View from the Chair, Chris Justice

2016 proved to be a very productive year for the Department. This was evident from graduation. We usually have a small number of graduates in the Winter but this year we graduated 6 PhDs, 8 MPS students and 25 Undergraduates continuing the record-breaking Spring graduation. External research funding, which supports our research faculty and graduate research assistants, we continue to excel. For FY16, in terms of the amount of external funding, we were the highest academic department in our College and 4th on Campus behind Astronomy, Physics and Mechanical Engineering. Despite positive efforts in recent years to diversify the source of our externally funded research, we are still heavily dependent on NASA funding. Since the election, there is some uncertainty concerning future NASA-funding for Earth Science which is hanging over us but we are hoping that common sense prevails and that using national satellite remote sensing to study how we are changing our own planet and the resulting impact remain major components of the NASA program. New faculty members Assistant Professor Grant McKenzie and Full Professor Leila DeFloriani joined our Center for Geospatial Information Science (CGIS) this semester and are now helping to build a strong foundation for the Center in the research areas of time-place analysis, geospatial data visualization and spatial data structures. Leila was elected to the prestigious IEEE Computer Society Board of Governors and will take up this position in January. We are hoping for an equally productive year in 2017 and wish all our alumni a Happy New Year.
Drs. Kathleen Stewart (the CGIS Director) and Tatiana Loboda continue to expand our research partnership with University of Maryland Baltimore on geospatial aspects of human health. Assistant Professor Christina Prell transferred her tenure home from Sociology Geographical Sciences and brings expertise in social networks to our Human Geography program. We were all very pleased to see Liz Smith return to the front office after a long period of hospitalization and convalescence. Mark Lennon joined us as a Research Coordinator from UNC Charlotte and hit the ground running, helping manage the high volume of research grants that we process. We have also been fortunate to have Mary Mitkish join our front office staff, bringing her enthusiasm and efficiency to bear on our campus bureaucracy and to help the Chair keep on schedule. I would also like to thank Dr. Kusuma Prabhakara for taking on the production of this edition of the newsletter.

The second half of 2016 provided a remarkable end to a remarkable year! As of October, the Earth was on pace to have the warmest year on record globally since modern record keeping began in 1880, with 15 of the 16 previous warmest years, all since 2001. Global atmospheric CO2 concentrations continued to rise, and crossed the 400ppm threshold. New analyses of 2015 revealed that the dramatic increase that year was primarily due to declining carbon sinks, as opposed to increased human emissions, signaling potentially dangerous feedbacks from the Earth system due to heat and drought. Internationally, efforts accelerated to address climate change, biodiversity loss, and other sustainable development goals, while major political changes in the U.S. and abroad brought major new uncertainties for future carbon emissions, environmental policy, and relevant research. In this dynamic context, the department of GEOG has stayed extremely active, productive, and out in front. In the second half of the year alone, new research grants were selected across a diverse range of topics and scales including: the role of land cover / land use in malaria transmission in Myanmar (Loboda, Stewart, Silva), resilience options for climate vulnerable Africa (Brown), a cropland carbon monitoring system for U.S. (Izzaraulde, Bandaru), and consistent long term land climate data records from satellites (Roger, Franch, Vermote).

New papers described the effects of future urban expansion on fertile cropland (Baiocchi), the accuracy of long term forest cover change data records (Feng, Sexton, Townshend), and future scenarios for global climate change and related international efforts to study the effects of land-use change on climate (Hurtt). PhD students lead papers on stand-age dynamics in Siberian Larch forests (Cheng, Loboda, Krylov, Potapov), mapping cropland burned area in Russia (Hall, Loboda, Giglio), and potential future vegetation and carbon redistribution in North America in response to climate change (Flanagan). In outreach, Nature published an article featuring one of our own (Hansen) leading the near real time monitoring of global deforestation. Much of this work was presented at the American Geophysical Union (AGU) Fall meeting, in over 34 first author presentations, and convening roles in 9 sessions. Notably, 8 of our faculty were recognized at the 18th Annual University-Wide Research Leaders Luncheon (Hansen, Huang, Hurtt, Izzarulde, Justice, Kasischke, Loboda, Potapov).
PhD Student awards included AAG Human Dimensions of Global Change Speciality Group Research Grant (Anderson), Meade Distinguished Scholarship Award (Cao), and Ford Foundation Predoctoral Fellowship (Rappaport). PhD student Yuhan Rao was awarded 2017 NCAR Graduate Visitor Fellowship. Our world-class research faculty continues to thrive and now totals 94 members across all ranks! I’d like to welcome 6 new additions to the Research Faculty; Riccardo Fellegara, Steve Flanagan, Federico Luricich, Stuart Sheppard, Walter Andres Hernandez Serna, and Alex Zudkin and we offer our best wishes for continued success to departing members Katie McGaughey, and Maosheng Zhao.

