department of
GEOGRAPHY &
GEOGRAPHIC INFORMATION SCIENCE

UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN | COLLEGE OF LIBERAL ARTS & SCIENCES

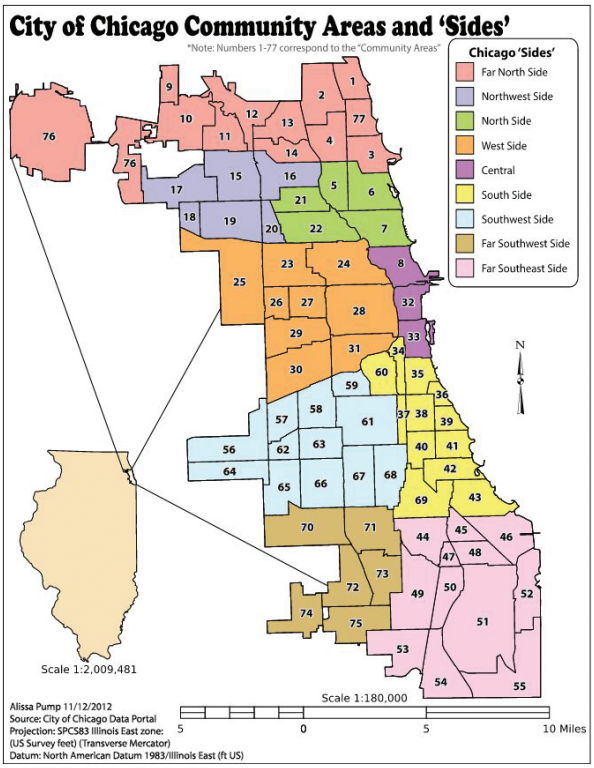
WINTER 2013

New Faculty and Curriculum Enhance Department

We have changed our name! After considerable discussion and a one-year process of approval that began in March 2011, we are now the Department of Geography and Geographic Information Science. The new name for our undergraduate major—geography and geographic information science—was also approved. Beginning in May 2013, this degree title will appear on student transcripts. Meanwhile, our MA, MS, and PhD degrees will retain the title of geography.

Why change the name of the department? The development of revolutionary new technologies for managing, processing and analyzing geographically distributed information has increased dramatically over the past several decades, fueling a new field of knowledge and study— geographic information science (GIScience). The focus of GIScience includes several knowledge domains including: spatial analytical methods, conceptual (cognitive and social) foundations of spatial information processing, geovisualization and mapping, data modeling and manipulation, geocomputational modeling, and geospatial technology and society. Moreover, GIScience is becoming a critical component of global cyberinfrastructure, leading to the rise of CyberGIS. GIScience is now recognized as a distinctive field of geography, and accordingly students interested in this field are seeking a more GIScience-focused curriculum.

Our department has been steadily expanding its mission to include the research and teaching of GIScience, and has gradually developed curricula at the undergraduate and graduate levels focusing on GIScience. Thanks to the work of Professor Shaowen Wang, our department is at the frontier of GIScience research. Dr. Wang is leading a major National Science Foundation-funded initiative that will develop and integrate CyberGIS software to enable geospatial innovation. Last January we hired Dr. Jonathan Greenberg, an expert in remote sensing of land cover and vegetation, as a new assistant professor in our GIScience program.



Geography and GIS student Alissa Pump created this image for Heath Robinson's course "Geography 473: Map Compilation and Construction."

Dr. Greenberg is currently teaching advanced courses in remote sensing and spatial programming. In addition, Dr. Heath Robinson joined our faculty this summer as a lecturer, to teach our first online course offering: "Introduction to Geographic Information Systems." Dr. Robinson also will be teaching several important courses in our GIScience curriculum, including online courses.

Why change the name of our undergraduate major? First and foremost, the change in the name of the major maintains consistency with the changing emphasis of research, education, and service in the department to include geographic information science (as reflected in our departmental name change). By retaining geography in the name of the major, we also are accommodating other concentrations in our major (general geography, human geography, physical geography) that are not specifically focused on GIScience, but that connect to it in important ways. A second goal of the name change is to rebrand the major to attract new majors who are specifically seeking an academic program in GIScience.

Over the past decade, the demand for employment in GIScience has grown enormously. According to the U.S. Department of Labor, the geospatial industry is one of the three most important and fastest growing employment fields in the United States. Current demand for GIScience professionals in the public and private sectors exceeds the supply and this situation is anticipated to exist well into the future. The University Consortium for Geographic Information Science has identified a clear need for more university programs in GIScience to meet this demand as students seek opportunities for university-level training in GIScience to pursue careers as GIScience professionals. We have established a rigorous curriculum for undergraduate majors who want to focus on GIScience. By renaming the major, we will increase our visibility as an educational center of excellence in GIScience, providing majors with a degree that clearly identifies their training in this important field. Through the name change, the department is being responsive to trends within the broader academic discipline, to changing student needs, and to emerging professional opportunities.

