements. It’s also difficult to recycle solar panels. You can see that we

might just be trading one type of environmental impact for another, shifting the costs without a net gain. Another example is the biofuels program in India, which I studied extensively for over a decade. In that case, public lands were taken away from poor rural communities that had been using them for grazing. In Pennsylvania, hydraulic fracturing, commonly referred to as fracking, brings up another interesting case, to see firsthand the potential impacts to ground water and risks to worker health and safety.”

Fracking is a topic Baka studies extensively. “I am really struck by the parallels between the biofuels





*Jennifer Baka, seated at the left end of the table, participates in a League of Women Voters' panel on the methane cracker plant.*

program in India and fracking in Pennsylvania. Biofuels development in India was framed as an effort to improve the country's energy security and also create new jobs for rural communities, but we found that was not the case. The new biofuels program provided jobs only seasonally compared to previously existing agricultural jobs that provided work year-round. That same rationale in Pennsylvania has positioned fracking as a way to revitalize rural communities. (As an interesting aside, it is unique to the United States, that landowners hold the mineral rights to their property; in most other countries, the government holds the mineral rights.) Biofuels in India was a bust. We are going back to see how it's going now and interview those involved."

"Countries like China, South Africa, and Germany commissioned scientific councils to investigate the environmental impacts compared to the economic benefits before going ahead with fracking, and what protections were needed. They were proactive. In the United States, we usually let these projects go live and then we backfill, which makes it challenging to address the issues later. Ideally, we would conduct prospective analysis of costs and benefits, so we can mitigate possible negative outcomes."

That's what Baka is trying to do with her next big project; looking at the emerging petrochemicals industry outside of Pittsburgh which may affect an area as large as the entirety of Appalachian rural America.

"The ethane cracker plant will use byproducts from shale gas

extraction to manufacture plastics. Pennsylvania wooed Shell to build the cracker plant in Pennsylvania by giving a \$1.65 billion tax break—the largest in state history. We have been conducting preliminary research on the plant for the last year with seed funding from Penn State's Institutes of Energy and Environment and the John T. Ryan EMS Faculty Fellowship. I am currently working with an interdisciplinary team of geography and law students to set up a political-industrial ecology analysis of the plant," Baka said.

Over the past year, they have mapped out the system of the plant, from the shale gas wells, to the pipelines to the cracker plant, to the consumer end-use, and finally to the plastic pollution. "We are using this data to ask: What are the material and energy flows through the whole system? What are the environmental impacts of the system and how do these impacts vary across time and space? How are those flows regulated across different political scales—federal, state, county, municipal?" she said.

Going forward, Baka is applying for additional grants "to evaluate the fitness of the current regulatory structure, specifically whether the regulatory structure adequately addresses community concerns and helps to mitigate environmental impacts." To better inform her work in the Pittsburgh area, she also wants to evaluate similar plants that are already operating in Kentucky, Texas, and Louisiana.

"One key area of concern that we have observed in our preliminary research is the potential public health

*See BAKA, p. 22*



# Female firefighters who can be an American

**By Lorraine Dowler**

Originally published in *The Conversation*.

**F**ive women graduated from New York City's Fire Academy on April 18, bringing the number of women serving in the Fire Department of New York (FDNY) to seventy-two—the highest in its history.

The FDNY's 2018 graduating class also includes the first son to follow his mother into the profession. She was one of the forty-one women hired in 1982 after the department lost a gender discrimination lawsuit and was ordered to add qualified women to the force.

Despite these milestones, women still make up less than 1 percent of New York's 11,000 firefighters. The city trails Minneapolis,

San Francisco, Seattle, and Miami, where in recent years fire squads have been more than 10 percent female. The national average hovers around 5 percent.

Approximately 10,300 women nationwide worked as full-time firefighters in 2016, according to the most recent data available from the Department of Labor. In 1983, there were just 1,700.

These women are on the front lines, fighting fires, helping victims of natural disasters, and combating terrorism.

I interviewed more than one hundred female firefighters for an academic study of women in traditionally male industries.

My research reveals how women are changing firehouse culture and transforming how Americans see heroism.

## Two centuries of service

Women have been putting out fires in the United States for 200 years.

In 1815, Molly Williams joined New York City's Oceanus Engine Company 11. Williams was a black woman enslaved by a wealthy New York merchant who volunteered at the firehouse. Williams would accompany the merchant to the station to cook and clean for the all-white, all-male crew.

One evening, the alarm rang at Oceanus 11. The men were incapacitated by the flu, so Williams grabbed the hand-pumped hose and answered the call alone. Her strength so impressed the men that they offered her a job.

In 1926, 50-year-old Emma Vernell became New Jersey's first female firefighter when her







# defy old ideas of can hero

*Image: United Women Firefighters*

husband, Harry, a volunteer fireman in the town of Red Bank, died in the line of duty.

Many more women took their husbands' places in America's volunteer fire service during World War II. By the mid-1940s, two Illinois military fire departments were "manned" entirely by women.

But the profession really opened up to women after the passage of the 1964 Civil Rights Act, which made it illegal for employers to discriminate against applicants based on sex, race, religion, or nationality.

