UNIVERSITY OF MARYLAND

Department of Geographical Sciences

DEPARTMENT OF Geographical Sciences
BE GLOBAL

COLLEGE OF BEHAVIORAL & SOCIAL SCIENCES
THE SOLUTION

Summer 2016

GEOGRAFFITI

INSIDE

Testudo on his perch in front of McKeldin Library.

View from the Chair, Chris Justice

The last two weeks of the semester were unusually busy, grading student papers, proctoring and marking final exams, last minute PhD committee meetings, a number of college and departmental social events and finally graduation. This semester we graduated our largest number of students ever (82 undergraduates, 6 5th-year Masters and 5 PhDs). With our expanding program we are outgrowing our shared graduation ceremony, which we have been holding with African American Studies and Anthropology for the past 14 years. In early April, we held our annual Career Fair organized by Ron Luna and the advising office, providing an opportunity for seniors to talk with prospective employers. Our Professional Masters in GIS program continues to thrive, graduating 24 students this semester. The program hosts a booth at the annual meeting of the Association of American Geographers in Chicago, which this year saw increased attention from prospective graduate students. President Loh recently signed an MOU with Nanjing Normal University, which establishes our new China MPS GIS Program, envisioned and initiated by John Townshend and shepherded through to implementation by Mengxue Li and Jack Ma. The first cohort of students will come to Maryland in June of 2018. Renovation for our new Center for Geographic Information Science in LeFrak Hall is underway to create new GIS research space. This semester, 9 graduate students were awarded fellowships including 2 Fulbright, 2 Boren, 1 NSF, 1 Ford, a University Flagship Fellowship and a Lee Thornton Dissertation Fellowship, which is a record

View from the Chair, continued....

for the Department and a testament to the quality of our students and their advisors. We celebrated this success with a graduate student appreciation social event and were treated to a reenactment of the death of Julius Cesar. Cesar was played by Julie Silva, and a number of graduate students conspired to make it an interesting event. We also held a reception for Wilhelmina Johnson who has been the face of the Department in our front office and is retiring at the end of June, after almost 20 years. Staff, faculty and students will all miss her cheerful manner and her early morning presence in the front office. The front office continues to be understaffed and we have recently hired a new Research Coordinator, Marc Lennon, to help with our expanding research program. We are looking forward to a productive summer of research and two new faculty members, Leila DeFloriani and Grant McKenzie, joining our ranks in the fall.

Words from the Research Director, George Hurtt

2015 was the hottest year on record globally since modern record keeping began in 1880, by the largest margin, with 15 of the 16 warmest years all since 2001. It was also a tipping point in collective human action to address the issue of climate change. First, the United Nations released the 2030 Agenda for Sustainable Development, calling for urgent action to combat climate change as one of 17 sustainable development goals. Then in December, the UN Conference of the Parties met for the 21st time and reached a landmark international agreement to limit future global warming to 2 degrees C or less. This year the momentum continues. On Earth Day 2016, countries around the world signed into effect Nationally Determined Commitments to reducing emissions. This May, the Climate Action Forum hosted by UMD, and following the Climate Action Summit co-sponsored by UMD, began the international discussions on implementation. In all this, GEOG has been active, out ahead, and is well positioned for the future. Two professors were panelists for a session on Carbon Monitoring and Modeling in the Land-Use Sector (Hansen, Hurtt). Additionally, five other professors presented in the session on Climate Change, Poverty and Vulnerability (Baiocchi, Feng, Hubacek, Silva, Sun). GEOG was extremely productive on many other topics and venues as well! The first GEOGLAM Early Warning Crop Monitor bulletin was released (Becker-Reshef). A regional meeting on land use in Yangon, Myanmar, attracted 150 participants from 12 counties. New papers demonstrated the importance of small disturbances for predictions of tropical forest vegetation dynamics and carbon flux (Hurtt, Fisk, Dubayah), the spatial pattern of young forests and carbon fluxes within recent disturbances in Russia (Loboda, Chen), remote sensing for chimpanzee habitat monitoring (Jantz, Hansen), and the potential redistribution of vegetation and carbon with climate change (Flanagan, Hurtt, Dubayah). Outreach picked up as well. *Scientific American* published an article on forest 3-D structure (Hansen, Duncanson), and the Diane Rehm Show discussed the intense fire that has been raging in the boreal region of Alberta, Canada, for nearly a month leading to the evacuation of some 100,000 people (Loboda). Many of our faculty and students received research awards. Four faculty were recognized at the 9th Annual University-Wide Celebration of Scholarship and Research (Huang, Hubacek, Loboda and Sexton) and Matt Hansen won the Dean's Research Award. Please welcome new Research Faculty members – John Armston, Ben DeVries, Katelyn Dolan, Junchuan Fan, Christina Justice and Xia Li – and offer our best wishes for continued success to departing members Megan Lang, Caspar Chung and Tetsuji Tanaka.

Mapping Land Surface Albedo from VIIRS Satellite Data

By Dongdong Wang

Land surface albedo (LSA) is the ratio between incoming and outgo-ing shortwave radiation at the Earth's land surface, characterizing surface reflectivity. For example, highly reflective surfaces such as snow have higher albedo values (~0.8) and albedo of dark objectives such as vegetation is relatively small (~0.2). Land surface changes can greatly alter surface albedo, and consequently affect the climate system. In the perspective of shortwave radiation budget, afforestation has warming effect because bare ground is covered by vegetation that has relatively lower albedo and this change means more shortwave radiation is absorbed. Similarly, urbanization has a cooling effect because dark vegetated surfaces are converted to man-made objectives that have higher albedo and reflect more solar energy.

Ground stations can provide well-calibrated accurate measurements of albedo. However, such data are available only with limited spatial coverage. Because albedo is highly variable both spatially and temporally, satellite remote sensing is the ideal technique to map global albedo on a regular basis. Several satellite albedo products have been developed with different retrieval algorithms and from various satellite data.

Work is being conducted on developing albedo retrieval algorithms, validating and analyzing albedo products, investigating interactions between albedo and climate changes for more than a decade. Recently funded by the National Oceanic and Atmospheric Administration (NOAA) through the Cooperative Institute for Climate and Satellite (CICS), our team is working on algorithm refinement and product validation to support Visible Infrared Imaging Radiometer Suite (VIIRS) LSA product.