Message From the Head

Dear Friends,

I am honored and thrilled to be the new department head in the newly renamed Department of Geography and Geographic Information Science. The name is quite a mouthful, so we often abbreviate it as Geography and GIS, or just GGIS. We have also changed the name of the undergraduate major to GGIS and are revising the undergraduate curriculum accordingly; moves that we anticipate will create exciting new opportunities for undergraduate students. Although there is a lot of "new" in the department, our geography core remains a strong and central focus. We continue to award masters and PhD degrees in geography, and new faculty appointments in the past decade have greatly strengthened our core programs. Geography at the University of Illinois is renowned internationally and here on campus for its high-quality, innovative, research activities and its excellent graduate programs.

All of these exciting transformations emerged under the leadership of Professor Bruce Rhoads who served as department head for the past decade. Bruce brought incredible vision, energy, and direction to the department, and his efforts are visible everywhere in the department's fabric. On behalf of all of us, thank you to Bruce for your extraordinary leadership and service.

I hope you will enjoy learning more about our department and join us in celebrating the department's many important traditions and innovative new directions. One of my priorities as head is to develop stronger ties with our diverse and accomplished alumni community. I would love to hear from you! You can contact me at smclaff@illinois.edu.

—Sara McLafferty

Message from the Previous Head

After careful thought, I decided last fall that it was time for me to step down and let someone else in the department take on the responsibility of serving as head. After informing the dean of my decision, a process was initiated to choose a new head. While many in the department are capable of leadership, I was especially pleased with the dean's selection of Sara McLafferty as our next head for several reasons. First, she will be the first woman to lead the department—a long overdue outcome. Second, Sara is well known for her accomplishments in geographic information science, thus she is ideally suited to the position following the change in name of the department and undergraduate major to include GIScience. Finally, Sara had served for many years as associate head and in that capacity demonstrated a strong commitment to the department and impressive administrative skills. She has been someone to whom I frequently turned for advice and counsel. I have no doubt that she will be a capable, successful leader of our department.

It is hard to believe that it has been more than a decade since I began as head in August 2001. Much has changed over that time, and I believe the department is in excellent shape and stands as one of the best programs in the country. We have increased our faculty from 10 members in 2002 to 15 this year. In 2007, we joined the School of Earth, Society, and Environment, which has greatly strengthened our position in the college and on campus. This past year we took the bold step of renaming our department and undergraduate major to reflect increasing emphasis on geographic information science. Last year, our PhD program was one of only nine (out of 92 PhD programs) to be ranked by the campus as excellent. Many indicators are positive and the outlook in the department is upbeat. While I valued my time as head and appreciated the opportunity to serve such excellent faculty, students, and staff, I am enjoying my return to the faculty ranks and the opportunity to once again devote my full attention to teaching, research, and service.

—Bruce Rhoads

Winter 2013
Department of Geography and Geographic Information Science
School of Earth, Society and Environment
College of Liberal Arts and Sciences
University of Illinois at Urbana-Champaign

This newsletter is produced by the College of Liberal Arts and Sciences Office of Communications and Marketing.

Correspondence may be sent to:
220 Davenport Hall
607 S. Mathews Ave.
Urbana, IL 61801
(217) 333-1880
Fax: (217) 244-1785
geograph@illinois.edu
www.geog.illinois.edu

Facebook.com/IllinoisGGIS

Twitter.com/UIUCGeogGIS

LinkedIn: Geography & GIS – University of Illinois

College of Liberal Arts & Sciences AT ILLINOIS

Roepke Scholarships Offer Student Research Opportunities with Faculty

For close to three decades now, the Howard and Ruth Roepke Scholarship has funded research opportunities for undergraduate student majoring in geography and geographic information sciences. Howard Roepke was a respected and beloved professor in the department from 1955 to 1985. As an economic geographer, Howard contributed to increased attention on the spatial dimension within economic geography through his work on the changing location of the British iron and steel industry. In honor of Howard's contribution to the discipline, the department and the Economic Geography Specialty Group of the Association of American Geographers (AAG) sponsor the Roepke Lecture in Economic Geography every year at the annual AAG conference.

Upon his untimely death in 1985, Howard and his wife bequeathed half a million dollars to the University of Illinois Foundation for the Howard and Ruth Roepke Scholarship. The scholarship awards upperclass geography majors the opportunity to work directly with faculty members in collecting and analyzing data for research projects: Recent scholarship winners include Michael Browne, a junior who conducted field research with Professor Jim Best in the lower Wabash River, taking sediment samples from along the banks of the river. Michael plans to serve with the Peace Corps as an environmental engineer upon his graduation in 2013. Rebecca Helberg is another recent scholarship recipient who worked with Professor Tom Bassett in inputting data for the recently published *The Atlas of World Hunger* (which Dr.Bassett co-wrote with Alex Winter-Nelson). Rebecca recently graduated in May 2012 and will spend the next year working for the AmeriCorps program AVODAH, an organization that integrates Judaism with social activism.

