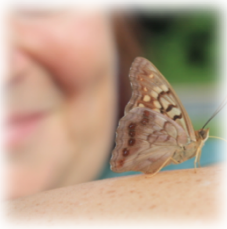



Earth Matters

vol.1, issue 1




Newsletter of the Department of Geography and Earth Sciences, University of North Carolina at Charlotte

UNC CHARLOTTE
College of Liberal Arts & Sciences

Message from the chair...

Greetings from the UNC Charlotte Department of Geography and Earth Sciences. I am delighted to be communicating to you through the Department's inaugural edition of its newsletter *Earth Matters*. *Earth Matters* is designed to provide a forum to highlight student and faculty achievements and communicate departmental news to students, alumni and friends of our Department. The name for the newsletter was selected by faculty, staff and students and was contributed by M.S. Earth Sciences student Sofia DiBari. The newsletter will be published twice a year with a spring and fall issue.

The 2014-15 academic year has been a busy and productive period for our Department's students, staff and faculty. During this past year the Department has launched two new degree programs, a Bachelor's of Arts in Environmental Studies and a Bachelor's of Science in Earth and Environmental Sciences and now offers six undergraduate degree programs that also include a Bachelor's of Arts and Bachelor's of Science in Geography, a Bachelor's of Science in Geology and a Bachelor's of Science in Meteorology. The Department is approaching 300 undergraduate majors and currently has a further 64 students enrolled in its three graduate degree programs.

Our Department is pleased to announce an exciting new study abroad summer course offering. Qingfang Wang and Wei-Ning Xiang will lead a group of UNC Charlotte undergraduate and graduate students to Shanghai, China to study firsthand the urbanization process in East Asia This program is designed collectively by our Department and the School of Ecological and Environmental Sciences (SEES) at East China Normal University (ECNU) in Shanghai, China and will be co-led by Lin Lin of ECNU. Our Department is planning to offer frequent study abroad opportunities for our students with the destination and course offerings changing regularly.

Our Department welcomed Casey Davenport, Valerie Reynolds, David Vinson, Elizabeth Delmelle and Patricia Fall as new faculty members.

Regrettably, our Department also lost two valued colleagues, Xingjian Liu who joined the Department of Urban Planning and Design, University of Hong Kong and John Bender who retired after 32 years of service to the Department. A retrospective of John's career appears later in this issue.

This has been an exciting year in the Department with many on and off campus "firsts". The Meteorology student group STORM organized and ran the first "WeatherFest" event and by all measures it was extremely successful with several hundred members of the public descending on the campus on a picture perfect spring day. The Department's graduate student organization GESGO launched the very successful Operation Sandwich, where student and faculty assembled and donated over 800 sandwiches to Charlotte's Urban Ministry. In addition to these firsts the Department really took flight (literally), with multiple weather balloon launches and a balloon mapping exercise of the campus performed by students in Elizabeth Delmelle's new "Spatial Thinking" course.

The Department held its annual Student Awards Banquet on Friday April 17 in the campus Gold Room. Scholarships that were awarded this year included the Ashton Memorial Scholarship, the Bunker Land Group Scholarship, the Will and Cara Harman Scholarship and the Dennis Lord Scholarship. It was a great evening where students, alumni and faculty were able to celebrate our student's achievements over the past year.

I would like to give special thanks to Dr. Eric Delmelle and Ph.D. candidate Danny Yonto for serving as co-editors in chief in the inaugural edition of *Earth Matters*.

On behalf of the faculty, staff and students in the Department of Geography and Earth Sciences, we welcome you and hope that you enjoy this first issue.

Craig J. Allan, Department Chair

What's new?

Project Mosaic

Project Mosaic is a new UNC Charlotte initiative launched in 2013. Its mission is to enhance social and behavioral science research at UNC Charlotte, following the model of Social Science Research Institutes that exist on the campus of many other institutions of higher learning in the United States. Supporting our mission, Project Mosaic provides an intellectual collaborative community that connects social science researchers together as well as with a broader community of scholars, including data scientists, natural scientists, and humanists.

Project Mosaic also fosters the creation of interdisciplinary and trans-disciplinary research teams in social and behavioral sciences. In addition, Project Mosaic provides research support to investigators in the areas of collaborative planning, development and design of research projects, research design, and analysis.

Core programs and activities of Project Mosaic include analytics workshops, analytics and methodology consulting services, research seminars open to faculty and graduate students, shared social science research facilities, seed grants and faculty research mentoring programs, a campus-wide lecture series, and much more.