As replacement of the successful Moderate Resolution Imaging Spectroradiometer (MODIS), VIIRS has similar spatial resolution, spectral configuration and slightly wider swath. Observations from VIIRS onboard the Suomi National Polar-orbiting Partnership (Suomi NPP) and future Joint Polar Satellite System (JPSS) missions provide a valuable data source to regularly monitor global LSA from space. The major tasks of this project include algorithm development and refinement, product calibration and validation, and long-term data monitoring. Validation and inter-comparison has demonstrated the improved VIIRS LSA data have comparable or superior quality to existing LSA satellite products.

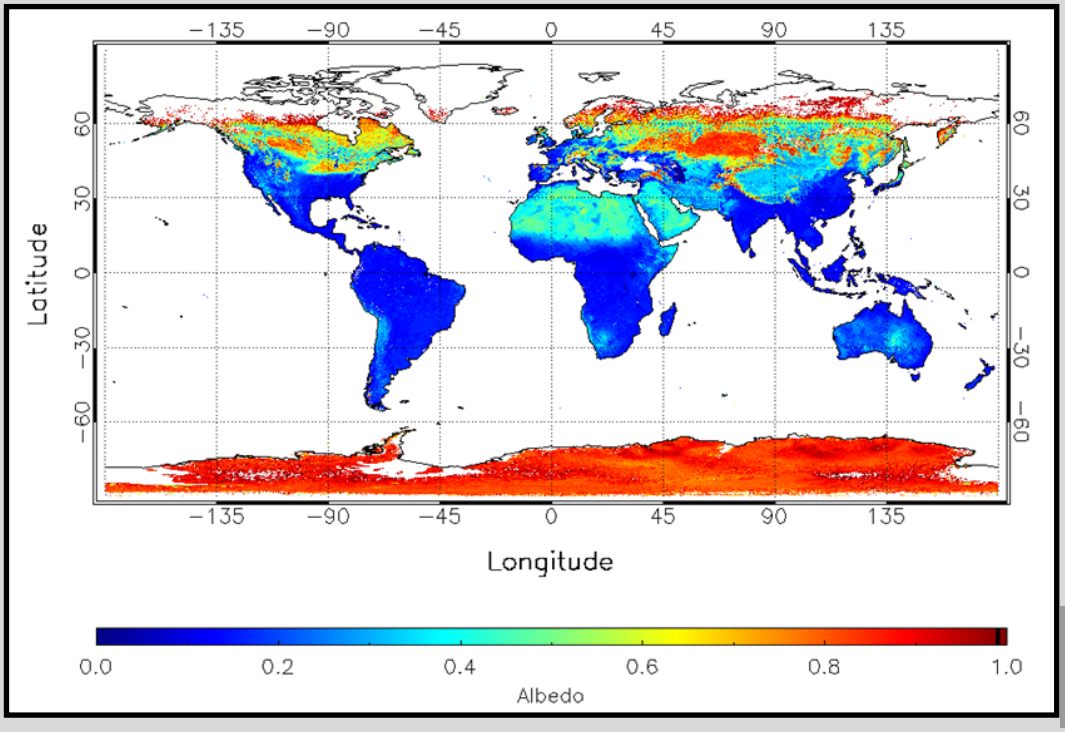


Figure: An example of global land surface albedo map from VIIRS (composite from February 1-16, 2015.

Supporting Malaria Elimination Interventions in Myanmar Through Mapping and Modeling

By Tatiana Loboda and Demian Rybock

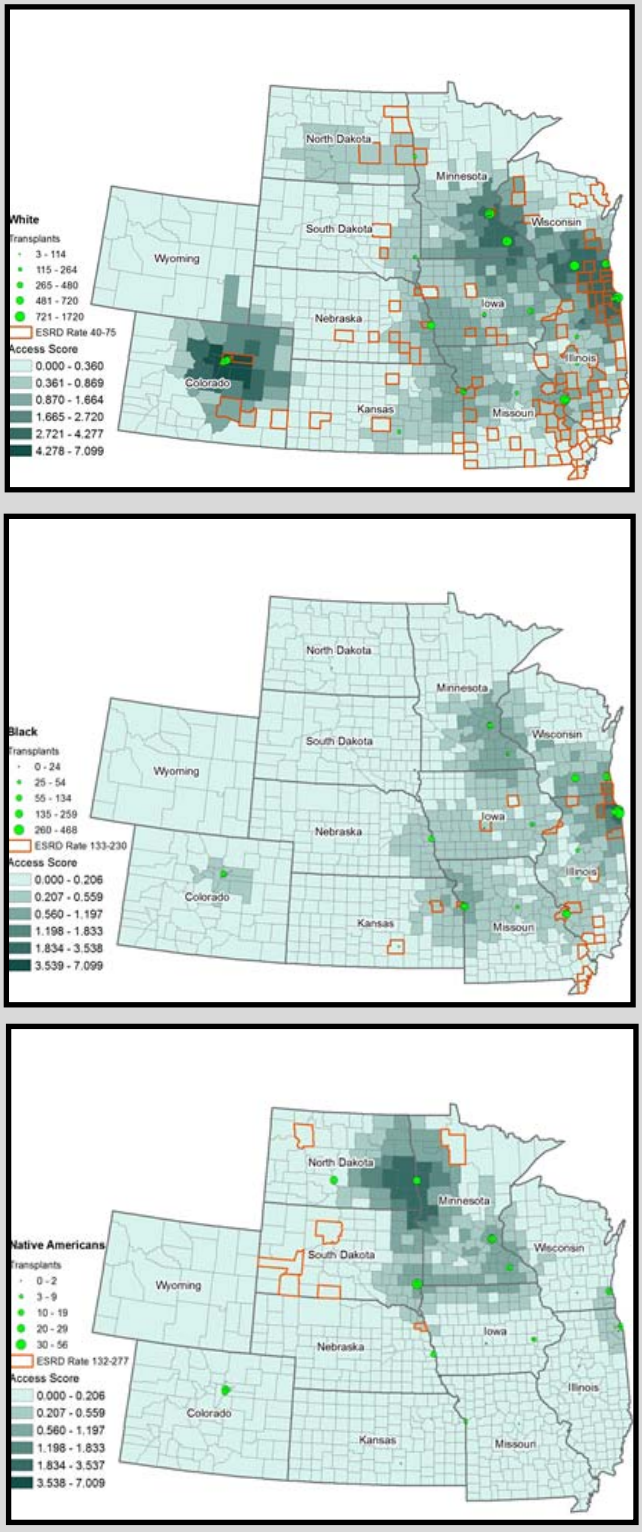
Myanmar, the emerging democracy formerly known as Burma, and the Southeast Asian country with by far the greatest malaria burden in the region, has been a historical gateway for the dissemination of drug-resistant malaria to India, China and the rest of the world. For decades this country has been cut off from the region and the world through economic sanctions substantially limiting the amount of international support for malaria elimination efforts. Internally the country has also been affected by the military conflict and, subsequently, a very uneven distribution of malaria treatment options across the country. As a result, malaria remains widespread in Myanmar and, in conjunction with the observed genetic mutations that leave the parasites resistant to currently available malaria treatments, poses a threat to malaria elimination efforts elsewhere. With funding from the Bill and Melinda Gates Foundation, Drs. Christopher Plowe and Myaing Myaing Nyunt in the Institute for Global Health (IGH) at the University of Maryland School of Medicine are working with scientists and medical practitioners in Myanmar and the World Health Organization to completely eliminate falciparum malaria in the region. Drs. Tatiana Loboda, Kathleen Stewart and Faculty Specialist Demian Rybock in the Department of Geographical Sciences are collaborating with the IGH team to develop, improve, and validate innovative new surveillance tools that will form a geospatial surveillance toolkit for malaria elimination in Myanmar and the region. In this work, they support the planning and implementation of clinical field campaigns through an online GIS mapping platform, provide visualizations of the spatial distribution of malaria infection across the country, and map patterns of emerging and spreading resistance to artemisinin and parasite migration flows. The team from Geographical Sciences are further planning to examine the impact of environmental conditions and human mobility on malaria exposure and launch a malaria risk forecasting system based on the results of epidemiological surveillance, satellite remote sensing, and geospatial modeling.