Many geography students have benefited from the scholarships set up by economic geographer Howard Roepke and his wife, Ruth.

Other past winners of the Roepke scholarship chose paths within both industry and academia: They include Michael Aducci, who worked with Professor Colin Flint in 2008 on a project that spatially and statistically analyzed presidential State of the Union addresses from 1998-2008 that confirmed an increase of the number of countries named in the speeches in every subsequent year. Since graduating in 2008, Michael works at Navteq (now owned by Nokia) in Chicago using GIS techniques to develop and test for new research methods that measure traffic. Varun Goel won a Roepke scholarship in 2010, collaborating with Associate Professor Julie Cidell on a project using GIS techniques to measure the spatial distribution of LEED-certified green buildings throughout the Chicago metropolitan region. Today, Varun is enrolled as a master's degree student in the Department of Geography and GIS, specializing in GIScience. Varun studies the effect of weather and precipitation on the spread of Bluetoungue Virus and Epizootic Hemorrhagic Disease Virus among cattle and deer in Illinois, and he hopes to pursue a career in the public health sector in his native India upon graduation.

FACULTY PROFILE

Professor Kalipeni Recounts Road to

Unlike other geographers, Professor Ezekiel "Zeke" Kalipeni chose geography "by chance," as he described it, early as an undergraduate student in his native Malawi. Kalipeni remembers being summoned by a British geography professor at the University of Malawi, due to his high entrance exam scores. "I want you to major in geography," the professor told him. But this wasn't Kalipeni's original plan. "I wanted to become a chemist so I could be an MD," he recalls. "But they said I was colorblind … I couldn't identify some of the numbers [in a colorblindness test] and therefore chemistry was not a good path [for me]." Kalipeni chuckles at this memory, since that moment led him to become a leading expert on HIV/AIDS in Africa, authoring numerous publications that leverage GIS, statistical methods, and qualitative fieldwork to study the disease.

Professor Kalipeni on the Zomba Plateau in Malawi, his homeland.

Kalipeni has spent most of the past three decades in the United States, with about 18 of those years in the Department of Geography and Geographic and Information Science at Illinois. He maintains close personal and research ties to his homeland Malawi: Kalipeni returns every summer, both to conduct field research, and reconnect with family members and relatives throughout the country. "It's not like I miss home so much, because I know I go there [every summer]," he says.

With colleagues at the University of Illinois at Chicago, some of his current research involves studying the relationship between the transmission of HIV and male circumcision in the heavily Islamic district of Mangochi in southern Malawi, which has a relatively high rate of HIV infection. Funded by a grant from the National Institutes of Health, the study hypothesizes that male circumcision provides a sort of "protective effect" from HIV like other studies have found in South Africa, Kenya, and elsewhere in Africa. However, the relatively high rate in this district, where 95 percent of the men are circumcised, required further investigation and the results challenge the current thinking that circumcision has a protective effect on HIV infection. Kalipeni and his colleagues ask why this district is not conforming to the emerging wisdom about male circumcision elsewhere in Africa. Kalipeni and his collaborators are trying to find out why, through field research focusing on the practice of male circumcision as part of rituals for boys of the Yao ethnic group in Malawi. "We are looking at all kinds of stuff," he says. "How they do their circumcision, who does the circumcision, and at what age the boys are circumcised. We are also trying to see how HIV/AIDS messages can be incorporated into the cultural material that is imparted to the boys during the initiation ceremonies."

Kalipeni hails from central Malawi and is of the Chewa ethnic group. But his family background is of mixed ethnicities, which he described as common in Malawi: His father is Ngoni, his mother is Chewa, and his wife is Lomwe. Summer visits to Malawi involve Kalipeni visiting his mother's, father's and wife's villages respectively, where they are all very happy to see him. "For me, it's home," he says. The sight of returning villagers is nothing uncommon in Malawi, as young men often leave their

Geography

Professor Kalipeni at the Blantyre Fuelwood Project.

homes to search for work far away. Around the time of Kalipeni's birth, his father migrated to Zimbabwe to work in the gold mines there, but Kalipeni was sent back to attend grade school in Malawi. Moreover, Kalipeni's district can boast of two people with doctorates, brothers Leo and Eliya Zulu, of which the former was one of Kalipeni's graduate students here at the University of Illinois.

Kalipeni is keen on maintaining active ties with his homeland, something that can be seen through a recent addition to his family: He and his wife (Fattima) recently adopted a teenage girl from Malawi, the sixth child in the Kalipeni household. His other five children, who mostly grew up in the United States, think of themselves more as Americans than he himself does, as they have grown accustomed to amenities of living in a developed country. Kalipeni noticed this when he first moved his family to the United States in the 1980s. "The kids liked it so much here [in the United States]," he says. "They liked all of the ice cream and cheeseburgers and stuff like that."