**New beginnings: The Center for Geospatial Information Science**

By Kathleen Stewart

Over the past year, with support from Geographical Sciences, the College of Behavioral and Social Sciences (bsos.umd.edu) and the Office of the Provost (provost.umd.edu), faculty and researchers from Geographical Sciences have been busy establishing a new Center for Geospatial Information Science (CGIS) (geospatial.umd.edu). This center is focused on research and education in the exciting field of geospatial information science, as well as training a geospatial workforce. In Fall 2016, newly appointed Professors Leila De Floriani (professor, visualization and data representation) and Grant McKenzie (assistant professor, data-driven approaches for space and place) joined with CGIS director Kathleen Stewart (associate professor, temporal GIS and mobility science) to begin the work of the CGIS. New space for the Center was renovated during summer 2016 and at the beginning of the fall, a group of postdoctoral researchers, graduate students and visiting scholars moved into the Center’s facilities. CGIS facilities include a dedicated lab and demonstration space for geocomputation and visualization, a situation room for meetings and seminars, and a maker space for short courses and hands-on training. A search is underway this fall/winter to add one more tenure-track faculty member to the CGIS in a related geospatial field in 2017.

**What the CGIS does…**

The Center’s work focuses on the development and use of the latest geospatial science and technologies to address the unique challenges associated with the analysis and modeling of location-based phenomena. As the demand and interest in geospatial technologies grows at a rapid pace, the range of applications for which an understanding of geospatial science is necessary is also expanding, for example, applications involving the movements and relationships of vehicles, population groups, storm fronts or infectious diseases, applications that reveal geographic patterns or trends that would be otherwise unknown, or applications on mobile devices that deliver a range of location-based services to help people in their daily lives.

Kathleen Stewart’s research group studies the travel behaviors of drivers (color changes match shifts in speed) as they undertake regular, daily driving activities.
To carry out this research, CGIS researchers have the support of two state-of-art high-performance computing clusters as well as an array of high-end workstations and a visualization wall for demonstrations.

Leila De Floriana’s research group creates and analyzes time-varying visualizations, for example, this simulation of Hurricane Isabel.

Grant McKenzie’s research includes designing methods for exploiting and visualizing spatial, temporal and thematic signatures useful for applications of geoprivacy, such as these temporal signatures capturing when individuals share information about visiting e.g., theme parks (a,b,c) and drug stores (d,e,f).

Education

The CGIS is launching its own Masters and Graduate Certificate of Professional Studies in Geospatial Intelligence in Fall 2017. Dr. Ruibo Han is a CGIS lecturer and key contributor to this planned new graduate program. We anticipate that this Master’s degree program will offer students an opportunity to learn geospatial skills that are especially useful for the applied problems, analysis frameworks, big geospatial datasets, and software platforms that characterize today’s geospatial intelligence. The CGIS also offers short courses and workshops on an array of GIS topics (e.g., Python programming for GIS, Hadoop and big geospatial data) on a regular basis.

Collaboration

The CGIS is working across campus to contribute its expertise with geospatial theory and techniques in a variety of supported projects. This includes collaborations with the National Transportation Center, The Center for Substance Abuse Research, The National Consortium for the Study of Terrorism and Responses to Terrorism (START), the iSchool, UMIACS, and the School of Public Health at UMD College Park, as well as the Institute for Global Health at the University of Maryland Baltimore School of Medicine, and the University of Maryland Marlene and Stewart Greenebaum Comprehensive Cancer Center among others. The CGIS is also excited to grow its number of affiliate members that are drawn from a range of disciplines from across the UMD community.