Photos: (above/right) Tatiana Loboda explaining the possibilities offered by geospatial modeling at the Institute for Global Health in Yangon, Myanmar; (left) Tatiana Loboda and Demian Rybock in front of the Shwedagon Pagoda in Yangon.

Stewart and Cao Broach Study on Geographic Patterns of Renal Disease in the U.S. Mid-West

By Kathleen Stewart

In June of 2016, Professor Kathleen Stewart, PhD Student Yanjia Cao, and Dr. Roberto Kalil, Medical Director of the VA Kidney Transplant Program, University of Iowa Hospitals and Clinics, published a paper entitled, "Geographic patterns of end-stage renal disease and kidney transplants in the Midwestern United States" in *Applied Geography*. The research investigated geographic patterns of end-stage renal disease (ESRD) and kidney transplantation at county level in a study area that covers eleven states in the MidWest U.S. during 2004-2011. This research analyzed the degree to which disparities for different population groups (white, black, and Native American) of ESRD patients might exist with respect to the occurrence of ESRD and spatial access to kidney transplantation. The kidney transplant rate is 73% lower among black ESRD patients than for white patients in this study region. Spatial accessibility to kidney transplants was analyzed using the enhanced two-step floating catchment area method to account for dissimilarities in treatment catchment sizes due to varying travel times and county populations. We found that Native American and black population groups have lower overall spatial access scores than other groups. Patients in rural counties have higher ESRD incidence rates and lower spatial access scores than those in urban counties. The results found that 76% of counties in the study area that correspond to the highest ESRD incidence rates correspond to the lowest two categories of spatial accessibility (Figure 1a, 1b, 1c – right). These results provide the impetus for further exploration of spatial patterns for end-stage renal disease in other regions of the U.S.



Figures 1a/b/c: A mismatch was found between end-stage renal disease (ESRD) incidence hotspots (2004-2011) (mapped in orange) and spatial accessibility to kidney transplant (mapped in green) for patients that are (a) white (b) black and (c) Native American in the U.S. Midwest. This mismatch map was most significant for Native Americans residing in the study area.

UAV Mapping of Uganda Refugee Settlement for Climate Resilience

By Jan Dempewolf

GEOG Assistant Research Professor Jan Dempewolf and PhD Candidate Catherine Nakalembe are helping to drive innovation in Uganda by using the latest technology to support environmental risk assessments in the country's oldest refugee settlement, Oruchinga. Together with staff from the Office of the Prime Minister (OPM) of Uganda and the settlement headquarters they successfully completed the first ever refugee settlement base map.

The work was carried out as part of the UNDP Integrated Climate Risk Management Programme (ICRMP) funded by the Government of Sweden. The program supports the integration of climate resilient approaches into existing livelihood activities in Oruchinga. The majority of inhabitants are engaged in agriculture, growing mostly maize, bananas and vegetables on allocated land. The scope of the ICRMP encompasses improved climate risk management of homestead gardens and agricultural plots, tree management and the rehabilitation of degraded land through afforestation as well as support of small scale fishing and pond management. The new detailed orthophoto-mosaic and digital surface model will provide the necessary foundation for the baseline assessment of land cover and land use, environmental conditions and soil fertility. The mapping was carried out using a fixed-wing unmanned-aerial vehicle (UAV). The total area covered was 17 km2 during a three-day period, resulting in more than 1200 [continued on page]

Photo: (top) Catherine Nakalembe and Jan Dempewolf explain UAV operations to Oruchinga Settlement Commandant Amos Kirya. (bottom) Digital surface model of the settlement area and classification results of sand mining sites.

UAV Mapping of Uganda Refugee Settlement for Climate Resilience continued....

individual aerial photographs. A first analysis of the new data revealed extensive sand mining as a destructive land use competing with agriculture and permanent destruction of the landscape (photo).

The Settlement's Commandant, Amos Kirya, said that the current maps used are long outdated and not conducive to participatory decision making. He added that the new map will also assist OPM in resettlement planning as they will have a complete and up-to-date picture of the settlement's land use. Other commandants visiting Oruchinga during the field campaign voiced their support of the initiative and expressed interest in carrying out similar mapping efforts in their own jurisdictions, many of them encompassing much larger refugee camps and settlements. The effort was also warmly welcomed by the Permanent Secretary of Agriculture of Uganda.

