

Welcome to UTK Geography's
Inaugural Research Symposium:

Mapping Outside the Lines:
*Geography as a Nexus for
Interdisciplinary and Collaborative
Research*



Many thanks to our generous sponsors:

UT's Ready for the World Initiative, College of Arts and Sciences, The Graduate School, Gamma Theta Upsilon International Geographic Honor Society, the Departments of Geography, Civil Engineering, Sociology, Political Science, History, Microbiology, Religious Studies, and The School of Information Sciences



Welcome to the Department of Geography at the University of Tennessee. Our department offers B.A., M.S., and Ph.D. degrees in geography. Our faculty and students, including undergraduate students, conduct research in Tennessee, the southeastern United States, and across the globe. The Department is a lively, talented, and congenial community devoted to nurturing students, serving their intellectual passions and vocational goals, and providing them the best learning environment possible—all while advancing the frontiers of geographic knowledge.

Students work alongside award-winning and renowned scholar-teachers who place great value on field work, international travel and scholarship, mapping and location analysis, the natural environment and sustainable development, state of the art technology and data analysis (quantitative and qualitative), community engagement, responsible planning, and social justice. Our faculty, students, and staff hail from a diversity of backgrounds, cultures and world regions, and we welcome prospective students from all walks of life and disciplines. After you check out our campus, consider visiting the Department in the Burchfiel Geography Building, built for us in 2000 and centrally located on campus.

Dear Conference Participants and Guests,

The organizing committee warmly welcomes you to UT Geography's inaugural research symposium. Our committee, composed of a team of undergraduate students, graduate students, and faculty advisors, is thrilled to share this weekend with you. What began over a year ago as an idea for us to share our research with each other has become an event featuring students from across the UT community and the region. We have worked hard to make this a weekend to remember!

Please take a look through the program and see what we have in store for you. We've also included information about where to eat and play in Knoxville, so we hope you'll take some time to enjoy our great little city.

Thanks so much to our cosponsors, listed on the cover, for your generous support. Also, last, but certainly not least, thank you to our office staff, Pamela Sharpe, Tracy Branch, and Norma Galyon, for going beyond the call of duty to help make this weekend happen. This has truly been a team effort, and we are lucky to be part of such a supportive university community.

Best Wishes,

The Geography Symposium Committee

Student Leaders:

Matthew Kerr, Co-Chair

Melanie Barron, Co-Chair

Ruth Bowling, Human Geography Coordinator

Savannah Collins, Physical Geography Coordinator

Vi Tran, GIS Coordinator

Julie McKnight, Undergraduate Participation Coordinator

Dakota Anderson, Undergraduate Representative

Michael Schilling, Undergraduate Representative

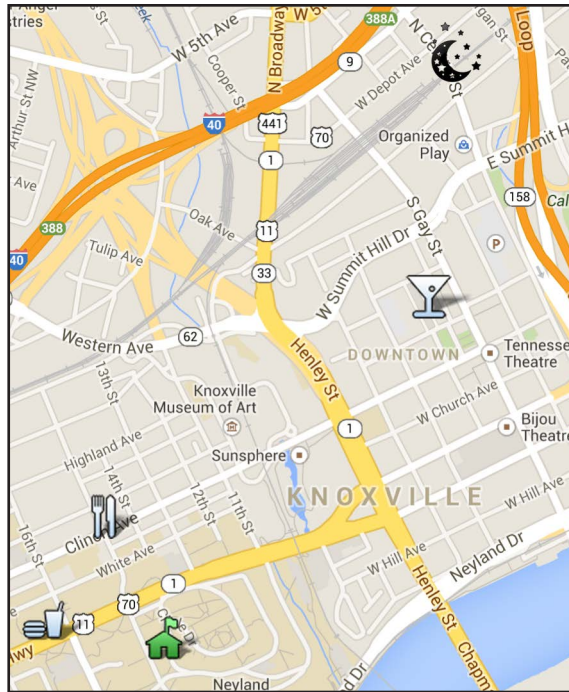
Faculty Advisors:






Dr. Bruce Ralston

Dr. Liem Tran

Dr. Micheline van Riemsdijk

Welcome to Knoxville, Tennessee!



-  **Burchfiel Geography Building**
1000 Philip Fulmer Way
-  **Chaiyo Thai & Sushi Bar**
Our department's go-to lunch destination. Thai and sushi. 601 James Agee Street
-  **Market Square**
Knoxville's boutique dining and shopping district. knoxvillemarketsquare.com
-  **Old City**
Knoxville's Night Life district. At the intersection of E Jackson Ave. and N Central St. Enjoy dinner at department favorites Crown and Goose and Jig & Reel.
-  **"The Strip"**
Restaurants, bars, and retail, including: Chipotle Mexican Grill, Noodles & Company, Firehouse Subs, Wendy's, McDonald's, and more...just walk west down Cumberland Ave.