Department Faculty Promoted

In recognition of their accomplishments in research and teaching, Jesse Ribot and Julie Cidell were promoted to the rank of full professor and associate professor, respectively, during the 2012–2013 academic year.

Professor **Jesse Ribot** joined the department in late 2008 from the World Resources Institute in Washington, D.C. He currently leads the Social Dimensions of Environmental Policy (SDEP) initiative at the Beckman Institute. SDEP strives to produce research aimed at the formulation and implementation of just and sustainable environmental policy, an issue that has animated Dr. Ribot's own research on the intersection of democratic governance and sustainable environmental policy within the developing world. He has taught courses on contemporary social and environmental problems, as well as seminars on the effect of democratic decentralization reforms on local democracy and natural resource management.

Associate Professor **Julie Cidell** joined the department in 2007. Her research focuses on urban infrastructure, specifically transportation infrastructure like airports, railroads, and logistics hubs; as well as urban sustainability issues revolving around green buildings and urban sustainability policies. In so doing, she aims to bring a critical approach in understanding how changes in urban sustainability go hand in hand with changes in urban governance. Her National Science Foundation-funded research on public policy and green buildings in the U.S. has been widely published in a number of highly regarded journals, including *Journal of Transport Geography* and *Urban Geography*. Dr. Cidell teaches a wide array of courses ranging from transportation and mobility, to the urban environment, to geographic and information systems (GIS). As director of undergraduate studies, Dr. Cidell leads efforts to improve and update the department's undergraduate major.

GRADUATE STUDENT PROFILE

'Dancing Geographer' Shares South American Tales

April Colette possesses an eclectic mix of international experience that befits a budding geographer. She comes from what she calls a "big Italian Roman Catholic family" in the Philadelphia suburbs. Curiosity about her native heritage led her to participate in a student exchange program Florence and Rome, Italy, as an undergraduate at Butler University. After graduating from Butler, April studied contemporary urbanism at the London School of Economics and Political Science. Later she worked as an international development project consultant in Washington, D.C., and Tokyo. She traveled extensively in Asia and the Caribbean to carry out over 10 internationally funded projects, which largely focused on the processes and policies that affect urban spatial structure and services. But it was the desire to work in Latin America that drew her to Santa Fe, Argentina, as a study site.

Above: Graduate student April Colette researched how people in Santa Fe, Argentina, understand their vulnerability and how the government and individuals reduce or deepen vulnerability. Right: Paseo de las dos culturas, Santa Fe, Argentina (Wikimedia Commons/santafe-turistica.com.ar).

Located in the east central part of Argentina, Santa Fe is a provincial capital of around 400,000 residents—many of whom are extremely vulnerable in the face of floods. During the spring of 2003, the nearby Salado River flooded one-third of Santa Fe, dislocating over 130,000 people and damaging or destroying 28,000 homes. April's field research seeks to investigate how people understand their own vulnerability and what responses are undertaken by government and individuals to reduce or actually deepen vulnerability. In particular, April hypothesizes that the vulnerability of urban poor in Santa Fe is deepened through "clientelism," or the ways in which political support is doled out based on the promise of resource distribution by political elites to potential voters. This practice, April speculates, prevents the urban poor from making demands on the government to reduce the root causes of their vulnerability in the face of floods.

Although she conducted preliminary dissertation research in Santa Fe first in 2010 with a Tinker Fellowship, she faced many obstacles upon returning to her research site this past year with funding from the National Science Foundation and the Social Science Research Council. First, since Santa Fe is not a city known for tourism and has strict state rental laws requiring up to five guarantors, it does not have a large portion of its housing stock available for temporary leases, let alone for foreigners. This made finding a place to live difficult. Another obstacle she encountered was that it takes a long time to do qualitative research, especially ethnography. "I have had to wait, and wait and wait to set up meetings, then wait and wait at the meetings, and sometimes informants don't even show." But once she established trust, things "really took off." One particularly challenging aspect when doing ethnographic fieldwork on disasters is listening to people's stories of loss, and of course, of resilience. People lost their lives, homes, photos, personal effects that can never be replaced. It is easy to understand why people refer to the year 2003 as having a "before" and an "after." She says, if not her name, at least her face has become known around the municipal government buildings as well as in the neighborhoods where she is conducting her research. Her informants often invite her to drink "mate" and to a typical Argentine "asado" or meat barbeque in which, as a vegetarian, she has yet to indulge.