As the initiative has been in existence for three semesters, Project Mosaic has reached hundreds of graduate students through its numerous workshops and consulting services. And with close to 400 faculty members from multiple colleges, Project Mosaic's strong community of social scientists continues to grow.

Project Mosaic is administratively a unit of the College of Liberal Arts &Sciences, but has close interactions with researchers in the College of Liberal Arts & Sciences, Belk College of Business, College of Health and Human Services, College of Education, and other social scientists on campus. Project Mosaic receives financial support from these colleges, as well as the Division of Academic Affairs and the Division of Research and Economic Development. The initiative is led by Professor Jean-Claude Thill, Knight Distinguished Professor of Public Policy in the Department of Geography and Earth Sciences.

Improved accessibility

Renovations of the two elevators took place in the summer of 2014. Residents of McEniry will now enjoy a smooth and hopefully uneventful ride to their destinations....

Picture credits: Patrick Jones and Adrian Jelley

Students' forum

Adventures in balloon mapping
(by Rashid Clifton & Kelly O'Connor)

As a student of Geography, you seem to become acutely aware of all the challenges that await you in the field of GIS very early on. You heed the warnings of dismay from your esteemed faculty and if you have ever been so lucky to explore the dark depths of McEniry, you may have even been witness to the living monuments of this warning – graduate students. The dismay becomes permanently encapsulated upon their faces as they adorn the fourth floor halls.

Adam Griffith and Rashid Clifton setting up the experiment. Picture credit: Elizabeth Delmelle

As a class, our balloon mapping expedition faced no shortage of these dismal challenges – they ranged from dead batteries, **relief displacement**, trees, all the way to bureaucratic funding issues. With the support of a strong Department behind us and the expert balloon navigation skills of our teachers, Dr. Elizabeth Delmelle and her trusty assistant, Mr. Adam Griffith, we were able to easily overcome these obstacles and learn a bit along the way.

While discussing the various kinds of **remote sensing** technology in our Spatial Thinking class we learned that balloon mapping is a sensible solution to providing research and educational opportunities to communities in which there are cost-prohibitive barriers. Not only are the tools themselves low-cost, but so is the technology! We were able to witness **crowdsourcing** at its finest when Mr. Griffith introduced us to *PublicLab*. This a free **open source** platform that is primarily used for **citizen science**. Even as novice geographers the technology was very easy to use.

Methodology:
Our experiment began using two recycled Coke bottles, innumerable amounts of tape, a1,000 foot spool of string, helium, one standard digital camera, one ginormous weather balloon and 23 fresh-faced Spatial Thinkers. In order to take our aerial survey it was crucial that the balloon was properly set up to cradle the camera, so that's where the mixed ingredients came into play. Additionally, we also needed to program the camera to take constant photographs, so we simply rigged the shutter. The setup was straight-forward and we encountered no difficulties once we were in the field.

Experience:
Using a weather balloon to create a map of campus was quite the exciting experience. As we began to inflate the balloon, the class watched in awe as the rubber stretched to over 5 times its normal size. Holding onto the balloon was a challenge; I felt like I would float away if I weighed 10 pounds less. Launching the balloon was possibly the most fascinating part of the whole process. As we let go of the string the balloon took off, reaching for the top of the atmosphere until the string brought it to a halt at an altitude 1000 feet.

Students' forum

Walking around campus took a lot of concentration and planning. There were a variety of factors to take into account, such as wind at ground level, wind at the balloon's altitude, trees, and buildings. Having the balloon collide with an unsuspecting tree branch would have been disastrous.

View from the balloon. Picture credit: Adam Griffith

Mapping with a weather balloon on campus gained a lot of attraction. Nearly every student who passed by us stared at the sky with curiosity. It was a nice change to see students looking up and around, instead of hanging their heads low, engulfed by the social media world on their smartphones. That just goes to show that geography has the power to shine through everyone's iCloud!

What we learned:

With Elizabeth. Delmelle's eternal positivity cheering us on, we were able to sort through the thousands of images and individually choose the best ones for our mapping. In class, we learned about how **relief displacement** was at its greatest as we moved further away from our **nadir**~ so layering for accuracy around the edges allowed us to minimize the displacement. Because we were layering our new images over the existing ones on MapKnitter, we were instructed to resist the temptation to align from the tops of the buildings. We could avoid this practice by remembering the "falling" effect as the buildings leaned away from the **principal point**. Instead, to reduce this depression we used features on the ground to **georeference.**

All in all, our balloon mapping venture was tons of fun. It was a great experiment that really incorporated all of the concepts we had been learning, from technological semantics to some of the bigger ideas ~ like the impact making geography and geospatial technology **ubiquitous** and accessible with simple balloons could have on bettering the world.