Welcome!

Schedule:

All events are in the University Center unless otherwise specified

Friday, February 21st

Undergraduate Posters on Display All Day in UC 224

9:00-9:45	Shiloh Room	Registration, Opening Remarks
10:00-11:00	UC 221	GIS I
11:10-12:00	UC 225	Physical I
12:00-1:00	Lunch @ Smokey's, downstairs in the UC	
1:00-1:50	UC 221	Human I
2:00-2:50	UC 225	Human II
3:00-3:50	UC 221	Physical II
4:00-5:00	UC 224	Poster Session Reception
5:00-6:00	BGB 101	Undergrad Quiz Bowl Competition

Saturday, February 22nd

8:30-10:00	UC 221	GIS II
	UC 224	People & Environment
10:10-11:05	UC 224	Physical III
	UC 221	Human III
11:15-12:30	UC Shiloh	Keynote Address
12:30-1:00	UC Shiloh	Undergraduate Awards
		Closing Remarks

Friday, February 21st

9:00-9:45 Registration/Opening

Undergraduate Posters on Display all Day in UC 224:

“Stable Isotopic Signatures in Charcoal from a Costa Rican Sediment Core.”

By: Sarah Bleakney, Department of Geography, University of Tennessee.

“Recruitment of Foreign-born Engineers.”

By: Gareth Butler, Department of Geography, University of Tennessee.

“Tourism in Africa.”

By: Jerry Evans, Department of Geography, University of Tennessee.

“The Influence of Climate and Forest Disturbance on Hemlock Growth in Southwestern West Virginia.”

By: Joshua Gelinis and Nate Lawrence, Concord University.

“Most Innovative Cities In the United States.”

By: Michael Schilling, Department of Geography, University of Tennessee.

“A Cartographic Overview of the People's Republic of China.”

By: Anders Vaughn, Department of Geography, University of Tennessee.

“Traveling By Car During the Jim Crow Era.”

By: Kortney Williams, Department of Geography, University of Tennessee.

10:00-11:00 GIS I (UC 221):

“Studying User Behavior and Safety on Electric Bicycles based on GPS Tracking Data.”

By: Brian Casey Langford and Jiaoli Chen, Department of Civil and Environmental Engineering and Department of Geography, University of Tennessee

“A Space-Time Prism Approach for Scheduling Daily Activities in Real Situations.”

By: Jiaoli Chen, Department of Geography, University of Tennessee

“A home-based approach to studying human mobility patterns using mobile phone location records.”

By: Yang Xu, Shih-Lung Shaw, Ziliang Zhao, Department of Geography, University of Tennessee

“Measuring Spatial Health Disparity in a GIS Environment: A Case Study of Hillsborough County, Florida, USA.”

By: Huairan Ye and Hyun Kim, Department of Geography, University of Tennessee

11:10-12:00 Physical I (UC 225):

“Detecting Tropical Cyclone Signals in Tree-Growth Responses of Longleaf Pine, Lake Louise, Georgia, USA.”

By: Savannah Collins and Henri Grissino-Mayer, Department of Geography, University of Tennessee

“Dendrogeomorphic Analysis of Debris Slides on Mt. LeConte, Great Smoky Mountain National Park, Tennessee, USA.”

By: Maegen Rochner, Department of Geography, University of Tennessee

“A Dendrochronological Approach to Biogeography in the Southeastern USA.”

By: Henri Grissino-Mayer, Department of Geography, University of Tennessee

12:00-1:00 Lunch Break

Enjoy your lunch coupon at Smokey's, downstairs in the University Center!

1:00-1:50 Human I (UC 221):

“Creating Place, Building Community: A Case Study of the Antagonist Art Movement.”

By: Ruth Bowling, Department of Geography, University of Tennessee

“‘The Boston I Knew is Lying on the Ground:’ Reinterpreting Boston Landscapes Through Song.”

By: Tyler Sonnichsen, Department of Geography, University of Tennessee

“Landscape and Soundscape in Olivier Messian’s Des canyons aux étoiles . . .”

By: Ryan Taussig, Department of Music, University of Tennessee

2:00-2:50 Human II (UC 225):

“An Anthropological Approach to Place and Space: How Identity and Politics are Intertwined with the Physical Landscape in Northern Uganda.”

By: Adrienne Kembel and Amanda J. Reinke, Department of Anthropology, University of Tennessee

“The Textual Politics of Alabama’s Historical Markers: Slavery, Emancipation, and Civil Rights.”

By: Matthew Cook, Department of Geography, University of Tennessee

“Mapping (with) Communities: GIS and Storytelling in Black Belt Tourism.”

By: Tom Torres, University of North Georgia

3:00-4:00 Physical II (UC 221):

“A Primer on the Use of Remote Sensing to Assess Carbon Fluxes at Local to Global Spatial Scales.”