## **Strong, brave, and invisible**

Despite this history, I still hear claims that affirmative action for female firefighters is diluting standards and putting communities at risk.

Even my liberal colleagues have asked me whether women can really carry an unconscious victim out of a fire while wearing one hundred pounds of gear.

The answer is yes. In 2008, almost 70 percent of all aspiring female firefighters passed the national Candidate Physical Abilities Test, which tests for endurance, strength, and cardiovascular health. The same year, 75 percent of male applicants passed.

Female success rates rise when departments offer specialized preparation programs for women to work out together, get hands-on experience with firefighting equipment, and follow individualized strength-training routines.

Critics have suggested to me that there aren't

more female firefighters because women are not interested in such a dangerous and "dirty" job.

Yet women are in fields that require a comparable level of strength and stamina, including drywall installation, logging and welding—though they remain minorities.

Women have also made more inroads in other historically male-dominated careers like aerospace engineering and medicine.

## **Fear of change**

So why are just 5 percent of firefighters female?

Based on research on gender integration in the U.S. military, I believe the main obstacle facing women in firefighting is its traditional culture.

*See FIRE, p. 21*



# Seed grant supports c in (xR) immersive tech

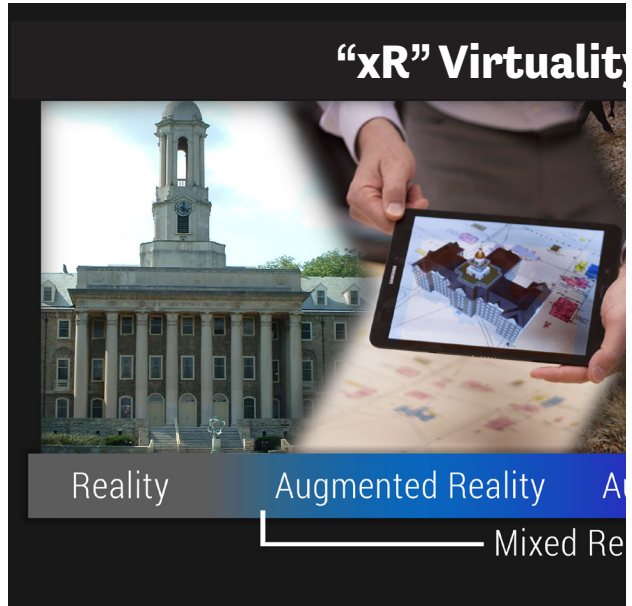
**A** transdisciplinary research team, led by Alexander Klippel, professor of geography and Gosnell Senior Faculty Scholar, received one of ten seed grants to pilot programs that support Penn State's 2016–2020 Strategic Plan. The proposal is titled, "Digital Innovation through Immersive Technologies: Establishing New Paradigms for Environmental Decision Support."

The project primarily supports the thematic priority, Driving Digital Innovation, and also addresses three other themes: Advancing the Arts and Humanities, Stewarding our Planet's Resources, and Transforming Education. The goal is to demonstrate the potential that immersive technologies offer for all academic disciplines, but with a focus on environmental communication.

Klippel has been working with immersive technologies for several years, launching projects within ChoroPhronesis, his research laboratory, and collaborating with faculty across Penn State and other institutions.

"There is a network of faculty here at Penn State who are enthusiastic about immersive technologies. And that fits nicely with the University's strategic plan," Klippel said.

"Just take a moment to realize that we can provide access to any place on earth at any point in time from the bottom of the ocean to boreal forest in central Asia, from the height of Mayan civilization to the future of Centre County under various climate change scenarios," Klippel said. "We'll be able to deliver fully immersive, embodied experiences that interactively allow for accessing all information available about a place, and understanding it in



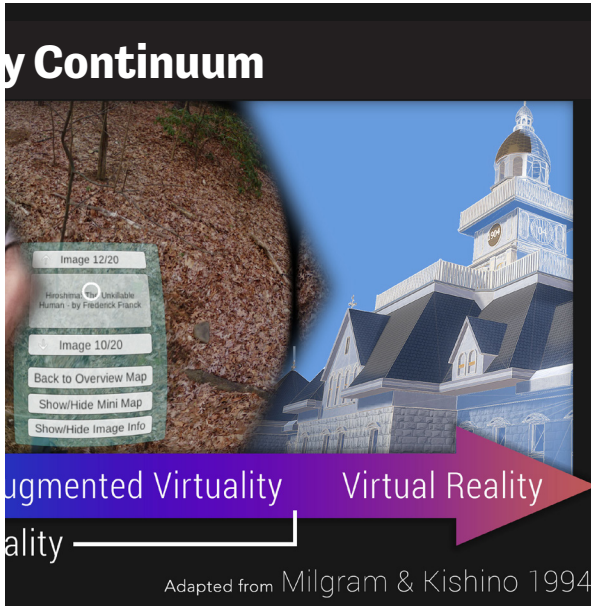
context. Through expanding physical reality to open people's minds, we can facilitate adopting critical, previously impossible, perspectives." Klippel said that his lab has been using virtual reality (VR) for a long time for behavioral experiments because it allows for controlling critical environmental characteristics.