View from the balloon over the Prospector in (a) and Belk Tower in (b). Picture credit: Adam Griffith

Students' forum

Our students presented about...

Tag cloud generated from 2014 most representative presentation and publication abstracts and keywords, as provided by our graduate students. . Source: Daniel Yonto. Tag cloud generated in wordle.net

Extracting patterns of health-related tweets
(by Ben Stoltz, Bachelor's of Science, Geography)

At the end of the Fall 2014 semester Eric Delmelle and I expressed mutual interest in pursuing research on Twitter and Health GIS.

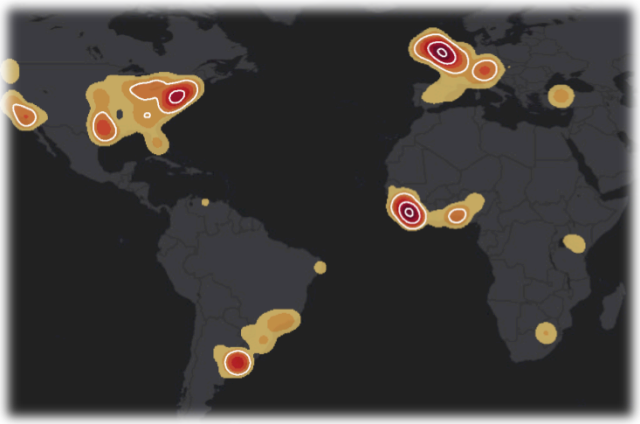
From that we decided to research the most optimal ways to access, store, process, and visualize Tweets about infectious diseases in both the spatial and temporal scale.

I have been predominantly focused on the technical implementation; accessing tweets via streaming and search api's, storing them in a Mongo database, and extracting elements of the tweet object.

Our next steps are to extract locational information from non geocoded tweets and determine the most optimal method to visualize many thousands of twitter points.

I am very glad that Eric Delmelle and I have worked on this project as it has really exposed me to new technologies and new ways of thinking with relation to programming and Health GIS.

As an example, the map below shows the density of Ebola-related tweets over Africa, Europe, North, Central and South America, from March 19 to April 1 2015.



Heat map of tweets with the word "Ebola" in them.

Students' forum

Frog mating patterns
(by Addie Boucher, M.S. Earth Sciences)

My research focuses on anuran (frog and toad) breeding in the city and in the surrounding rural areas of Charlotte. One aspect of my research will examine if the urban heat island is affecting anuran breeding, as it can increase temperatures and relative humidity within the city allowing for anuran breeding to commence earlier than anuran breeding in the rural areas.

Another aspect of my research will focus on habitat quality at stormwater control ponds and remnant ponds to link habitat characteristics to anuran species richness and abundance. This spring I will be conducting six anuran call surveys and documenting habitat quality at 67 ponds to further understand how anuran species richness and abundance may be linked to the urban heat island, habitat quality, or both.

Addie holding an American Toad during her first anuran call survey this spring.

In this issue, we feature three students' research

- Ben Stoltz, an undergraduate student in Geography,
- Addie Boucher, a Master's student in Earth Sciences
- Angelique Hjarding, Ph.D. student in Geography

We are looking forward to showcasing your research in the next issue. Please contact ges@uncc.edu to be included!

The butterfly highway project
(by Angelique Hjarding, Ph.D. student)

Angelique is a third year doctoral student in Geography and is a part of the Charlotte Action Research Project (CHARP) under the supervision of Janni Sorensen. Her dissertation research studies the distribution of urban butterflies and the effects of urbanization on butterfly populations in Charlotte. As a part of her research she has created a project called the Butterfly Highway that is a community based conservation project in low income minority urban residential neighborhoods in Charlotte. Through a small grant from the National Fish and Wildlife Foundation and Bank of America she is able to offer butterfly gardens to residents at no cost as a way to improve the existing green infrastructure in these areas. In exchange, residents volunteer to participate in a community based citizen science butterfly monitoring project and allow Angel and other students access to their home gardens to observe butterfly visits. Collectively the gardens will make up a "Butterfly Highway" through seven neighborhoods in Charlotte.