April learned Portuguese while conducting field research in Brazil for

her master's degree thesis at the London School of Economics. In awe of the thousands of street vendors she found in São Paulo, she decided to focus her thesis research on how the local state's policies to "repress" or prohibit informal workers in São Paulo actually contributed to an expansion of informal economic activity in its central district. After earning her MSc, she worked in the international development industry in Washington, D.C., for a few years, then found a job working for a development firm in Tokyo. In her second year there, her Japanese employers sent her to the Dominican Republic for a project, where she, so to speak, learned Spanish the hard way. "It was like do or die." She recalls her employers saying, "You know languages close to Spanish, you're going to go. That's how I learned [Spanish]. Not in a classroom. I learned by doing."

April has found Argentina to be an ideal place to pursue her twin passions of pilates and the tango. Pilates is more widespread in Argentina than in the U.S., April reports: "In large cities like Buenos Aires, you can find a pilates studio on every other corner. It's really trendy here." Growing up with a thirst for dance and different forms of movement, April became a pre-professional dancer of classical ballet, jazz, and modern dance. She had aspirations to continue pursuing a career in dance in New York, but her parents implored her go to college. Eventually she found a balance, making time for dance throughout her academic career. Her friends joke that wherever she goes, she finds a pilates or dance studio. Today, April has settled on one moniker for herself: the "dancing geographer."

New Faces in GGIS

Political Geographer Joins Faculty

Edward Heath Robinson joined the Department of Geography and Geographic Information Science as a lecturer this summer. He received his PhD from the University of Buffalo, where he was a National Science Foundation Integrative Graduate Education and Research Traineeship (IGERT) fellow in geographic information science. Heath is a political geographer with a specific interest in geopolitical boundaries. Recently, he has begun studying the geography of virtual worlds. Heath will be teaching an introductory GIS course, as well as several higher-level GIS and cartography courses for the department. "I became interested in geography primarily because of an excellent teacher as an undergraduate. Then, I stayed because geography has been able to accommodate all of the different things I wanted to investigate: political phenomena and geopolitics, history, philosophy, and even technology. I am a big believer in synthesis being one of geography's core components. While I am here at Urbana-Champaign, my goal is to provide students with the same kind of engaging experience that brought me to geography, and also experiment with new way of effectively delivering instructional content."

Alumnus Returns to University as Staff

Matt Cohn joined the Department of Geography and Geographic Information Science in April of 2012, way back when it was just the Department of Geography. He received a BA here in December 2003, double-majoring in psychology and creative writing. Matt had the privilege of studying with several distinguished authors in the English department, including National Book Award finalist Jean Thompson and MacArthur Fellow Richard Powers. After graduation, Matt moved to Berkeley, California, and worked as a barista and part-time bicycle messenger. He then spent a year teaching English in Seoul, South Korea, which gave him the opportunity to travel through much of Northeast and Southeast Asia. Then, Matt suddenly remembered how amazing Champaign-Urbana is, and returned here in 2009. He spends his free time cooking, playing the drums, and practicing yoga.

FACULTY RESEARCH

Team Uses Geospatial, Supercomputing Technology at NCSA to Translate 'Big Data'

By Barbara Jewett, reprinted from *ACCESS*

"Everybody is talking about big data nowadays," Shaowen Wang chuckles. "But we've been dealing with big data for years!"

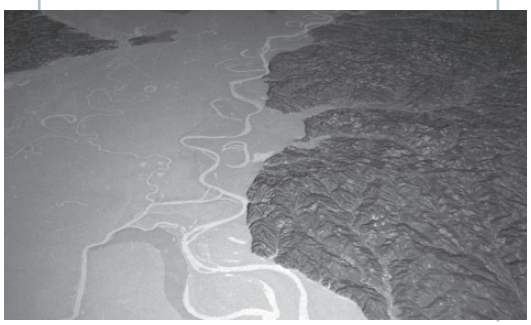
The "we" Wang is referring to is himself and his colleagues at the CyberInfrastructure and Geospatial Information (CIGI) Laboratory, especially research scientists Yan Liu and Anand Padmanabhan. Founded by Wang, CIGI is located at the University of Illinois, where the trio holds appointments in both NCSA and the Department of Geography and Geographic Information Science.

Citing the "noticeable gap" between high-performance computing computational thinking and geospatial thinking, Wang says CIGI focuses on bringing together the two different realms, merging GIS tools, methods, and applications with modern computation. That's why CIGI includes collaborators from multiple institutions that bring a wide variety of expertise to bear on the group's projects, most of which involve massive amounts of data.

"We are experiencing dramatic digital transformations of managing our global environment across many scales—understanding people's behaviors, activities, and how they are interacting with the environment—more than ever before," says Wang. "This is happening across science and engineering. In the geospatial world we see a huge acceleration happening, especially in such things as Google Maps and Google Earth, which just came out around seven years ago. This is now a huge industry together with vibrant science and engineering research. With GIS, we're talking about digital assets, and digital representations of our life experiences, and how to understand those experiences mirroring the real world."