"In 2014 it became clear that VR would become a medium for mass communications," Klippel said.

S. Shyam Sundar, distinguished professor and co-director of the Media Effects Research Laboratory in the Donald P. Bellisario College of Communications, has also been conducting research along these lines. "I see this modality of communication growing by leaps and bounds in the next decade. It will soon dominate the way we experience media. Just like television ushered in a new way of experiencing the real world compared to simply reading about it via newspapers or hearing about it on the radio, VR will change the game."

The term "xR" is now being used to represent the continuum of the concepts and technologies, from

# collaborative research technologies



augmented reality to mixed reality to virtuality, Klippel said.

“xR is not new. What is new is the fact that every technology company (e.g., Google, Apple, Samsung) is investing heavily in it and creating a new industry that will transform every aspect of human life.”

“Immersive virtual technology has developed in lightning speed in the past five years, partly due to advances in understanding the important spatial visual features in the environment and the industry’s ability to implement this understanding into their technology,” said Ping Li, professor of psychology and linguistics, co-director, Center for Brain, Behavior, and Cognition, and associate director, Institute for CyberScience.

Klippel describes how xR can be used for teaching. “If you want to teach your students about the structure inside a volcano, or the ecology on the bottom of the ocean, or the gravity on the surface of Mars, you can assign a reading or show a video; but now, you can also take them on a virtual field trip and give them an immersive, embodied experience that is tremendously

more powerful and empirically proven to foster understanding and learning,” Klippel said.

“It is a medium that allows almost a full sensory immersion. It also allows for exploring at completely different scales yet still with all the benefits of an embodied experience. Think of the films, *Fantastic Voyage* (1966) or *Ant-man* (2015), an xR lesson can allow the student to shrink to the size of a molecule or become a giant who lifts the top off a mountain to see the geologic structure inside.”

Sundar’s research on VR has shown the implications of this. “Immersive technologies are changing the nature of media by introducing a new

modality of communication, namely a virtual space to which users can be transported and allowed to explore on their own. Unlike moving a keyboard button or joystick, users are able to explore the space by turning their heads and waving their arms. Our research has found this to be an effective way of telling stories about distant lands and peoples, by giving users a greater sense of ‘presence’ and a feeling of ‘being there’ in the portrayed environment. We found that VR also increases empathy for characters in the stories,” said Sundar.

Immersive technologies are not only improving education and research, they are also becoming a critical part of any kind of training from fork lifts to submarines, Klippel said. They allow for reducing stage fright and treating PTSD.

“Ultimately they will be able to permeate our daily lives, allowing for better decision-making from selecting furniture to hairstyles, but also for planning for sustainable communities and understanding climate change at the very local level,” said Klippel.

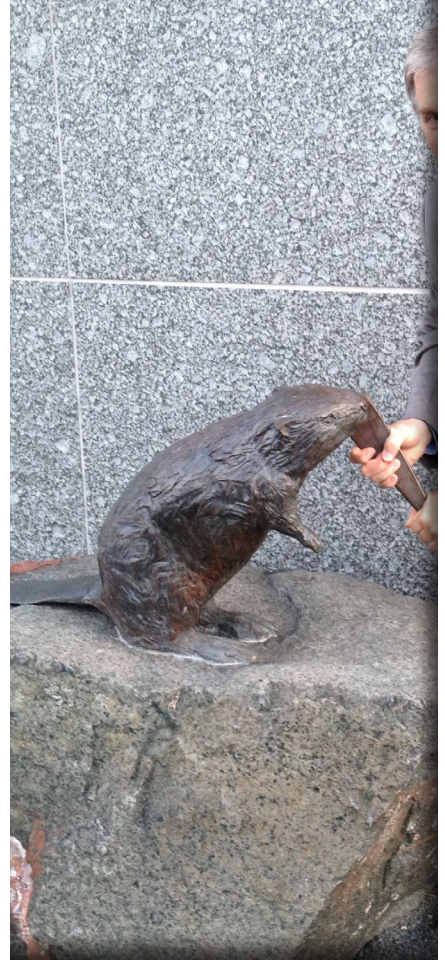
See *VIRTUAL*, p. 20



During the early 1980s, I was a master's student at East Stroudsburg University and also coordinating a project to restore river otters in Pennsylvania. On a cold fall night in 1982, a large, somewhat contentious, local audience had gathered at the Cross Fork fire station in northcentral Pennsylvania to hear me review controversial aspects of the project. In the back of the room was a tall, thin, young man with black hair and a mustache, who stood out as not "typical" for this audience. After my presentation, this young man approached me, thoughtfully indicated that he appreciated the way I handled the meeting, and asked me to contact him to be my adviser if I was ever considering a Ph.D. program. At the time, I had never given thought to pursuing a Ph.D. or a career in academia. The kind and considerate young man offering me such a wonderful opportunity was Rob Brooks, and, in 1986 I became Rob's Ph.D. student. Ultimately, my first meeting with Rob, at a fire station in remote northcentral Pennsylvania, positively changed the entire focus of my professional life. I am forever grateful for that first, unexpected meeting with Rob and the wonderful interactions we have since shared. —**Thomas L. Serfass '94g Wildlife and Fisheries Science**