Angelique with a Tawny Emperor. Washington Heights neighborhood in Charlotte. Picture credit: Gaston Abel

In addition to the conservation and beautification outcomes for neighborhoods, this project is also serving as a neighborhood organizing catalyst in neighborhoods that have identified that as a need. If you are interested in learning more about Angel's research or would like to volunteer, there are numerous opportunities to participate.

60 seconds with an alumnus

by Daniel Yonto and Eric Delmelle

Paul McDaniel

What is your hometown?
Hoover, Alabama (Suburb of Birmingham, AL)

What degrees do you hold?
- Bachelor's of Science in Geography from Samford University
- Master's of Science in Geography from University of Tennessee
- Master's of Arts in Higher Education Leadership from University of Alabama at Birmingham
- Ph.D. in Geography and Urban Regional Analysis from UNC Charlotte

What is your current job description?
I am currently a Research Fellow at the American Immigration Council in Washington, DC and contribute to research and policy analysis of immigrant integration and receptivity at the national, state, and local levels. I also look at the growing number of places that are being more receptive to immigrants and refugees, and the policies and strategies they're implementing to make these areas a more receptive environment.

What are your fondest memories of our department?
One that immediately comes to mind is the geography club and honor society that formed a team to go to the NC world geography bowl held at UNC Greensboro. A couple of years I led the team, and we won the state championship in 2011.

Research
I worked on several community-based research projects with the Mecklenburg Area Partnership for Primary-care Research (MAPPR), Levine Museum of the New South, Charlotte-Mecklenburg Schools, and Crossroads Charlotte. I have also worked on reports and presentations about immigrant entrepreneurship, immigrant settlement and integration in new immigrant gateways and destinations, immigrant access to education and healthcare, and community receptivity.

Skills learned in Charlotte used in current position
The research and service I was involved with utilized mixed method research. Cultivating those skills, along with the public speaking and community engagement experiences gained, has helped inform how I conduct and analyze research on immigration policy.

Fast facts about Paul

- Works on comprehensive immigration reform
- Has had several meetings at the White House
- Has contributed to House and Senate Hearings on immigration policy

Words of wisdom for students in our department
I would suggest taking advantage of opportunities to participate in the wide variety of activities that happen at UNC Charlotte. These include different types of research opportunities, teaching opportunities, as well as service experiences both inside the department and in the larger UNC Charlotte community. Doing so can help cultivate a well-rounded skillset of depth and breadth in a student.

What about Charlotte are you missing?
The food....it's hard to find good Southern food in Washington, DC because they try to serve it gourmet style, but that's not that authentic. Also, it's hard to find good BBQ, and it's a little too cold here.

Faculty corner

by Missy Eppes and John Diemer

John Bender
(by Missy Eppes and John Diemer)

Professor John Bender retired at the end of 2014 after a long and illustrious career in our department. We are pleased to bring to you this article celebrating the career and life of our friend and colleague in this first edition of *Earth Matters*.

Born in 1948 on Long Island, John earned a Bachelor's of Science. degree in Geology in 1970 from the State University of New York at New Paltz where he met his wife Kathy. He then went on to earn an Master's of Science. degree in Geochemistry in 1972 at Pennsylvania State University. After graduating from Penn State, John and Kathy moved to Rock Hill, South Carolina, where John took a job as instructor of geology and chemistry at Winthrop University and taught a wide array of courses in those fields from 1972–1975. In 1975 John enrolled in the Ph.D. program in Geochemistry at the State University of New York at Stony Brook where he worked under the supervision of Gil Hanson. He earned his Ph.D. in 1980 having investigated large-scale liquid immiscibility (a condition where two liquids of different compositions co-exist in equilibrium with each other) involving granodiorite and diorite magmas of the Cortland, NY complex. After completing his Ph.D., John then moved to Albany, New York where he had joint post-doctoral positions at Renesselaer Polytechnic Institute and SUNY Albany from 1980–1982 and where he first met his future colleague, Andy Bobyarchick! In 1982, John returned to the Carolinas and joined our department. John quickly rose through the ranks earning tenure in 1987 and was promoted to Full Professor in 1992. Along the way, John and Kathy raised two children, their daughter Katie and son Tim (not to mention Corgies and championship roses thrown in), and just in time for retirement, John became a GrandBender with a new grandson!