Interested in finding out more about the CGIS or working with CGIS researchers? Contact Director Kathleen Stewart by email at stewartk@umd.edu or call 301-405-3203.
Wheat area estimates for Punjab Pakistan, an intensive small farm agriculture case study

By Ahmad Khan and Matt Hansen

Punjab Province is the bread basket for Pakistan and the key producer of wheat, the major staple food in Pakistan. Any shortfalls in production of wheat in Punjab and elsewhere puts the food security of the 188 million people of Pakistan at stake. It is therefore imperative to know estimated production of wheat in time and with reliable accuracy to benefit the people through proper market initiatives. The pre-harvest estimation of wheat area and its production forecasts are crucial for taking key policy decisions on marketing, transportation, storage, export and imports. In developing countries like Pakistan, the estimation methods rely on conventional list frames, a sampling that is not only labor intensive but also need substantial time to compile results, which are usually available two to three months after the wheat harvest. This risks food security of the growing population of Pakistan, as decisions cannot be based on results of the crop forecasting efforts.

As an alternative, remote sensing based crop estimates using MODIS and Landsat data have been successfully employed. Most of the efforts relied on modeling variables with NDVI derived from MODIS and Landsat data. Our research focuses on using Landsat images from a growing season, classifying those to derive a wall-to-wall wheat map and estimate area from that. The data are freely available and can be downloaded from archives of NASA and also the University of Maryland. With capabilities improved in remote sensing data acquisition, geographic coverage, higher temporal and spatial resolution and its processing has developed significantly and offer the opportunity to address the challenges of timely and reliable reporting of crop estimates.

At the Department of Geographical Sciences, University of Maryland’s GLAD team led by Professor Matt Hansen, Ahmad Khan a Faculty Research Assistant is leading an effort with the team to develop Landsat based techniques to estimate pre-harvest area of wheat for Punjab Pakistan. The research has demonstrated a successful wall-to-wall classification of medium resolution 30 meter Landsat data. Wheat phenology in Punjab covers sowing in October and November to harvesting in April and May. With a 16-day repeat cycle, Landsat provides sufficient temporal and spatial coverage to generate metrics and composites for the growing season.
Wheat area estimates for Punjab Pakistan, an intensive small farm agriculture case study, continued...

In our work, we used various composites generated from the Landsat metrics and trained them for running a supervised bagged tree classification. The classification result is validated with field based stratified random samples. The research has resulted in publishing a paper in the Journal of Remote Sensing in 2016. The research continues with a plan to use high resolution 5 meter RapidEye imagery for Punjab with Landsat data for a higher accuracy and precision. We expect that the method will be better, quicker and more reliable as compared to only Landsat-based classification.

Food Security Report Recognized by 2016 USDA Lincoln Award

By Molly Brown

Dr. Molly E Brown, Associate Research Professor of the Department of Geographical Sciences, was recognized with a top USDA award for a global food security report. The USDA ‘Climate Change, Global Food Security, and the U.S. Food System’ report received the 2016 Lincoln Award for increasing Global Food Security. The Abraham Lincoln Honor Awards are the most prestigious departmental awards presented by the Secretary of Agriculture. The group received the award at a ceremony held September 13 in Washington DC.

Margaret Walsh of the Office of the Chief Economist and Dr. Brown were the group leaders of the project, which was written by 32 experts from 19 federal, academic, nongovernmental and private organizations in four countries. The scientific assessment identified climate change impacts on food availability, access, utilization and stability, and found that climate risks to food security likely to increase as the rate and magnitude of climate change increases. The report determined that food producers and consumers in the United States were also likely to be affected by climate change because of the highly integrated nature of the global food system.

The price and variety of food available for US citizens was likely to change, as well as demands placed on food exports as changes in processing, packaging, transportation and storage occur in the coming decades. The report was one of the first to describe how the US food system was likely to be affected by changes in the global food system due to climate.

The report was released in December 2015 and can be found at http://www.usda.gov/oce/climate_change/ FoodSecurity.htm?v=ROBBUSB75
By Wilfrid Schroeder