**It's rare to meet someone** as remarkably accomplished as Rob who is also so approachable and grounded. His kind encouragement and genuine, unwavering optimism were vital to pushing me through even the most overwhelming of research challenges. During Riparia lab meetings, I always appreciated how forthright he was with the fact that he still grappled with concepts and projects too. It taught me that the process of working through a problem is universal, from the greenest of graduate students up to the most distinguished of professors, and I will always be grateful for the way in which Rob has embraced that as just another part of the job. I am so fortunate to have been under his wing during my time at Penn State and to have been able to work with the family he has built within Riparia—what a wonderful legacy he leaves in his place as he moves onto this next part of his career! —**Claire Hirt '16 Geography**

## Q&A with Ro



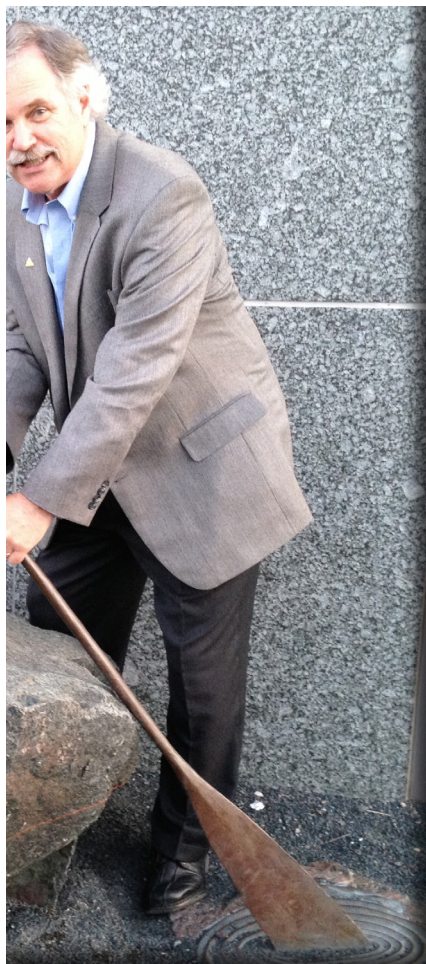
*"It's time to let go." Robert Brooks wrest Minnesota, while attending a Society of*

**R**obert Brooks retires at the end of August 2018 after thirty-eight years of service at Penn State (Twenty-five years as founder and director of Riparia and fifteen years in geography).

*Q: What made you want to become a geographer/ecologist?*

**A:** Ever since I was about 5 years old I've been fascinated by the natural world—learning the names of animals and plants; exploring small streams and wetlands; and reading tales from wilderness experiences. My friends and I would look at picture books of

# bert Brooks



ling with a beaver (statue) in Duluth,  
'Wetland Scientists conference.

**Rob is a thought leader** in wetland science on several topics, but what has resonated most with me are his views on integrated riparian ecosystems. In the worlds of regulation, assessment, and still to a high degree, in research—three worlds that Rob has straddled throughout his career—wetlands, streams, and floodplains are typically treated as discrete entities. Trying to understand them as interacting parts of an integrated system in the landscape with sometimes crisp and sometimes blurry boundaries is a continuing challenge in our field, and Rob has pushed the boundaries of this dialogue and continually directed the field's attention to advancing this integration and line of inquiry. But beyond his intellectual contributions and his deep dedication to the field, Rob is just a good, decent person. He treats people with respect. He's a good listener. When given the chance to say something negative about someone, and it doesn't serve a bigger purpose, he generally keeps his mouth shut. Kids flock to him. Whenever I go to meetings and mention Rob's name peoples' faces light up, and they earnestly ask, "How's Rob?" He's consistently genuine, fair, deeply kind, fun, and warm no matter the setting—doing field work, hosting parties, teaching, directing multi-institution research projects, advising. He handles himself with integrity and enthusiasm and inspires his students and others to do the same. —**Kristen Hychka '04 Wildlife and Fisheries Science, '10G Geography**

animals with maps of far off places, such as Australia and Africa, and memorize the species that lived there. It wasn't until high school and my camping experiences in Scouting that I learned about ecology as a profession. In graduate school at the University of Massachusetts, I transitioned into the applied field of wildlife biology and management, working with aquatic mammals (beaver, muskrat, otter) that eventually led me to combine wildlife biology and wetlands science for my career. At Penn State, I spent three years at Penn State DuBois in wildlife technology, moved to University Park in wildlife and fisheries science for another twenty years, and then joined the Department of Geography

in the College of Earth and Mineral Sciences where we could learn more about landscape ecology and spatial thinking.