Department Members Meet with the Permanent Secretary of the Ministry of Agriculture Tanzania

By Jan Dempewolf

On April 30, 2016, the AgriSense STARS team Jan Dempewolf and Catherine Nakalembe (UMD GEOG) met Florens Turuka (Permanent Secretary for Agriculture at Ministry of Agriculture, Livestock and Fisheries, MALF) in Tanzania to present and discuss the impact and outcomes of the project at the ministry. The meeting was also attended by Nkuvillwa Simkanga (Director of Policy and Planning, MALF), Kate Schneider and Stanely Wood (Bill and Melinda Gates Foundation), and members of the National Food Security Division.

The AgriSense-STARS work is supporting the re-design and planned implementation of the National Food Security Bulletin (NFSB), which had been discontinued in the early 2000s. Some of the information and data that forms the basis of the current National Food Security Bulletin is drawn from tools designed by UMD including the Global Agricultural Monitoring System (GLAM) East-Africa, and the Tanzania Crop Monitor. Analysts at MALF use GLAM data.. [continued on page 8]

Photo: Meeting attendees included UMD AgriSense STARS team, representatives of the Bill and Melinda Gates Foundation, the Permanent Secretary of Agriculture and leading representatives of the Ministry of Agriculture in Dar es Salaam, Tanzania.

Department Members Meet with the Permanent Secretary of the Ministry of Agriculture Tanzania continued....

Which is field data collected electronically using project designed instruments and conventional data to complete assessments in the Tanzania Crop Monitor, which feed directly into the NFSB.

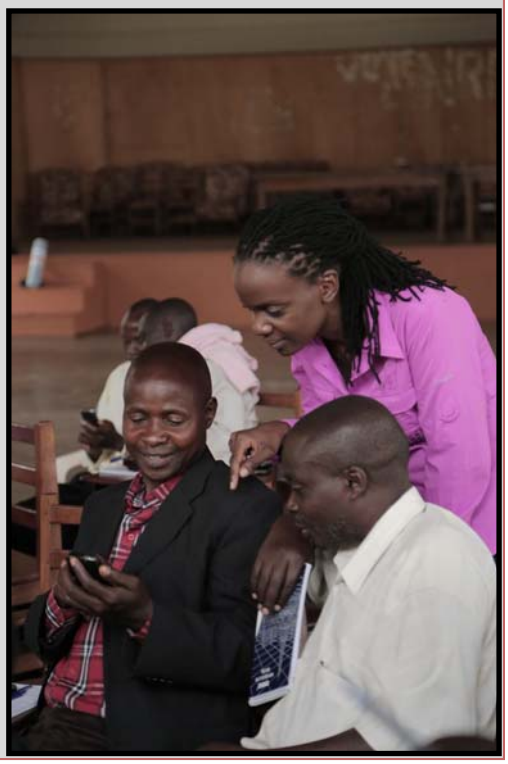
The Permanent Secretary expressed strong interest and commitment to operationalize these tools since they align well with their efforts and will support the planned Agricultural Sector Development Programme (ASDP II), which aims to enable farmers to have better access to and use of agricultural knowledge, technologies, marketing systems and infrastructure. The government requested support for expansion of electronic field data collection using smartphones to national coverage that would form sound data in support of decision making. The project team is currently seeking new funding to continue these efforts and to further enhance and develop advanced remote sensing, GIS and ICT based agricultural monitoring tools and methods and provide capacity building.

Regional GeoODK Training in Masaka, Uganda

By Christina Justice and Catherine Nakalembe

April 12 - 13, 2016, the University of Maryland (UMD) in partnership with Sustainable Enterprises for Trade Engagement (SENTE), a Lutheran World Relief (LWR) program led a training in Masaka, Uganda, to implement regional data collection for food security monitoring across Central 1 region, Uganda.

The objective of the training was to pilot crop condition monitoring using tools developed by the AgriSense-STARS project across the Central 1 region, building off already existing capacity developed through SENTE program. The pilot is to acquire monthly field data collection on crop conditions for food security monitoring using the GeoODK application, developed by UMD, and smartphone infrastructure already present through the LWR SENTE program.



The training facilitators included Catherine Nakalembe and Christina Justice (UMD GEOG), Bruce Kisitu (Project Management Consultant at Gutsinda Development Group), and Georgina Nakubulwa (SENTE program manager). Workshop participants included 68 Village Extension Agents (VEA) from across the Masaka region. The electronic data collection forms to be collected over the growing season were reviewed by the group as a whole and discussion sessions were held to review and provide feedback on the accessibility and accuracy of the forms developed. Each participant was given the opportunity to voice input on the data collection forms they will be using in the field collection campaign.

Regional GeoODK Training in Masaka, Uganda continued...

After completion of the training, Nakalembe, Justice and Kisitu traveled with VEA Byamykama Jackson to Lwengo District to observe field data collection in action. Jackson collected pre-season and in-season forms for two Farmers in Byembogo B Village. Nutrient deficiencies were found due to heavy rain and flood events in the district for the months of February and March. Recommendations were given to the farmer to replace and conserve nutrients in the soil both in the coming months if rains persist and long term including planting agroforestry trees throughout the field to help to replace nutrients leached from the soil. Feedback from the VEA focused on the need for improved data collection devices, but found the forms to be user friendly and representative for his district.

This training marks the inception of an invaluable partnership between UMD, LWR, and Gutsinda to establish a multi-platform data collection initiative for livelihood, food security and crop condition monitoring providing near real time data (on such things as pests, disease, growth stage, and market price of maize, beans and coffee) to key decision makers and stakeholders with the goal of improving livelihoods for smallholder farmers across Uganda.

Photo above: Training workshop participants at the Masaka Community Center, Uganda.

UMD Wild Women in Geography Stand for Gender Equality

By Nicole Motzer

A recent study found that 88% of women nearing the completion of their doctoral programs plan to forego careers in academia. This statistic, much greater than rates found for male graduate students, reflects many of the biases, impediments and sacrifices that women academics experience on a daily basis as well as over time. A man with children in Spain, for instance, is four times more likely to become a full professor than is a woman with children. Further, research shows that changing the name on a job application from a man's to a woman's, but maintaining identical qualifications, decreases employers' perceptions of competence and lowers the applicant's chances of hire. For women who do get hired, it is then often with conditions of unequal pay for equal work.