For nearly three decades satellite active fire detection data users have relied on coarse (> 1 km) resolution data to monitor wildfire activity in the U.S. and abroad. While resolving fractional flaming fire fronts as small as 0.01% of the pixel’s footprint (roughly 100m²), omission errors of smaller/low intensity fire components and the intrinsic pixilation of those fire products limited their application in tactical fire management and landscape analyses. That changed recently with the development of two new fire detection products derived from the NOAA-NASA/S-NPP Visible Infrared Imaging Radiometer Suite (VIIRS) 375 m and the USGS/Landsat-8 Operational Land Imager (OLI) 30 m data. Associate Research Professor Wilfrid Schroeder led the development of the algorithms, and their transition to operational use at the USDA Forest Service Remote Sensing Applications Center in Salt Lake City, UT. The summer of 2016 marked the first fire season in the Western U.S. during which moderate resolution Landsat-class active fire data were used to help with routine wildfire mapping in the region. The figures on the left illustrate the Blue Cut Fire in California as it was imaged by OLI on the night of 16 August 2016, followed by a USDA National Infrared Operations (NIROPs) airborne overflight approximately 30 min later, and by a second OLI daytime acquisition on the morning of 18 August. Thanks to its smaller pixel footprint, nighttime OLI fire data can resolve flaming fires as small as 0.5m² (area equivalent to a recreational fire pit) providing fire managers with a detailed map of the fire perimeter as seen in the example above. Building on these data sets, Dr. Schroeder is pursuing new applications including data assimilation into sophisticated coupled weather-fire models in collaboration with Dr. Janice Coen, a fire scientist with the National Center for Atmospheric Research (NCAR) in Boulder, CO. The new data sets and methodologies developed have allowed the successful forecasting of wildfire propagation and the simulation of erratic fire behavior that can often endanger the lives of crews working along fire suppression lines.
Exploring Historical Trends in Climatic Hazards and Disaster Response

Doctoral candidate Kelly Anderson of the University of Maryland, College Park, departed the United States for the southern African nation of Mozambique to begin the first phase of her dissertation research in the capital city of Maputo. Through funding provided by the Human Dimensions of Global Change specialty group of the AAG and the David L. Boren Fellowship Program, Kelly has engaged in intensive Portuguese language study in tandem with archival research conducted at the Arquivo Histórico de Moçambique. Currently she is analyzing historical trends in climatic hazards, as well as individual, community, and government responses to hazard related disasters.

Kelly concludes archival research in November of this year, after which she will travel to her case study site of Beira in the central region of coastal Mozambique. Once situated, Kelly will evaluate vulnerability among recent migrants and established residents of some of the most marginalized neighborhoods in Beira, taking into consideration the historical and contextual factors that potentially influence household livelihood strategies, as well as impediments or facilitators to overall well-being, resiliency, and adaptability in a region of the world characterized by rapidly changing environments.

Photo (below): A view of the headquarters of the historical archives of Mozambique in the capital city of Maputo.

Photo (above): Visit to a community elder’s home in the Munhava-Matope bairro of Beira City where Kelly will be conducting case study research early next year.
Fieldwork and collaboration with Vietnam National University: Hanoi to characterize small-holder rice straw burning

By Kristofer Lasko

Crop residue burning in agricultural areas of the world adversely impacts public health, air quality, and greenhouse gas emissions. The burning of crop residues, which are defined as inedible plant material left in the field after harvest, contributes to at least one-third of global biomass burning emissions. While research has been conducted on emissions from rice straw burning, little is known about total residues burned, local emissions factors, and the emissions variation due to residue management and crop residue burning practices as measured in the field. Hanoi, Vietnam was selected as a case study as it experiences high levels of air pollution on a regular basis due to both urban and agricultural emissions. Hanoi was the subject of a field campaign conducted by members of the Department of Geographical Sciences in collaboration with Vietnam National University in Hanoi.

During September and October 2016, GEOG PhD candidate Kristofer Lasko, travelled to Hanoi, Vietnam to conduct field research guided by his advisor and department chair Dr. Chris Justice, and adjunct professor Dr. Krishna Vadrevu. The field campaign focused on quantifying rice straw burning, residue management practices, and the characteristics of the rice straw prior to burning. The data collected included geotagged ground-truth photos, fuel-loading, patterns of rice straw burning and characteristics of the straw; all of which have an impact on the emissions from rice straw burning.

Photo (above): Picture of harvested paddy field in Hanoi province, Vietnam

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Fieldwork and collaboration with Vietnam National University: Hanoi to characterize small-holder rice straw burning, continued...

The field campaign will result in the development of local fuel-loading factors for Hanoi province, Vietnam which will be the basis for rice straw production estimation, as well as emissions and air quality impact from rice straw burning in this unique, heterogeneous landscape mixed with urban population clusters adjacent to small-holder cropland areas burning rice straw.