*Q: Why did the study and protection of wetlands appeal to you?*

A: I believe the dynamics of water fascinates most people—the flow of a river, the concentric rings of a water drop on a pond's surface, or the patterns formed by water and aquatic plants—think Monet. Water in its many forms certainly drew me in, to damming up small streams, to scooping out crazy critters from the water, to paddling canoes, then kayaks, on rivers, lakes, and seas. So in the 1960s and 1970s when it

*See BROOKS, p. 20*

# Community updates

## UNDERGRADUATE

The Penn State **GIS Coalition** was accepted as a YouthMappers chapter.

**Courtney Rome** won first place in the College of Earth and Mineral Sciences Undergraduate Poster Exhibition with her poster, "Food for Thought: Differences of Geographic Food Habits between Alaska and the Lower 48." Project advisers: Michael Nassry and Denice Wardrop.

**Luba Hristova, Danielle Ruffe, and Sabrina Yu Zhong** won third place in the College of Earth and Mineral Sciences Undergraduate Poster Exhibition with their poster, "Fresno, California: Drought Impacts on Agriculture." Project adviser: Guido Cervone.

## GRADUATE

**Roxanne Ahmadi, Jace Ebben, and Travis Meyer** were awarded U.S. Geospatial Intelligence Foundation (USGIF) scholarships.

**Cary Anderson** won the American Association of Geographers (AAG) Cartography Specialty Group's Illustrated Paper Award for her work on assessing emotional reactions to different map designs.

**Megan Baumann** received a Global Programs Travel Grant to present research at the Conference of Latin Americanist Geographers (CLAG) in

May in Costa Rica. Her paper is titled, "Living a Callejera Methodology: Grounding Lugones' Streetwalker Theorizing in a Feminist Decolonial Praxis."

**Megan Baumann and Kelsey Brain** organized a panel on "Intersectionality and Coloniality in Human-Environment Geography: Empirical Contributions to Feminist Theory from Latin America," at the CLAG in May in Costa Rica.

**Kelsey Brain** was awarded a Fulbright-Hays Doctoral Dissertation Research Abroad grant to continue her dissertation research in Costa Rica.

**Carolyn Fish** received a U.S. Geospatial Intelligence Foundation Graduate Scholarship.

**Carolyn Fish** accepted a tenure-track assistant professor position in the Department of Geography at the University of Oregon.

**Zach Goldberg** received a research grant from Penn State's Africana Research Center for his project, "Organic Certification of Fig Production in Ouezzane Province, Morocco: Assessing Social and Cultural Impact."

**Russell Hedberg** accepted a tenure-track assistant professor position in sustainability in the Department of Geography-

Earth Sciences at Shippensburg University, where he will also be serving as the University's sustainability coordinator.

**Mikael Hiestand and Andrew Yoder** passed the FAA Aeronautical Knowledge Test, receiving their FAA Part 107 Remote Pilot Certificates, and are now able to legally fly small unmanned aircraft under Section 107 rules.

**Eun-Kyeong Kim** started her postdoctoral fellowship at the University of Zurich, Switzerland in spring 2018.

**Eden Kinkaid and Lise Nelson** have a book chapter forthcoming in *The Routledge International Handbook of Gender and Feminist Geographies*. The chapter is titled "On the Subject of Performativity: Judith Butler's Influence in Geography."

**Adrienne Kramer (nee Tucker)** accepted a job as a senior GIS analyst at the International Association of Fire Fighters.

**Tara Mazurczyk** won Best in Show at the Bellefonte Arts & Crafts Fair held August 12-13, 2017.

**Elli Nasr Azadani** was recognized by the North American Association for Environmental Education as one of their "Environmental

*See COMMUNITY p. 18*





## MGIS students study abroad while studying online

**By Adrienne Goldsberry**

When you think of online education, do you think of study abroad programs? Probably not. But this summer, for the second time, graduate students in Penn State's online Master of Geographic Information Systems (MGIS) program offered by Penn State World Campus in collaboration with the Department of Geography studied abroad in Europe.

The course, GEOG 597G: Challenges in Global Geospatial Analytics, is the first Penn State World Campus online graduate course that includes a travel component embedded into the curriculum. Faculty members Beth King and Fritz Kessler were the instructors.

So how does it work? During the first two weeks of the eight-week course, students collaborate online and perform background research. Then they travel to Europe, where this year's group spent one week visiting various universities and mapping agencies in Luxembourg, France, Belgium, and the Netherlands, and a second week collaborating with researchers at ITC, part of the University of Twente in the Netherlands.

ITC is an internationally recognized research group in the geospatial sciences that focuses on problem-

solving research for complex global challenges ([www.itc.nl/about-itc/#education](http://www.itc.nl/about-itc/#education)).

The final four weeks of the course take place online, where student collaboration groups finalize project proposals and present them to each other for peer review. This year's research project involved mapping spatial patterns in refugee data, recognizing that refugee issues are consistently at the forefront of world news and events.

"It's been amazing to meet and work with other MGIS students in person while traveling across Europe," said GEOG 597G graduate student Tim Ultee. "The tremendous diversity of backgrounds and perspectives has been invaluable to my learning experience, and spending lots of time traveling together has afforded me the opportunity to build professional and personal connections."