During the Charlotte years, John established a robust teaching program that included classic and classically difficult! courses in *Physical Geology*, *Oceanography*, *Mineralogy*, *Optical Mineralogy*, *Igneous and Metamorphic Petrology*, and *Geochemistry*. Despite the rigorous and complex nature of these subjects, John was a favorite and demanding instructor in those classes. One student notes: "His humor kept everyone on their toes and proved to be a good motivator to never look foolish in class". John also provided many of the students opportunities to participate in his research and teaching. John likewise supervised the work of several Master's students who have undertaken further graduate work at the Ph.D. level or found gainful employment in the mining and environmental geology fields. One of his students wrote, "He regularly checked in on me to make sure I was happy with what I was researching or asked how I was doing outside of school". John's love of his students has always been evident to us all.

"His humor kept everyone on their toes and proved to be a good motivator to never look foolish in class"

John's research program at UNC Charlotte was as equally robust as his teaching, with funding from the National Science Foundation and other prestigious sources to investigate the origin and evolution of mid-ocean ridge basalts. John made significant contributions to these fundamental research questions with a who's-who list of colleagues including Charlie Langmuir, Gil Hanson, Ron Batiza, Emily Klein, Bill Ryan, and Mike Perfit. These scientists are among the best known in the field of mid-ocean ridge petrology. In addition to serving on numerous NSF, Joint Oceanographic Institutions (JOI), and Ocean

Continued

Faculty corner

Drilling Program (ODP) panels (the groups that make the decisions about what research gets funded by these national programs), John also served on several international panels including COSOD II, JOIDES, and the ODP InterRIDGE Liason Group. His input was highly sought after and valued in the process of reviewing grant proposals and awarding funding to oceanographic research programs focused on the origin of the sea floor. John was selected as the chief scientist on several oceanographic expeditions during the 1980s and 1990s to sample and characterize the East Pacific Rise (Imagine boats out in remote seas crowded with instruments and scientists; aye aye Captain Bender!). John was an author or co-author of more than 40 refereed papers and conference abstracts. Also, over the course of his career, John brought in more than $1 million in grants and contracts to UNC Charlotte. One of his funded projects to dredge glass coated rocks from the East Pacific Rise resulted in an article with the cover photo for NATURE in 1992.

John served the university in many capacities. He served as the Earth Sciences undergraduate coordinator from 2000–2006 while also serving as the M.S. in Earth Sciences coordinator helping students navigate the University system and matriculate through their degrees. From 2006–2007 John served as the Associate Chair where he oversaw the laborious task of renovating McEniry and its laboratories. John served many times on the Department Review Committee and coordinated the searches for many faculty positions; these are some of the most time-consuming service positions in a University Department. At the College level, John was elected multiple times to the College of Liberal Arts & Sciences Review Committee and the Reassignment of Duties Committee. He was also appointed to several departmental chair search committees and tenure revision task forces. At the University level, his counsel was equally sought out and he served on competitive grants committees, teaching award committees, faculty grievance committees and also on the Chancellor's Advisory Council on Intercollegiate Athletics. John also was one of the key members of the committees that established both the M.S. Earth Sciences and the Infrastructure and Environmental Systems Ph.D. programs, and he served as one of the UNC Charlotte representatives to the UNC System Faculty Assembly.

Overall, John's legacy to the University, our department, and most-importantly to his students is incalculable. As one student put it, "I know that I can speak for the many that we are all honored to have studied underneath him". He will be sorely missed. We wish him a retirement that is equally as long and enriching as his career, wherever it may take him! Congratulations John!

Faculty and staff members in front of our department during a beautiful day in January. Picture credit: Patrick Jones

Community engagement

Operation Sandwich
(by Daniel Yonto, Ph.D. student)