In the Department of Geographical Sciences, the Wild Women in Geography (WWIG) group, which is open to both men and women and which can also be found at numerous other universities, represents one small way in which geographers at the University of Maryland are attempting to increase dwindling retention rates and improve the professional and social experiences of emerging, as well as established women, in academia. At bi-monthly WWIG gatherings, hosted in Maryland as well as Washington D.C., faculty members and graduate students from a variety of cohorts enjoy opportunities to network, mentor, exchange ideas and build collaborations over food and drink.

At first glance, such gatherings may appear insignificant or unneeded, yet this is far from the case. Upon leaving WWIG events, attendees return to their desks and to the difficulties faced in the pursuit of PhDs and in life generally, but we return to such things with the knowledge that we are supported and that our experiences as women are acknowledged or shared by others at the university. The fight for gender equality is a global one and it is far from finished. However, coming together as we do and with the support of our department and our male colleagues, we know that bit-by-bit, being a woman, and especially in academia, will no longer be a battle won, or an opportunity lost. It will simply be.

Photos above: WWIG gatherings in October of 2015 and April of 2016

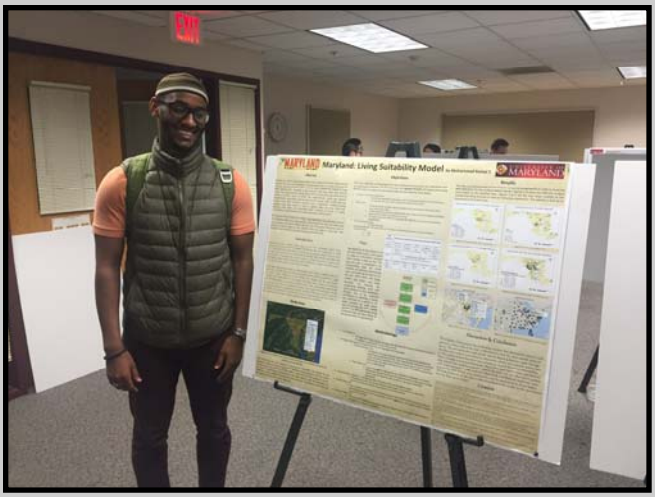
Department Celebrates the 2016 Lunar New Year

By Yuhan Rao

On February 18th of this year, the department hosted its third Lunar New Year celebration. More than sixty faculty members, students and staff came together to celebrate a promising Red Fire Monkey year. The celebration was kicked off by warm welcoming remarks from the Chair, Dr. Chris Justice, to celebrate department achievements over the last year and wish everyone a productive, upcoming year. After that, an impressive dance performance fusing traditional and contemporary Chinese art was presented by PhD student, Pan He. The dance was followed by a delightful presentation discussing the traditional Lunar New Year celebration amongst various Asian countries, including stories about the Chinese zodiac offered by PhD student Weishu Gong. After the presentation, savory Chinese cuisine was offered to all attendees, including a delicious, homemade sticky rice cake provided by Jenny Hu. While people were enjoying the tasty food, several fun cultural activities including calligraphy, lantern-making, tea tasting and Chinese chess were also presented by students and visiting scholars in the department. Additionally, red pockets were given to all attendees as New Year's gifts for everyone in the department. This event provided an excellent opportunity for everyone in the department to gather together and enjoy some comradery after another year of hard work. It also set the tone for a fresh start to the promising Lunar New Year of 2016. The celebration is supported by the department and organized by PhD students Yuhan Rao, Yanjia Cao, Weishu Gong, Cheng Fu, and visiting scholars Hongmin Zhou, Qian Wang and Delin Fang. We would also like to thank the Confucius Institute at UMD for providing various Chinese decorations for the celebration.

MPS/GIS Program holds 2016 Capstone Poster Symposium

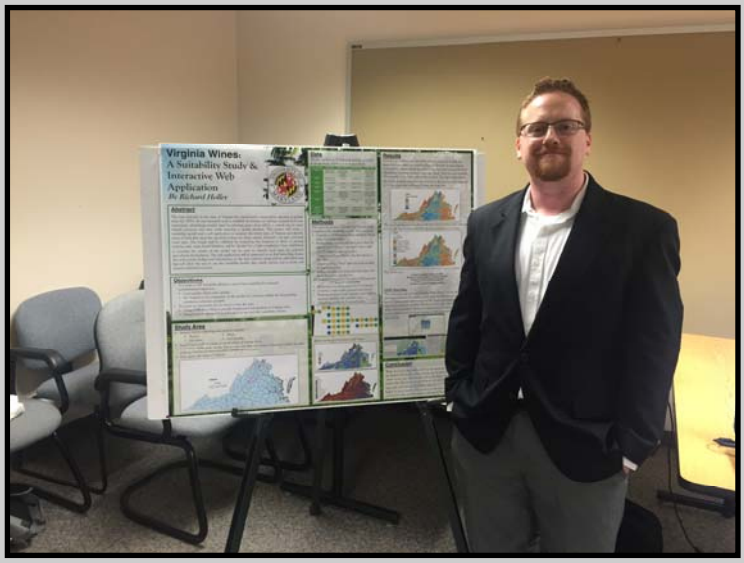
By Jonathan Resop



On May 11th, the MPSGIS program had their annual spring poster symposium. The event features the final capstone projects of the MPSGIS graduating class. The capstone class is a professional, independent project that all MPSGIS students complete at the end of their degree. Capstone projects feature a combination of research-based projects and design-based projects. This year 21 students participated in the spring capstone symposium.

Example projects included the work of Cynthia Hartley, the MPSGIS Student of the Year, whose project title was "Reading a Bird's Mind with Lidar: Western Snowy Plover Nest Site Selection." For her project, Cynthia used topographic metrics derived from high-resolution lidar data to predict the locations of western snowy plover (WSP) nests and study the differences between two sites: a public beach in California and a nearby Navy facility. Using regression, Cynthia found that WSPs tend to prefer nesting along flatter, smoother terrain. However, even though these variables were shown to be significant predicting nest locations, the type of beach access (public beach or private Navy facility) seemed to be the most important explanatory variable.