GEOG 597G provides an opportunity to create a new model for teaching and performing research in the online learning environment at the graduate level. It will be offered every other year, and with each offering faculty members in the online geospatial education program will continue to refine the curriculum to improve this model. This course is an important feature of what makes Penn State's online geospatial education program unique and impactful.

## COMMUNITY from p. 16

Education 30 Under 30” for 2017. The program recognizes individuals in the United States and around the globe, 30 years of age or younger, who are game changers in their communities.

### **Aparna Parikh**

accepted a Mellon Postdoctoral Fellowship from the Leslie Center for the Humanities at Dartmouth College and will be housed in their Department of Geography.

### **Aparna Parikh**

has a chapter titled “Gendered Household Expectations: Neoliberal Policies, Graveyard Shifts, and Women’s Responsibilities in Mumbai, India” in the recently published book, *Modernity, Space, and Gender*.

**Julie Sanchez** won the Best Student Paper Award from the Polar Geography Specialty Group at the 2018 AAG annual meeting in New Orleans.

**Julie Sanchez** received a Graduate Research Fellowship from the Pennsylvania Space Grant Consortium.

**Nari Senanayake** accepted a tenure-track assistant professor position in the Department of Geography at the University of Kentucky.

**Sam Stehle** started a position as a postdoctoral researcher in the National Centre for Geocomputation at Maynooth University near Dublin, Ireland.

**Jiayan Zhao** won first place in the Saarinen Student Paper

Competition awarded by Environmental Perception and Behavioral Geography (EPBG) Specialty Group at the 2018 AAG annual meeting.

## FACULTY and STAFF

**Clio Andris** won the 2017–18 Emerging Scholar Award from the Regional Development and Planning Specialty Group of AAG.

**Jennifer Baka** was awarded the Ryan Faculty Fellowship by the College of Earth and Mineral Sciences for 2017–20.

**Justine Blanford** was elected to serve as a director for the University Consortium of Geographic Information Science (UCGIS).

**Justine Blanford** was selected as a member of the inaugural cohort for TRELIS (Training and Retaining Leaders in STEM-Geospatial Sciences), professional development for women in the geospatial sciences in higher education.

**Guido Cervone** and Penn State colleagues received a seed grant for “Multi-Scale Estimates of Solar Power Water Stress by Integrating Process-Based Descriptions with Deep-Learning-Based Mapping of Solar Farms” from Penn State’s Institutes of Energy and the Environment.

**Guido Cervone** was named to the Board on Behavioral, Cognitive, and Sensory Sciences at

the National Academy of Sciences.

**Sarah Chamberlain’s** book, *Field Guide to Grasses of the Mid-Atlantic*, has been published by Penn State University Press.

**William Easterling III**, professor of geography and former dean of the College of Earth and Mineral Sciences, was elected a 2018 Fellow of the American Meteorological Society.

**Chris Fowler** was promoted to associate professor.

**Joshua Inwood** delivered the inaugural Liberal Arts First-Year Valedictory Address at Penn State.

**Joshua Inwood** participated in the first-ever “Rock the News” podcast about everyday ethics.

**Brian King’s** book, *States of Disease: Political Environments and Human Health*, received the Julian Minghi Distinguished Book Award from the Political Geography Specialty Group of AAG.

**Lise Nelson** was selected as a Resident Fellow for the Humanities Institute at Penn State for fall 2018.

**Danielle Oprean**, postdoctoral researcher in ChoroPhronesis, accepted a position at the University of Missouri in the School of Information and Learning Technologies. She began her tenure-track faculty position in August 2018.

**Hari Osofsky’s** *Emory Law Journal* article,

***We always want to know where you are in life.  
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“Energy Partisanship,” (with University of Melbourne’s Jacqueline Peel) was awarded the 2018 Morrison Prize, which recognizes the most impactful sustainability-related legal academic article published in North America during the previous year.

**Erica Smithwick** participated in two of four WPSU-TV projects that received Telly Awards: “Managing Risk in a Changing Climate,” which received a bronze in the Television - Public Interest/Awareness category and “Women in Science Profiles,” which received a bronze in the Online – General Education category.

**Erica Smithwick** was promoted to professor.

**Emily Rosenman** won the best dissertation award from the Urban Geography Specialty Group in 2018.

**Missy Weaver** is back as the undergraduate administrative assistant. She returned on Monday, November 6, 2017.

#### ALUMNI

**Mark Monmonier** ’67g, ’69g published a new book, *Patents and Cartographic Inventions: A New Perspective for Map History*.

**Wayne Brew** ’81, assistant professor of geography at Montgomery County Community College in Pennsylvania, was

granted a sabbatical for fall 2017, and embarked on a long road trip.

**Tony Greulich** ’96 was recently promoted to the position of planner IV in the Development Review and Design Division of the Department of Planning for Henrico County, Virginia. He credits Roger Downs with setting him on the right career path.

**Frank Boscoe** ’00g was interviewed for the AAG career profiles page.

**Mark Read** ’02g, ’14g assumed duties as the head of the Department of Geography and Environmental Engineering, one of the thirteen academic departments at the U.S. Military Academy.