During the field campaign we collaborated with the Field Information Monitoring Center (FIMO) at Vietnam National University, with whom our department has collaborated with on previous projects since 2011. They provided local knowledge and guidance in the field for data collection including Dr. Nguyen Thi Nhat Thanh (FIMO Asst. director), Tran Tuan Vinh (PhD student), and Dr. Bui Quang Hung (FIMO director). Through future collaboration and research, our department plans to continue fostering and developing international collaborations with Vietnam and other Southeast Asian countries as part of broader regional networks such as South/Southeast Asia Regional Initiative, SERVIR-Mekong, GOFC-GOLD.

Assessing the Carbon and Biodiversity Consequences of Amazon Forest Degradation

By Danielle Rappaport

I set off towards my PhD research site on the frenzied Brazilian highway, BR-163, hemmed in for more than 6 hours by a line of freight trucks that extended far beyond the horizon. It was late June, peak harvest season, and I was on what is commonly known as the “Soy Highway,” a stretch of more than 1,500 kilometers that connect Mato Grosso’s agricultural heartlands to the ports along the Amazon River for eventual export to China and elsewhere. Between June and October, under the auspices of NASA and NSF fellowships, I carried out two field campaigns in this active agricultural frontier where I collected bioacoustic and floristic data to assess the consequences of Amazon forest degradation.

Mato Grosso has been a “poster child” for Brazil’s export-oriented agricultural boom since the early 2000s, when its beef and soy production accounted for more than 15% of tropical deforestation worldwide. It then fell out of rank as a top deforestation hotspot by the end of the decade, owing to a number of enforcement, policy and macroeconomic measures that curbed deforestation, while increasing agricultural output to record highs. Since then, Mato Grosso has emerged as hotspot of a more literal kind. It is home to the highest rates of repeated fire activity across the entire Amazonian arc of deforestation. Unlike the fire-adapted Brazilian savanna (the Cerrado), the Amazon basin has evolved in near isolation from fire, leaving most tree species ill equipped to survive human-ignited fires. Fire vulnerability is further compounded by logging, fragmentation, and drought, which, together, serve to lock remnant forests into feedback cycles of degradation. What these routine degradation events mean for the fate of the southern Amazon is largely unknown.
Assessing the Carbon and Biodiversity Consequences of Amazon Forest Degradation, continued...

With operational satellite missions such as Landsat and MODIS, the remote sensing community has made great strides in tracking the spread and frequency of forest degradation from fire and logging. Much less is known about the long-term effects of these disturbances; particularly the insidious impacts to carbon stocks and biodiversity that are not readily apparent from space. Amazon frontier landscapes are expansive mosaics with dramatically heterogeneous structural and floristic properties, representing distinct legacies of landuse and degradation. Successfully characterizing change means being able to measure fine-scale variability at broad-scale extents. This poses an enormous monitoring challenge, as conventional field techniques seldom translate to landscape scales. Lidar and acoustic remote sensing are two emerging remote sensing technologies that can help extend field data and augment satellite data, and my PhD aims to evaluate their potential synergies within the context of biomass and biodiversity.

By utilizing lidar and field data, I aim to directly target data needs for REDD+ by exploring the carbon consequences of degraded forests over a range of conditions and scales. Further, I am using automated bioacoustic recording devices together with species-specific machine-learning based classification to characterize the acoustic community across diurnal time scales and broad geographic extents. Finally, to link habitat, biodiversity, and carbon, I will be using a Bayesian hierarchical occupancy modeling framework.

I conducted my two field campaigns in northern Mato Grosso, the municipality of Feliz Natal, due to the predominance of fire and logging and an existing network of airborne lidar and floristic inventory plots installed under the USAID-funded Sustainable Landscapes Brazil, a project coordinated by the US Forest Service, the Brazilian Corporation for Agricultural Research (EMBRAPA), and NASA. The primary objective of my field campaigns was to deploy and retrieve autonomous bioacoustic recorders in forests with contemporary lidar coverage across a range of degradation histories.

Two months later, I returned to the region for data collection in September and October, peak bird breeding season. Together with a local student and forest technician, I spent 40 days blazing trails, deploying recording devices, and measuring habitat covariates. We successfully penetrated over 15 km of some of Brazil’s most degraded (read: impenetrable) tropical forests, and retrieved nearly 40 5-day recording samples across a range of forest conditions. These datasets will support my inquiries over the next few years into how forest degradation alters carbon stocks, habitat structure, and biodiversity communities across Amazon frontier landscapes.
GEOG Commencement, December 2016
Agriculture Monitoring in Ukraine within the GEOGLAM Initiative

By Sergii Skakun

Ukraine is one of the most developed agricultural countries in the world. According to the U.S. Department of Agriculture (USDA) Foreign Agricultural Service (FAS) statistics, Ukraine was the largest sunflower producer (11.9MT) and exporter, and the eighth largest wheat producer (27.3MT) in the world in 2015. Agriculture monitoring in Ukraine represents a major task at national and international levels. The Department of Geographical Sciences of the University of Maryland, College Park, is playing a major role in international coordination through the GEO Global Agriculture Monitoring (GEOGLAM) initiative.