As another example, Marut Tangtrongwanit, who was this year's ESRI Development Center Student of the Year for the University of Maryland, presented his project entitled, "Citizen Service Request Application for Local Governments – College Park, MD." For his project, Marut developed an online, mobile-friendly application that allows citizens of a community to report service requests for their local government. The goals of the application are to not only make it easier for citizens to report issues but also to make it easier for local government officials to dispatch responders to requests as quickly as possible. This is extremely important for time-sensitive issues in a community.



Overall the event was a great success and was well attended by departmental faculty and students who had a chance to listen to the capstone students present their work. We wish to congratulate all of our MPSGIS spring graduates for their hard work in completing their capstone projects!

Photos: MPS/GIS students Mohammed Kemal S (top) and Richard Holley (let) standing next to their contributions.

GEOG Commencement, May 2016

Department Involvement in InfoCongo.org Aims to Increase Transparency in Natural Resource Management in Central Africa

By Giuseppe Molinario

Photo: Giuseppe Molinario (far right) and journalists from various African countries.

From April 18 – 22, 2016, InfoCongo.org held a workshop in Yaounde, Cameroon, bringing together 15 Central African environmental journalists to network and share experiences on science and data-driven geojournalism. InfoCongo.org is a web platform and network-building project with the objective of increasing the capacity for data-driven environmental journalism in the Congo Basin. The project started in 2015 and has been led by UMD Global Land Analysis & Discovery together with the Earth Journalism Network (EJN) of Internews with 5 year funding from USAID CARPE.

InfoCongo.org works mostly on two parallel tracks: one is the creation of a website where environmental stories are georeferenced and provided with a suite of thematic maps and filters; some reported independently by contributors and others georeferenced from existing sources such as Mongabay or the Congo Basin Forest Partnership (CBFP). The other activity is to build the capacity of Central African geojournalism by providing trainings, workshops and story-grants for in-depth reporting using both social media as well as in-person events.

Journalists representing Cameroon, Central African Republic, Gabon, Democratic Republic of the Congo and Republic of the Congo visited the CRELICAM ebony saw mill, owned by the Taylor guitar company and famous for it's efforts in making the ebony market for musical instruments more sustainable. The visit was possible thanks to the partnership with the World Resources Institute, particularly James Anderson, communications officer of Global Forest Watch. Workshop co-organizers Gustavo Faleiros and David Akana of EJN were excited to show the journalists a sustainable forestry success story. The diversity of the media outfits represented varied, from smaller radio outfits up to the correspondent of the BBC world service. The latter did individual interviews with the CRELICAM general manager and Bob Taylor himself. The level of understanding of the journalists of forestry, sustainability and environmental and social issues was often surprising. Indeed, many critical questions were asked regarding corruption, price paid for the work to the forest workers, replanting programs, governance and sustainability. Hopefully the resulting articles written about Taylor and CRELICAM will be more balanced and thought-provoking than prior ones, showing both a positive impact on the ebony industry as well as remaining issues.

Photo: Operations manager of CRELICAM being interviewed by a Yaounde correspondant of the BBC and other InfoCongo workshop attendees.

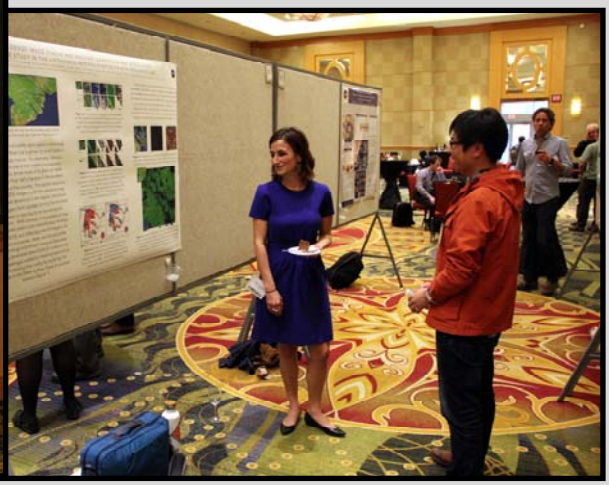
Celebrating 20 Yrs of NASA's Land Cover/Land Use Change Program

By Sumalika Biswas and Chris Justice

The NASA LCLUC program celebrated its 20th anniversary at the annual spring Science Team Meeting held on April 18 -19, in North Bethesda, MD. To mark this special occasion, the meeting focused on past accomplishments, current LCLUC issues with discussions on future directions to advance research, and a special session on industrial forests. The meeting was attended by more than 100 U.S. and international scientists and graduate students. GEOG has played a major role in the development of this unique NASA program, which combines remote sensing, physical and social science to study land use change. Chris Justice has been the Project Scientist for this program since its inception and over the years, a number of our graduate assistants have been funded to help support program. Several researchers from our department have been successful grant recipients, from the first funded science team, which included Eric Kasischke and Steve Prince, to recently funded PIs including Chengquan Huang, Matt Hansen, John Townshend, Joe Sexton, Inbal Becker Reshef, Tatiana Loboda, Megan Lang and In-Young Yeo. Krishna Vadrevu was appointed to coordinate the new South and Southeast Asia Research Initiative (SARI), which is supported by LCLUC.

After a formal opening offered by Chris Justice, Garik Gutman shared his experience of almost two decades with the LCLUC program and its partners. Chris Justice provided updates on the current status, and future directions in which the program could expand, ending with an acknowledgement of the invaluable contribution of John Townshend. LCLUC keynote talks were delivered by Eric Lambin and David Skole. Lambin discussed telecoupling and land use governance influence investments in land systems and encouraged particular land uses, while Skole discussed the evolution of land cover data sets in the past two decades and noted that the evolution is accompanied by a shift in focus from pattern to process oriented applications. A panel discussion on the 'Past, Present and Future of LCLUC Science' followed, concluding that technology and policy changes have increased data availability and enabled the community to look beyond land cover patterns, into land use processes that drive them, something that couldn't be done 20 years ago. Suggestions to further advance research included improvements in methods and a deeper understanding of climatic-socio-economic-landcover systems. The session on regional synthesis included presentations on the results of synthesis studies in Northern Eurasia and South/South East Asia. It was followed by a two-minute rapid poster session, poster viewing and celebratory reception. The reception, sponsored by SGT and SSAI, recognized and honored the accomplishments of all LCLUC PIs and alumni over the last two decades.