**Sterling Quinn** ’09g, ’16g and undergraduate student **Doran Tucker** co-authored an article “How Geopolitical Conflict Shapes the Mass-Produced Online Map,” appearing in the open access journal, *First Monday*.

After nearly eight years with Esri, **Mark Smithgall** ’09 started a new position as a GIS administrator for Anadarko Petroleum Corporation.

**Tim Yuskavage** ’11 received his master of arts degree from the Security Studies Program at Georgetown University in May 2018. He continues to work for the U.S. government as an analyst.

**Mallory Henig** ’12 started a career with Conservation International at their headquarters in Arlington, Virginia as a development coordinator.

**Peter Howe** ’12g was awarded an NSF CAREER grant from the Geography and Spatial Sciences program. The five-year project is titled “CAREER: Location-Aware Social Science for Adaptation: Modeling Dynamic Patterns in Public Perceptions and Behavior.”

**Loren Pfau** ’13g and **Justine Blanford** have published “Use of Geospatial Data and Technology for Wilderness Search and Rescue by Non-Profit Organizations” in *The Professional Geographer*.

**Siddharth Pandey** ’14 was selected to be in *xyHT Magazine’s* “40 under 40 list for Remarkable Geospatial Professionals” in their January 2018 edition.

**Joshua Stevens** @jscarto was recognized as one of fifty Must-Follow Twitter Accounts for Geospatial, Data Science, and Visualization.

**Jase Bernhardt** ’16g, now an assistant professor in the Department of Geology, Environment and Sustainability at Hofstra University, was elected director of the AAG Climate Specialty Group.



*BROOKS, from p. 15*

became apparent we were polluting our life-giving waters, and all that depended upon them, I was upset, and began in small ways doing what I could to learn about them and protect them.

*Q: What would you say is your most gratifying project or achievement during your career?*

A: There are many aspects of my career of which I am proud—continuity and focus on a diversity of conservation science studies researching many aspects of wetlands and wildlife for four decades; reintroducing species such as river otters and fishers back into Pennsylvania; building trust among a network of working professionals—but the singular, most gratifying achievement is recruiting, advising, and watching all of the graduate students (forty-six and counting!) complete their degrees and move into exciting careers and lives making a difference.

*Q: What are some of the most important changes you've seen in either the discipline of geography or in higher education?*

A: Over my career, academia has moved toward more specialization. Not that everyone was a generalist, but there has been growth in subdisciplines, blending of disciplines, and most notably, a proliferation of journals and other

communication outlets. Another dramatic change has been the digitization of both professional and personal lives. Information flows faster and faster. This has benefitted aspects of geography, and related fields, such as landscape ecology, habitat mapping, use of remote-sensing imagery. Knowledge, however, I believe stems from deeper thinking and reflection, both of which are in short supply these days.

*Q: How have your research interests evolved or changed over your career?*

A: I began my graduate work as a wildlife biologist focused on applied field studies in natural resources. The emphasis was on populations, habitats, and environmental issues. Since I was working on aquatic and wetland species, I was invited to volunteer on a local conservation commission and be in charge of wetland permitting. That led to further understanding of environmental laws, regulations, and policies at local, state, federal, and eventually, international levels. To fully comprehend wetlands from scientific and policy perspectives requires an interdisciplinary approach, so learning about hydrology, soils, water chemistry, restoration ecology, agency missions, and other topics was necessary. I find exploring the boundaries between disciplines stimulating, and geography has plenty of boundaries to explore.

*VIRTUAL, from p. 13*

Klaus Keller, professor of geosciences, sees this application in his research as well. “Immersive technology has already made important differences in my research. For example, I have used it with high dimensional data sets that characterize trade-offs between different objectives in the design of climate risk management strategies. Understanding and communicating these trade-offs is very challenging when using the standard two-dimensional projections. Using immersive technology, in collaboration with researchers from Dr. Klippel’s research group, enabled important new insights that have informed new research directions and the design of decision support systems,” said Keller.

Some of the pilot project goals include creating a prototype immersive VR theater;

*Robert Brooks is the Ruby S. and E. Willard Miller Professor of Geography and Ecology, as well as a Fellow of the Society of Wetland Scientists, Certified Professional Wetland Scientist, and Certified Wildlife Biologist. He will be Professor Emeritus beginning August 2018.*

developing a repository of knowledge on immersive technologies; and investigating and disseminating research-based best practices for using xR in research, education, and service.

“I think this project will help the University see the potential of this technology and will indeed change every aspect of academic life from teaching to service to outreach,” Klippel said. “As a seed grant, it is meant to bring people together with the goal to write bigger and bigger grants, and that is already happening. There are a lot of funding opportunities.”

What is the future of immersive technologies or “xR”? Keller and Li said they anticipate combining it with big data to transform teaching, learning, research, and decision-making.

More information about all the funded proposals and their authors is available at <http://strategicplan.psu.edu/funded-initiatives>.

### *FIRE, from p. 11*

Like soldiers, firefighters are viewed as proud warriors working on dangerous front lines. That image comes with powerful stereotypes about who’s best suited to do the work. Female soldiers and firefighters both challenge a cultural standard that men are heroes and women are onlookers, even victims.