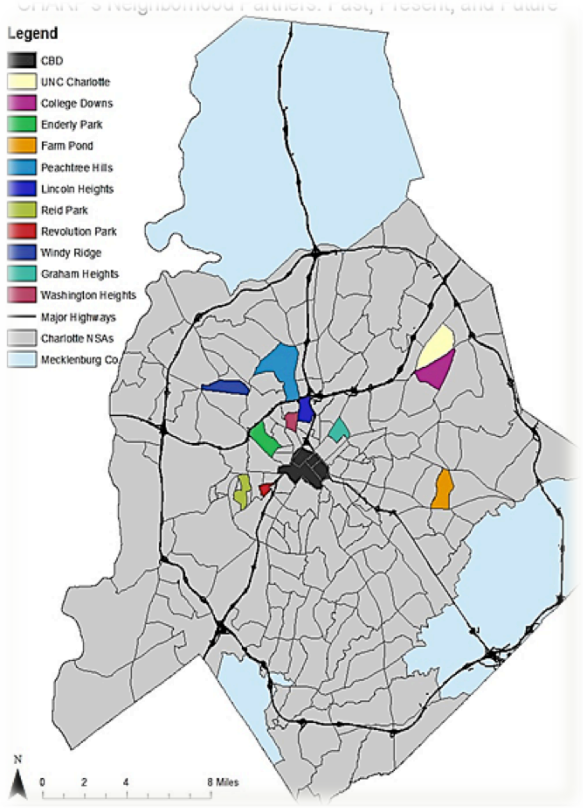
On December 5, 2014 **Operation Sandwich** was a GO! The objective: make 800 sandwiches for the Urban Ministry center to help the homeless living in Charlotte. The supplies: 75 loaves of bread, 7 lbs. of turkey, 7 lbs. roast beef, 7 lbs. ham, 7 lbs. of bologna, 15 lbs. of cheese … and of course lots of PB&J. Did we reach our goal? You better believe it. The Geography and Earth Sciences Graduate Student Organization (GESGO), under the leadership of Daniel Yonto and Sophia Di Bari, supplied all makings for the sandwiches and expertly managed their volunteers so that over 800 sandwiches were delivered to the Urban Ministry. Mission Accomplished.

Students and faculty actively engaged during Operation Sandwich. Pictures credit: Daniel Yonto.

Community engagement

The Charlotte Action Research Project
(by Melissa Currie, Ph.D.)

The Charlotte Action Research Project (CHARP) and Janni Sorensen have been partnering UNC Charlotte students with local marginalized communities since 2008. CHARP works toward a larger agenda of social justice to enable self-advocacy within partner neighborhoods. CHARP has received national recognition and awards for several student-led projects, including more than $165,000 in grants from a variety of sources. Examples include community cleanups and beautification, newsletters, youth outreach, oral history projects, asset and foreclosure mapping, a Green Initiative, and holiday balls.



CHARP neighborhood partners.

Major projects include a new Kaboom! playground, student-designed plans for a long-awaited neighborhood park adopted by the County, a Women's Safety Audit (where students and residents walked a neighborhood to map places deemed unsafe), and future plans to encourage butterfly migration through Charlotte via a "Butterfly Highway (read article by Angelique Hjarding, this issue)." Published journal articles and several past and current master's and doctoral research projects have been successfully garnered through participation in CHARP.

CHARP researchers, students, and residents review participatory mapping exercises and data gathered during the Greater Enderly Park Women's Safety Audit. Photo: Melissa Currie, 2014.

WeatherFest, Saturday March 19
(by Richard Matthews, B.S. Meteorology)

Over 500 people are estimated to have attended Charlotte WeatherFest on March 21st. The event featured 5 local TV stations, NOAA, the NWS, Charlotte Fire/EM, UNC Charlotte Police, local HAM Radio, HurricaneTrack.com and Mecklenburg StormWater. Kids enjoyed building weather related arts and crafts and doing their best TV meteorologist impression on a green screen.

Community engagement

Faculty presented lectures on topics from hurricanes to climate change. At the end of the event, students and faculty joined together to use the meteorology program's new weather balloon sounding system and launch a weather balloon. The data was then shown in real time, letting visitors learn how we gather weather data!

(a) Terry Shirley, meteorology faculty discusses with kids what a weather balloon is. (b) Event attendees were able to view live radar and satellite data. (c) Kids enjoy hands on take home activities. (d) Steve Udelson (WSOC) and Lyndsay Tapases (WBTV) talk to a young fan. (e) Mark Sudduth of HurricaneTrack.com brought his hurricane intercept vehicle. (f) Visitors learned about how a tornado forms and just how big hail can get. Picture credits: (a)-(d): Lynn Roberson, College Communication Office, CLAS; (e) – (f): Dr. Casey Davenport.

Spring Events and Contact Information

Friday April 17: Student Awards Banquet in the campus Gold Room, Prospector from 5.30 to 8pm.

Tuesday April 21 – Saturday April 25: Annual Meeting of the Association of American Geographers, Chicago, IL.

Friday April 24 from 12pm - 1pm, McEniry 401. Meet the new GESCO officers:

Michael Desjardins, President
Addie Boucher, VP
Ryan Hubler, Treasurer
Allie Shoffner, Secretary

Sunday April 26: Science and Technology Expo. Union Plaza from 12 to 4pm.

Friday May 8th: Students departed for East China Normal University

Saturday May 9: Commencement (10 am)

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