In this context, the Department has established collaborative partnerships with the Space Research Institute NAS Ukraine & SSA Ukraine, and Ukrainian Hydrometeorological Center, two leading organizations in remote sensing and agrometeorology domains. This collaboration was further strengthened during the GEOGLAM and Sentinel-2 for Agriculture Workshop held October, 10-14, 2016, in Kyiv, Ukraine, where Prof. Justice, Dr. Becker-Reshef, and Dr. Skakun participated (Fig. 1). The visit also included a meeting with the Deputy Minister of Agrarian Policy and Food of Ukraine, where further steps for developing an EO informed, operational agricultural monitoring system in Ukraine were discussed. The outputs of the system will be used within the Market Monitor of the Agriculture Market Information System (AMIS).

Photo (above): Example of winter crop map for Ukraine produced with MODIS derived NDVI and MERRA2 derived GDD for 2016.
Agriculture Monitoring in Ukraine within the GEOGLAM Initiative, continued...

These will be supported by ongoing research activities carried out in the Department in the agriculture domain. The empirical EO-based model developed by Becker-Reshef et al. (2010) and Franch et al. (2015) is routinely used to provide forecasts of winter wheat yield 1.5-2 months before harvest at national scale in Ukraine. To feed the model with a winter wheat mask, an automated approach for early season winter crop mapping using MODIS derived NDVI time-series and growing degree days (GDD) information derived from the Modern-Era Retrospective analysis for Research and Applications (MERRA-2) product is being developed (Fig. 2). Incorporation of accumulated GDD is critical in order to account for discrepancies in crop phenological development and, thus, to provide a generalized classification model applicable among multiple seasons. The method can map winter crops 1.5-2 months before harvest with accuracies >90%. To derive winter wheat production, early season estimation of winter crop area for Ukraine using Landsat-8 imagery is performed. First, we analyze winter crop maps derived from MODIS to estimate the optimal number of samples and stratification scheme and number of strata. Then, for fixed size samples of 5 km x 5 km and systematic stratified sampling, we use photointerpretation of Landsat-8 imagery, available in the Google Earth Engine cloud platform, to provide estimates of winter crop areas. Multi-year validation results show consistent estimates of winter crop areas with approximately 10% error as compared to official statistics for 2013-2016.

Photo (above): Participants of the Joint GEOGLAM and Sentinel-2 for Agriculture Workshop that was held October, 10, 2016, in Kyiv, Ukraine.
The 3rd Open Science Meeting of the Global Land Programme (GLP) was held from October 24-27, 2016 at the China National Convention Center in Beijing, China. Several members of the UMD Department of Geographical Sciences attended and presented at the meeting: Professor Matt Hansen (who gave a Keynote presentation on the first day), Assistant Research Professor Ariane de Bremond (who is currently serving as Executive Director of the Global Land Programme and was on the organizing committee for the event), Assistant Research Professor Louise Chini, Assistant Research Professor Min Feng, and Postdoctoral Research Associate Xiao-Peng Song.

The meeting, attended by almost 700 participants, focused on all aspects of the Land System and stressed the role of land use as a sustainability solution, with particular emphasis on the conference themes of managing trade-offs and synergies for sustainable land systems; land systems and the food, water, energy nexus; land systems in an urbanizing and telecoupled world; and novel land governance systems to manage natural resources. Both plenary and parallel sessions involved discussion of social-ecological interactions around land use across a range of sub-disciplines and at many different levels of scale.
3rd Open Science Meeting of the Global Land Programme (GLP) in Beijing, China, continued...

Xiao-Peng Song, who presented on his work related to crop type mapping and area estimation using remote sensing and field survey data and who also organized a conference session for young scientists, said that “GLP is a highly interdisciplinary meeting and a good venue to interact with people with different background relevant to land change science. This is my 2nd time attending the meeting. I felt like US scientists were not well represented, at least not as well as European and Chinese scientists.”