The CIGI Dimensions

The CIGI team hopes their research will soon empower a significant mass of users to have access to more advanced, customized, and individualized geospatial intelligence services. Their mission is a little like Lewis and Clark, Wang says. The famed explorers "Corps of Discovery" mission 200 years ago focused on the scientific and the commercial; CIGI seeks to aid science discoveries while also contributing societal benefits.



This "Great Flood" image shows how the CIGI team and visualization artists from NCSA's Advanced Visualization Lab recreated the Mississippi River flood of 1927 using data from a variety of sources. The lighter ribbon-like area running through the center of the image is the Mississippi's current channel.

Supercomputing technologies give the team some advantages to do detailed large and multi-scale analysis and modeling that otherwise would not be possible, and also aid them in creating a benefit for the masses. Thus they like to think of their team's work as having both deep and wide dimensions.

Nowadays geospatial data and technologies broadly, and GIS in particular, are widely accessible. People can do simple analysis on their smartphones, says Wang, like find the nearest restaurant.

"This broad dimension to GIS is touching upon a lot of people's lives on the planet," he says. "There are some games like where things are, those kinds of fun things, that help people actually appreciate more and more what this digital world is about."

CyberGIS

With a $4.4 million grant from the National Science Foundation (NSF), the CIGI team and their collaborators are working to develop CyberGIS, a comprehensive software framework that harnesses the power of HPC and cyberenvironments and integrates it with data management and visualization for GIS and associated applications.

CyberGIS is focused on scientific problem solving and user-friendliness and allows anyone interested in GIS—scientist, student, or Grandpa Joe—to access GIS tools. A true merger of "deep and wide." Through the GISolve Middleware project, the team develops the middleware necessary for seamlessly gluing software. The GISolve middleware is getting a good test through the CyberGIS project.

The team is putting together a CyberGIS Gateway prototype. A number of users can simultaneously submit data-intensive computing tasks that run seamlessly on supercomputers, without being exposed to the supercomputing's complexity.

One problem that they've run into is that all the analysis and modeling is conducted using NSF XSEDE resources. Users' jobs are submitted and must wait in the queue. Academic researchers are used to queue waits, but for a problem that needs information back quickly, it could be problematic.

And the wait time may cause a casual user interested in learning more about GIS to become frustrated and lose interest, and most likely not return to the site.

Social Media & Public Health

Social media even gets into the geospatial digital mix. CIGI is using Twitter data to understand the possibility of early detec-

tion of flu outbreaks. They use keywords from tweets to get real-time data and see spatiotemporal distributions of possible flu cases and how spreading is occurring, using multiple spatial analytical methods.

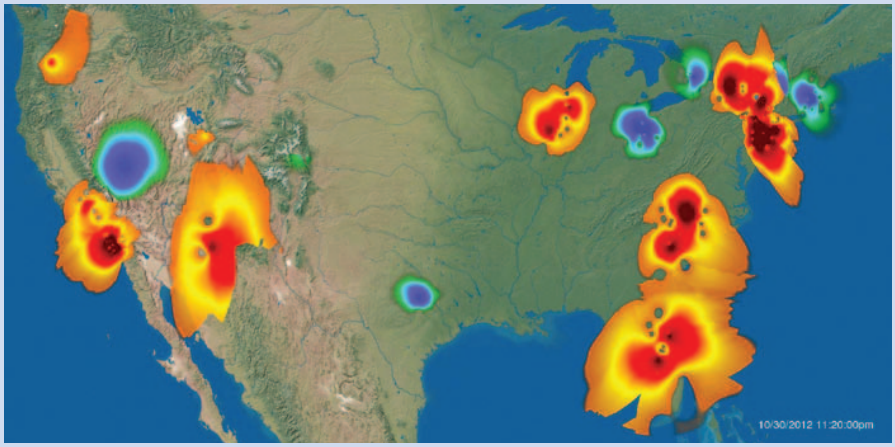
When Padmanabhan talks about "who" has flu it is in a very broad, impersonal sense, he notes. "Twitter may be collecting data, but in what we get we may not identify a particular person," he reassures.

Currently there are two projects in the Twitter flu domain. Graduate student Yanli Zhao uses NCSA's Forge in order to analyze spatial patterns over days, weeks, and months. She looks at where tweets reporting flu originate, hoping to identify flu hotspots. Preliminary results of spatial patterns of flu risk in the United States generated on a daily basis indicates the potential of the approach to serve as an early warning and detection of flu risk. More work is underway to validate the results with other flu reports. The other project looks at the transportation patterns of these people since in our mobile society disease may spread more rapidly.

"Today you tweeted you have flu. Are you on the move? Where are you going with this flu symptom and how are you spreading it?" Padmanabhan says, noting that where possible they try to identify from tweets the mode of transportation, as well as the geographic location.