Celebrating 20 Years of NASA's Land Cover/Land Use Change Program continued...



Department Organizes Regional Land-Use Meeting in Myanmar

By Krishna Vadrevu

Krishna Vadrevu and Chris Justice organized a regional meeting on Land Use in Yangon, Myanmar (January 12-18, 2016), with support from the NASA Land Cover Land Use Change (LCLUC) Program, the global change SysTem for Analysis, Research and Training (START) and the international Global Observation for Forest and Land Cover Dynamics (GOFC-GOLD) Program. 150 participants attended the meeting representing 12 countries. Matt Hansen, Tatiana Loboda, Chengquan Huan, Evan Ellicott, Demian Rybock and Sumalika Biswas from the Department of Geographical Sciences also attended the meeting to strengthen their research collaborations within the region. The purpose of the international meeting was to provide a forum to discuss LCLUC and its impacts, with a regional focus on South and Southeast Asia.

The program included an LCLUC field trip to Bago, a small city located 50-miles north-east of Yangon. 45 international participants attended the field trip. In addition, the program also included two days of training for 60 local scientists on the use of remote sensing and geospatial technologies for monitoring agriculture, urban areas and forests. In Myanmar, population growth together with rapid economic development is causing immense pressure to convert land from forest to agriculture and from agricultural areas to residential and urban uses, with significant impact on ecosystem services. Increased LCLUC in the region is disrupting and perturbing forest resources, biodiversity, regional climate, biogeochemical cycles, water resources and other ecosystem services. Developing appropriate and effective land use policy is key to the sustainable development of countries in the region. The meeting was endorsed by the President of Myanmar with guidance from the Ministry of Environment, Conservation and Forests (MOECAF) and was hosted by the Department of Geography colleagues at the University of Yangon, Myanmar.

Photo (counter-clockwise): Department attendees Chris Justice, Krishna Vadrevu, Evan Ellicott… Sumalika Biswas, Tatiana Loboda, Matt Hansen and Chengquan Huang.

UMD GLAD Team at the AGU Fall Meeting 2015

By Alexandra Tyukavina, Viviana Zalles and Qing Ying

Six researchers from the Global Land Analysis and Discovery (GLAD) team presented their research at the annual American Geophysical Union (AGU) Fall Meeting in San Francisco in December, 2015.

Assistant Research Professor Janet Nackoney presented results of a joint UMD and Jane Goodall Institute project on mapping and monitoring chimpanzee habitat health in Africa. Post-Doc Research Associate Alexandra Tyukavina presented a new sample-based estimate of carbon loss in the tropics, and talked about the GLAD research at the AGU Google booth. Post-Doc Research Associate Xiaopeng Song showed methodology and results of soybean mapping and area estimation in the conterminous United States. Ph.D. candidate Qing Ying presented her proposed methodology of global bare ground mapping and area estimation, and its preliminary results. Doctoral student Viviana Zalles conducted a poster presentation on the mapping of proximate causes of deforestation in Brazil. Remote Sensing Scientist Amy Hudson presented the concept of global surface water dynamics mapping and visualization. The variety of topics presented reflects current major research projects lead by the GLAD team members.

Photo (left to right): Viviana Zalles, Janet Nackoney, Alexandra Tyukavina, Amy Hudson, Qing Ying and Xiaopeng Song.

NASA Biodiversity and Ecological Forecasting Team Meeting

By Janet Nackoney

Each year, NASA holds its annual Biodiversity and Ecological Forecasting Team Meeting, comprised of a series of presentations and discussion sections for principal investigators and their designees funded by NASA's Biodiversity Program (a NASA Earth Science Research and Analysis Program activity) or the NASA Ecological Forecasting Program (a NASA Earth Science Applied Sciences Program activity). Four researchers participated from the Department of Geographical Sciences, which was held in early May in Silver Spring, Maryland.

Drs. Joe Sexton and Jyotheshwar Nagol participated in the context of their joint project with Utah State University in a presentation titled "Spatial Responses to Climate across Trophic Levels: Monitoring and Modeling Plants, Prey and Predators in the Intermountain Western U.S." The team has monitored the seasonality of plant productivity using satellite observations and used the results to model the movement and demography of deer, elk, bighorn sheep, and mountain lions across the western United States. They have been funded by NASA's Biodiversity Program for 4 years.

Dr. Janet Nackoney and PhD student Sam Jantz also attended to present their work on chimpanzee habitat modeling and monitoring with Dr. Lilian Pintea of the Jane Goodall Institute (JGI). As part of their project, they are developing a web-based decision support system that will map changes in chimpanzee habitat quality annually using Landsat satellite imagery. They have been funded by NASA for two years.