The military first added

women to its ranks in 1948. In December 2015, Secretary of Defense Ash Carter lifted the ban on women in combat roles—as long as they qualify and meet the standards—despite opposition from the Marines.

Today, women still account for just 15 percent of active military personnel.

Firefighting too is a traditional field. Over the past decade, numerous departments have been found guilty of discriminating against applicants of color and ordered to retool entrance testing that had a disparate impact based on race.

Women are in some ways even more disruptive newcomers to firefighting because they entirely upend societal gender norms.

#### **Workplace harassment**

Interviewees have told me they face severe harassment on the job.

One found her oxygen tank drained. Another confided that her male colleagues are so hostile she fears they’ll leave her alone in a fire.

Female firefighters also contend with ill-fitting gear. The long fingers of male gloves affect their grip, they report. Boots and coats are too large. Oversized breathing masks push their loose helmets forward, blocking their vision during fires.

Station houses often lack private spaces for women, including bathrooms, changing areas and dormitories.

In 2016, thirty-four years after women

joined New York City’s fire department, the city boasted that all of its 214 active firehouses finally had gender-separated facilities. For three decades, some of New York’s bravest went to the bathroom in neighborhood diners. Many others just went ahead and used the men’s room.

#### **Women winning**

Female firefighters are succeeding anyway.

Several hundred have risen to the level of lieutenant or captain. Another 150 hold the highest rank, fire chief. That includes Chief JoAnne Hayes-White, whose historic 2004 hiring made San Francisco the world’s largest urban fire department led by a woman.

Meanwhile, these women are transforming how Americans imagine heroism.

One Wisconsin firefighter said people are surprised when her all-female crew pulls up to a blaze. But, she told me, “No one cares if you’re a woman when their house is on fire.”

A woman in San Francisco said she intentionally stands outside the station during down time so that neighborhood children realize that black women can be firefighters.

“You have to see it to be it,” she said.

Read the original article online at <https://theconversation.com/female-firefighters-defy-old-ideas-of-who-can-be-an-american-hero-95342>.



*BAKA, from p. 9*

impacts from the cracker plant. The plant will release volatile organic compounds (VOCs) as a waste product of the refining process. These toxins will be locally concentrated in the area surrounding the plant, which already suffers from poor air quality due to the industrial history of the region. Yet, supporters of the plant argue that the plant is necessary because it will help bring much needed jobs to the region,” Baka said, adding, “the Shell cracker plant presents the opportunity to evaluate how to weigh environmental costs and economic benefits of energy development. This is perhaps one of the longest standing challenges and controversies in environmental policy making and I’m looking forward to shedding new light on the topic.”

She’s also looking forward to involving graduate students in her research project.

“I am seeking students who are interested in helping to develop this (re) emergent field of energy

geographies by looking at the fracking and biofuels space and other energy systems domestically and internationally. I am interested in students who are deeply interested in studying energy systems in different parts of the world and in trying to unravel the different connections among our different resource systems. Energy touches so many parts of our lives,” Baka said.

“There is no such thing as a silver bullet answer for a sustainable energy future, but I think that a diverse energy supply is the best approach. It would reduce supply shocks as well as the impact on individual stakeholders. We need to have both fossil fuels as well as renewables in the mix,” Baka said. “And people need to know where their energy comes from, to use just what they need for their daily activities, and to be aware of the environmental impacts of energy consumption.”

*LEWIS, from p. 5*

“Of course,” remarked Professor Lewis when I told him how much I’d gained from that. “You discovered the world on your own. It’s the same deal with maps in class—when students have a map in hand, own it, mark on it, they discover that a map isn’t just something out there behind Dan Rather’s head; the best thing is when they can get out there in the world and see what it is they’re learning about. That’s why I like geography. I like to do what’s called ‘guided discovery’—showing them how to learn about things.”

“It took me a couple of months after the class ended not to constantly analyze the architectural styles of every house we passed,”

Stacy Nestleroth agreed. “‘Look!’ I’d exclaim to my bewildered parents, ‘it’s another Sears Roebuck cube! And there’s a mansard roof on that building!’ I’m sure they got pretty sick of it. I don’t do that as much any more, but the principles of looking beyond the surface have stayed with me. I see the world a lot differently now.”

Gazze was particularly impressed that Lewis was more concerned with the quality of your work than the mere processing of information to meet a deadline. “In GEOG 404: The American Scene II, I really struggled getting my final paper done. Professor Lewis deferred my grade through the summer, when I had a chance to

go out to California and actually look at the stuff I was studying. That made a huge difference in what I could produce.”

“The atmosphere of every class is different,” the professor admits.

“Some are perfectly wretched, while others are a fabulous success. In one of the first couple of classes I taught—back in the Ice Age, that is— I gave the students my own course evaluation. Their general reaction was, ‘You’re O.K., Lewis, but you’re far too sarcastic.’ So I started listening to myself, and I realized they were right. I wouldn’t want to do anything else,” Lewis said, grinning. “And the Commonwealth of Pennsylvania is even paying me to do this!”







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