The projects are further examples of the "deep and wide" dimensions of CIGI's vision. Graduate student Eric Shook uses supercomputers to model large-scale geospatial dynamics at individual level using flu spread as a case study, which parses with the deeper aspect of data modeling. Padmanabhan says one key aspect still in development is how to link the social media data with other local, regional, and global information.

One day soon public health officials may be able to employ social media-based GIS and spatial analysis tools in their work. In the meantime, a paper the team wrote about their work with social media data will be published in an upcoming book.



Viewing the hopes and fears of the world during Hurricane Sandy through the analysis of real-time Twitter data on the SGI UV 2000. Red represents more negative sentiment; blue represents more positive sentiment.

Big Brain Computer Powers the Global Twitter Heartbeat

SGI, the leader in technical computing, has partnered with Kalev H. Leetaru of the University of Illinois and Dr. Shaowen Wang of the CyberInfrastructure and Geospatial Information (CIGI) Laboratory at the University of Illinois to create the Global Twitter Heartbeat, a first ever real-time combined population, tone, and geographic analysis and visualization of Tweets on an SGI UV 2000 Big Brain computer. The ability to analyze Big Data in real-time, in sophisticated ways, allows organizations to gain immediate and actionable insights. With this capability, researchers, scientists, and engineers who are facing increasingly data-intensive problems can move rapidly from data to insight.

The Global Twitter Heartbeat project performs real-time stream processing of 10 percent of Twitter's 500 million daily tweets as they are posted. The project analyzes every tweet to assign location (not just GPS-tagged tweets, but processing the text of the tweet itself), and tone values and then visualizes the conversation in a heat map infographic that puts tweet location, tweet density, and tone into a unified geospatial perspective. With SGI UV, the entire process from ingest to data analysis to heat map runs at a speed that allows visualization of a map frame per second.

The project looked at two significant recent events—Hurricane Sandy and the U.S. Presidential Election. In both events, millions of tweets were sent, making Twitter a significant platform for communicating what was happening at every moment.

As seen through time-lapsed animations of the heat maps, viewers are able to re-live the events as they happened on Twitter. The project observed a massive increase in Twitter traffic as Hurricane Sandy approached, made landfall, and took its course over the U.S. eastern seaboard. For the U.S. Presidential Election, the heat maps showed the dynamics of intensity and location of tweets favorable to either President Barack Obama or Governor Mitt Romney over the course of Election Day, from the first polls opening to after President Obama's victory speech.

"This real-time data analysis approach is like having a new telescope in our hands. We are just seeing the Twittersphere in this way for the first time and we're still not entirely sure how to make sense of it all and what it tells us, but it is allowing us for the first time to peer in the messy chaotic world that is the heartbeat of our society," said Leetaru. "SGI UV allows users to turn the traditional approach of decision-making on its head with the ability to gain insights as they happen, to what I would call a 'post-demographic' world in which we can see people's hopes and fears in real-time person-by-person, rather than just putting them into fixed demographic labels."

New Graduate Students Bring Diverse Interests

Matt Aadland is from Brookings, S.D., and holds a bachelor's degree from South Dakota State University with majors in geography, political science, and geographic information systems. He intends to study gentrification at the University of Illinois using rural areas as empirical foci. He has a separate interest in studying ambient geospatial information extracted from social media networks.

Yizhao Gao was born and grew up in China. His interest in geography grew from a childhood fascination with reading and drawing maps. He received his BS degree in GIS at Peking University, where he studied problems of place and distance on the web. His research interest is in spatial analysis and its applications. Yizhao is also interested in CyberGIS, and is eager to explore new topics which combine GIS and the web.

Hao Hu was drawn to U of I's strong engineering program. His favorite topic is quantitative methods in geographic studies, and he also plans to study programming and algorithms in GIS, spatial statistics and geovisualization. As a research assistant, Hao expects to join the CyberInfrastructure and Geospatial Information (CIGI) Laboratory lead by Dr. Shaowen Wang. Hao's goal while studying at U of I is to learn and explore advanced computer science techniques which can be potentially applied to GIScience research. He plans to be both a GIS engineer and a geographic researcher during his PhD studies.

Crista Johnson studied primate behavioral ecology and conservation at the University of Washington as an undergraduate. After conducting fieldwork in Indonesia and Kenya, she sought to better understand human societies that surround richly bio-diverse areas of primate habitation. In 2012 she graduated from American University with an MA in international peace and conflict resolution, with which she had a specific focus on wildlife conservation and peacebuilding in Central Africa. For the past year she has managed a baboon behavioral ecology project in Cape Town, South Africa. As a doctoral student, she will explore how social issues, particularly ethnicity and race, support or hinder the implementation of wildlife management programs in South Africa.

Joseph Miller received his BA in biology from DePauw University and MA in geography from the University of Illinois at Urbana-Champaign. His interests revolve around conservation and development questions pertaining to East Africa. During his PhD program, Joseph aims to continue his research on the social implications of wildlife conservation in Tanzania while exploring other areas of inquiry related to the effects of globalization and urbanization on rural Tanzanian livelihoods and landscapes.