The conference venue was adjacent to the 2008 Beijing Olympic Park and offered views of the iconic “Bird’s Nest” Stadium and “Water Cube” Aquatic Center. A traditional Chinese banquet was held one evening during which the new GLP logo was officially announced, along with the new GLP website (https://glp.earth). The next GLP Open Science Meeting will be held in two years, at a location still to be determined.

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**Photo (right):** The conference venue with views of the Olympic “Bird’s Nest” Stadium.

**Photo (left):** The China National Convention Center (conference venue).
UDM’s interactive campus webmap, which was first released in November 2013, received 1st place in the 2016 Esri International User Conference Map Gallery Competition (Use of an API category), as well as 3rd place at the user-judged User Applications Fair (http://www.esri.com/events/user-conference/exhibits/map-gallery-results), and was featured at the Esri UC Closing Session on July 1st, 2016.

According to an Esri blog post: “The University of Maryland Interactive Campus Map received the award for Using an API in a Map because of its ability to leverage many of the powerful capabilities of the ArcGIS platform through the API. This map has a clean interface and a wealth of information available on-demand.”

The UMD interactive campus webmap (http://maps.umd.edu/map/) utilizes the ArcGIS for JavaScript API and was designed to provide information related to the University of Maryland, College Park campus. The map has continuously evolved since its release as more features are developed and integrated and more university stakeholders contribute content.

Since its release the campus webmap has been accessed close to 1 million times and currently attracts over 1,000 page views per day. Peak usage on first day of classes (fall semester 2016) totaled over 10,000 sessions which was almost a 50% increase from the first day of classes in fall 2015. Use of the campus map continues to expand and the campus mapping system is being integrated with other core university information systems including the schedule of classes and various departmental websites.
The campus map project is a collaborative multi-department effort led by the Department of Facilities Planning in Facilities Management (FM) and the Division of Information Technology (D-IT). Data and application development work is heavily supported by academic interns from the Department of Geographical Sciences as part of the Campus GIS Internship Program, which was started in 2012 as a joint initiative between the Department of Geographical Sciences and Facilities Management.

Over the years, more than 50 student interns have assisted with the campus webmap and other campus datasets and applications. The Campus GIS team is always looking for creative ideas for enhancing the campus map and for assistance from interested and talented student interns every semester.

If you have any suggestions for the campus map or are interested in using campus data or information services for coursework or research please contact campus-gis@umd.edu. If you are a current undergraduate student and interested in the Campus GIS Internship Program please contact gis-internship@umd.edu or stop by the Geographical Sciences advising office for more information.
AGU Fall Meeting, December 2016

Photos (clockwise):
Dr. Ralph Dubayah, Douglas Rao, Dr. Xiopeng Song & Amy Pickens, Catherine Nakalembe, Suzanne Marselis, Dr. George Hurtt, Dr. Chris Justice
By Ana I. Sanchez-Rivera

Last September, over four hundred people, including five of our human geographers, attended the Race, Ethnicity, and Place (REP VIII) Conference held in Kent, Ohio. This biannual geography conference encourages the conversation of how ethnic and racial groups interact with their social and physical environments and welcomes different methodological and philosophical approaches to these topics. The REP characterizes for being a small but meaningful conference for geographers studying topics related to race and ethnicity. This year, the key speaker was Clarence Bozeman, the former driver of Martin Luther King Jr., who gave a powerful, inspiring and emotional speech about the life of the non-violent civil-rights activist. Among the department’s participants were: Dr. Martha Geores, and her Ph.D. candidates: Jennifer Hinojosa, Nayoung Jo, Joshua Wayland and I, Ana Sanchez-Rivera.

The presentations were well received among the sessions’ attendants, and once again, our department had to opportunity to show the wide-range of topics we research on, and the interdisciplinary perspectives we bring to our field. Our presentations covered topics such as unmasking micro-aggressions in forms of jokes against rural people; pull and push factors for migration within the states; the different effects that government’s disempowerment from natural spaces and resources have on the Native populations, and; the role that places have in the creation of identity and how they can be used to reconcile their residents with part of their history. For us, the conference was certainly a refreshing research and cultural experience and provided us with a great space for networking, reuniting with colleagues, many conversations over a couple-cups of coffee and inspiration. We want to thank our department for funding us and sponsoring this conference for the last 8 years.
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