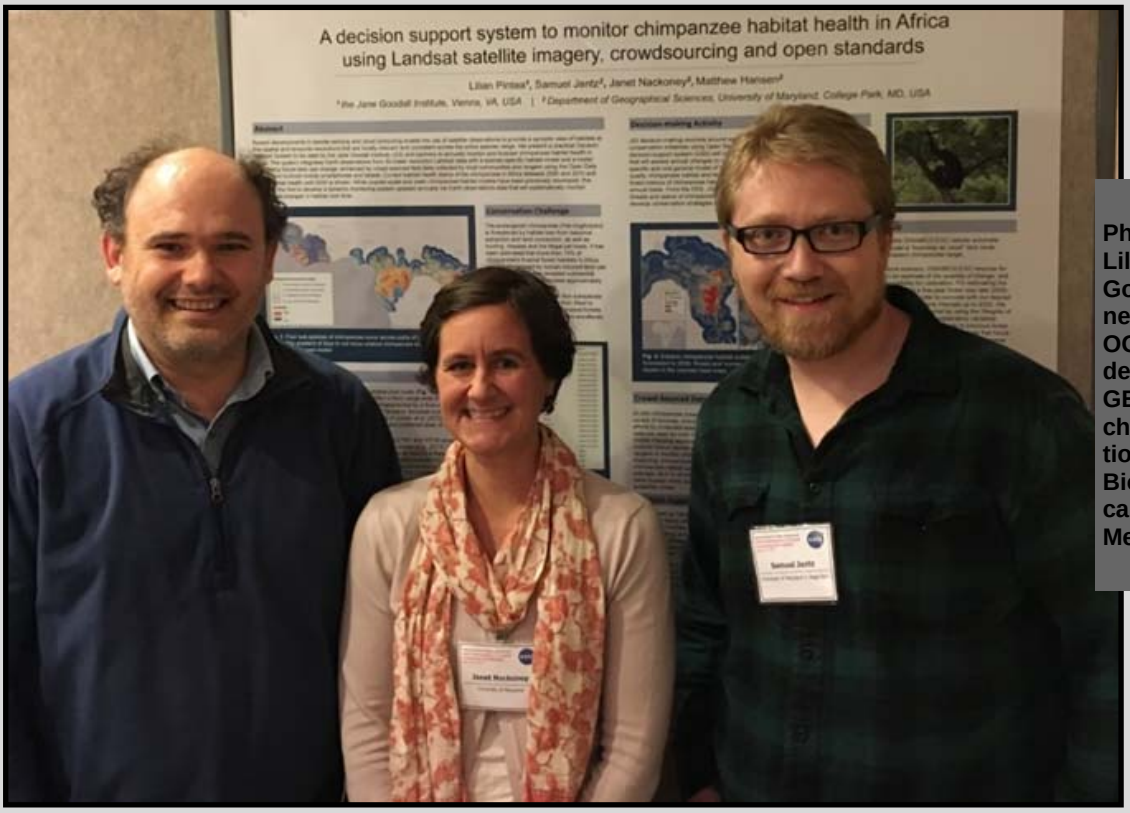


Photo: (from left) Dr. Lilian Pintea of the Jane Goodall Institute, Dr. Janet Nackoney (UMD GEOG) and graduate student Sam Jantz (UMD GEOG) presented their chimpanzee conservation work at the NASA Biodiversity and Ecological Forecasting Team Meeting.

GEOG Represented at the 2nd Joint EARSeL SIG LU/LC and NASA LCLUC Workshop, Prague

By Alexandra Tyukavina

The second joint workshop of EARSeL Special Interest Group on Land Use and Land Cover (SIG LU/LC) and NASA Land-Cover Land-Use Change (LCLUC), "Advancing horizons for land cover services entering the big data era," took place May 6-7, 2016, at Charles University in Prague, in support of and preparation for the following ESA Living Planet Symposium (May 9-13, 2016). The workshop was focused on discussing Landsat and Sentinel-2 harmonization approaches, mapping land cover and land use with cross-scale and cross-sensor data, challenges of using dense time series of remotely sensed data in land cover and land use monitoring, and the benefits of earth observations for ecosystem services and human wellbeing.

UMD Department of Geographical Sciences was represented with two keynote presentations. Professor Christopher Justice presented and overview of the current state and future perspectives of the use of earth observations for agricultural monitoring and food security. Dr. Alexandra Tyukavina presented on UMD Global Land Analysis and Discovery (GLAD) global Landsat-based land cover monitoring, and the potential of incorporating Sentinel-2 data into processing workflow, to improve temporal resolution of monitoring and move towards near real-time implementations.

AAG 2016 Through the Student Lens

This spring, seven doctoral students attended the annual meeting of the American Association of Geographers. They joined attendees from over 87 different countries from around the world to present on topics as diverse as environmental drivers of migration; the influence of memory on the formation of place attachment post-resettlement; and the use of skin color, location, and place as racial identifiers. These seven students were Kelly Anderson, Sumalika Biswas, Yanjia Cao, Ashley Enrici, Ana Sanchez-Rivera, Michael Strong and Joshua Wayland. Their research presentations and poster sessions discussing field work helped elevate the department's name recognition for contributions to human dimensions of global change. — Mike Strong

Photos: (left) GEOG PhD students Kelly Anderson and Michael Strong, volunteering at the Department booth; (below) GEOG PhD student Anna Sanchez-Rivera enjoying a break from the conference.

In April of 2016, I attended the AAG conference in San Francisco and presented on my research entitled, "Quantifying the Influence of Climate on Urbanization and Deforestation in Africa: The Case of Mozambique," which examines migration in the context of increasing globalization and environmental change using climate data and a nationally representative survey of households in Mozambique, spanning the years 2002 to 2012. This study responds to calls in the literature for more empirical investigation regarding the role of climate on migration patterns, and how these patterns may differ according to climatic events (e.g. drought, flood or tropical cyclone). I presented during a session headed by one of the prominent names in human geography, which was an awesome opportunity to meet advancers of seminal theories in my field. I was also able to meet with the Human Dimensions of Global Change Specialty Group and talk in depth with people working on similar research topics, as well as in Mozambique. It proved to be an awesome opportunity to network! – Kelly Anderson

AAG 2016 Through the Student Lens continued....

While at AAG this year, I attended a number of talks that focused on marine and forest ecosystem management in Indonesia – these talks incorporated theory and practice, allowing me to make new connections with colleagues related to my research. I also attended a discussion session which addressed the integration of the topic of the Anthropocene into geography education through the use of both physical and human geography perspectives, which is very helpful to my work as an adjunct professor at Towson University. I presented a poster representing my dissertation work in Indonesia which assesses success factors for REDD+ there and applying those factors to three case study sites — Ashley Enrici

Photos: (left) GEOG PhD Student Ashely Enrici working the Department booth; (right) Xun Shi, Chair of AAG Health/Medical Geography Specialty Group, Yanjia Cao, and additional award recipient from the University of British Columbia.

During the 2016 AAG meeting, I presented my current research, “Geographic Variations in End-Stage Renal Disease and Kidney Transplants in the Midwestern United States: Disparities among racial groups and rural-urban areas,” in the paper session disease predication, through mapping in the symposium Geography and Urban Health. After attending several sessions at this conference, I concluded that the best talk was given by Harvey Miller, who discussed space-time prism and activity paths. The application of social media data in the field of GIScience is an exciting topic in my research field. This will contribute a great deal in the field of health geography by investigating innovative space-time theory. The right hand picture above is when I received the Melinda S. Meade Graduate Student Travel Award from the AAG Health and Medical Geography Specialty Group. — Yanjia Cao

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