Alex Peimer, born and raised in the foothills of the Catskill Mountains of New York State, has always been taken by the ways that people interact with and manipulate their surrounding landscape. Alex earned an AS in natural science from SUNY Cobleskill in 2008, a BA in geography with a minor in geology from SUNY New Paltz in 2010, and a MA in geography from Kent State University in 2012. GGIS at U of I suits Alex because he expects his research to focus on the intersection of the cultural, political, and physical dynamics of surface water systems and processes related to agricultural land use.

Vijay Ramprasad's research interests focus on climate change mitigation and adaptation, sustainability of social and ecological systems, and science-driven policy—topics well represented at SDEP, CIGI and Illinois geography. He is particularly interested in understanding the ways in which knowledge interacts with natural resource governance and how new scientific information is made useful. Vijay has a MS in environmental policy from the University of Michigan and has previously conducted research at the Center for Ecological Sciences, Indian Institute of Science.

Class Notes

Stian Rice received his MA in geography from Kent State University and a BA in linguistics and philosophy from the University of Rochester. Initially drawn to cartography and GIS, his interests in geography rapidly expanded to include political ecology and critical environmental history. His current interests lie at the intersection of modern geopolitics and food security. In particular, his doctoral work will focus on the social and environmental consequences of agricultural change under modern discourses of development, capitalism, and democratization.

Tushar Verma has an undergraduate degree in mechanical engineering from IIT Bombay. Born and brought up in India, he has always been interested in nature. The application of theoretical principles to a natural system presents unending challenges. A graduate program in river, watershed and landscape dynamics at U of I will give him the opportunity to utilize his training in Mechanical Engineering while working on a natural system.

Alan David Gray, MA 1978, studied with Janis Monk, Geoffrey Hewings, and Howard Roepke. Alan is now retired, after serving as executive director for the Mid-South Transportation Organization (a nonprofit). Prior to that, he served as manager of Economic Development for the City and County here, director of governmental affairs for the Memphis Area Chamber of Commerce, and in a variety of planning jobs at City Hall. Alan lives with his wife Karen in Memphis, Tennessee. They have two daughters, April and Rachel, and six grandchildren.

Elizabeth Lyon, MS 2006, currently serves as the assistant director for Geospatial and Social Modeling Technologies, in the U.S. Army Corps of Engineers' office of the assistant secretary of defense for Research and Engineering Research Directorate. Elizabeth is working towards her PhD in computational social science at George Mason University, and is actively working with the AAG on careers for geographers.

Dr. William G. Hanne, MS 1968, has been Borough Mayor of Arendtsville, Penn., since 2000; William has been widely involved in economic development, chambers of commerce, and planning both in the states and abroad. In 1991, he received a second PhD in policy, planning, and development from the University of Maryland.

Jay Harman, PhD 1968, designed the course "Environmental Ethics," which he has taught at Michigan State University since the early 1990s.

Jordan Decker, BA 2004, earned a MS in GIScience at San Diego State University in 2006, and is currently the GIS manager at Geosyntec Consultants in Chicago.

Joseph Schiel, Jr., PhD 1971, is now retired, after a career of teaching various geography courses, and serving as the head of an agricultural product testing laboratory, as well as a production and drilling supervisor for a small oil company.

Marc Decker, BA 1973, retired, was chief operating officer of GeoAnalytics Inc in Chicago.

Steve Breese, BA 2001, has been an operations engineer at Nokia (previously Navteq) since 2009. While at the University of Illinois, he served as the department's unicyclist.

Steve Thayer, BS 1989, serves as Walgreens' director of market and facilities development. He began working there in 1989 as a location research analyst, and oversaw the company's transition into a GIS-based analytical model.

Timothy Thomure, BA 1991, earned a master of engineering degree from the University of Arizona in 2009, and is currently the Arizona Water Business Group manager for HDR Engineering, Inc.

Let Us Know What You Are Doing

To be included in Class Notes, send an email with your personal or professional news to geograph@illinois.edu. Please include your degree information with your update.

Department of Geography and Geographic Information Science
University of Illinois at Urbana-Champaign
220 Davenport Hall
607 S. Mathews Ave.
Urbana, IL 61801

Nonprofit Org.
U.S. Postage
PAID
Permit #75
Champaign, IL

ILLINOIS
UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

WE VALUE YOUR SUPPORT!

Show your support for the Department of Geography and Geographic Information Science at the University of Illinois by contributing to the department's Annual Fund.
Go to: www.las.illinois.edu/giving

A Flash from the Past

This vintage Illinois postcard shows the original Agriculture Building, which opened in 1899. It was renamed Davenport Hall in 1947, after the former dean of the Agriculture College, who later became vice president of the University of Illinois. (Courtesy of Professor Bruce Hannon.)