By: Robert Washington-Allen, Department of Geography, University of Tennessee

“Examining Longitudinal Patterns: A Geographic Perspective on River Systems Analysis.”

By: Derek J. Martin, Department of Geography, University of Tennessee

Carol P. Harden, Department of Geography, University of Tennessee, Robert T. Pavlowsky, Ozarks Environmental and Water Resources Institute, Missouri State University

“Spatiotemporal Clustering of Extreme Hurricane Wind Events Impacting US Coastal Cities.”

By: Linda Sylvester, Department of Geography, University of Tennessee

“Using Synthetic Tropical Cyclones to Characterize Extreme Hurricanes for Charleston, South Carolina.”

By: Kelsey N. Ellis, Department of Geography, University of Tennessee, Jill C. Trepanier, Department of Geography and Anthropology, Louisiana State University, Robert E. Hodges, Department of Geography, Florida State University

4:00-5:00 Poster Session Reception (UC 224)

Come and view the undergraduate poster competition submissions with the judges and enjoy refreshments!

5:00-6:00 Quiz Bowl Competition (BGB 101)**

Come see undergraduate students compete in a geography bowl match!

**This is located in the Burchfiel Geography Building

Tonight, enjoy Knoxville! Please see page 4 for a listing of nearby restaurants and attractions.

Saturday, February 22nd

8:30-10:00 *Concurrent Sessions*

GIS II (UC 221):

“The Effects of Multispeed Regulation on the Cannabis Market: Lessons from Crowdsourced Data.”

By: Ephraim Love, Department of Geography, University of Tennessee

“Progresses and Challenges of Regional Integrated Environmental Assessment in the US.”

By: Liem Tran, Department of Geography, University of Tennessee

“Careers and Collaborations: Partnerships in Archives, Data Centers, and Libraries.”

By: Wade Bishop, School of Information Sciences, University of Tennessee

“Putting Place in History.”

By: April Akins, School of Information Sciences, University of Tennessee

“Geocoding in Geographic Information Retrieval Systems.”

By: Tanner Jessel, School of Information Sciences, University of Tennessee

People & Environment (UC 224):

“The Political Ecology of Coal Disasters and Post-Coal Possibilities in the Appalachian South.”

By: Erin Eldridge, University of Tennessee

“Mixed Methods Techniques for Analyzing Water Quantity Perceptions in Western North Carolina.”

By: Courtney Cooper, Department of Geography and Planning, Appalachian State University

“Hidden Effects of Environmental Restoration: The Impact of ‘Newcomers’ on the Access and Allocation of Water in Widou Thiengoly, Senegal.”

By: Anna Alsobrook, Department of Geography, University of Tennessee

“Who Cares About Climate Change? The Challenges of an ‘Economically Unviable’ People.”

By: Kathleen Ernst, Oak Ridge National Laboratory

“Institutional Actors’ Perceptions of Climate Change and their Implications for Decision-Making and Equity: A Case Study in Hampston Roads, Virginia, USA.”

By: Jamie Haverkamp, Department of Geography, University of Tennessee

10:10-11:05 *Concurrent Sessions*

Physical III (UC 224):

“Quartz Melt Structures in European Coversands may Support Younger Dryas Extraterrestrial Impact Hypothesis.”

By: Joanne Ballard, Department of Geography, University of Tennessee

“The Relationship between Organic Matter and Organic Carbon in Lake Sediments from Laguna Santa Elena, Costa Rica: A Preliminary Assessment of the Potential as a Paleoenvironmental Proxy.”

By: Matthew T. Kerr, Sally P. Horn, and Chad S. Lane, Department of Geography, University of Tennessee.

“Pollen, Spores, and Charcoal in the Surface Sediments of a Glacial Lake.”

By: Sally P. Horn, Department of Geography, University of Tennessee

Human III (UC 221)

“Governing Student Migration: An Investigation of the Varied Investors in a Norwegian Scholarship Program for Development Assistance.”

By: Scott Basford, Department of Geography, University of Tennessee

“Attracting the Best and Brightest: Perspectives of HR Managers and Foreign-Born Engineers in Norway’s Oil and Gas Industry.”

By: Micheline van Riemsdijk, Department of Geography, University of Tennessee

“Toeing the Line: Precarious Employment in Tennessee.”

By: Kevin Durand, Department of Sociology, University of Tennessee

Abstracts are listed according to the first authors' last names.

April Akins, School of Information Sciences, University of Tennessee. "Putting Place in History." Introducing Geographic Information Systems (GIS) to archives, museums and other historical collections increases the user experience. Archives, museums, and library special collections across the United States would benefit from the introduction of GIS in their collections. "Some of today's historical GIS projects are the first scholarly efforts to map important historical events or to capture and explore the geographical information contained in a major primary source" (Knowles, 2008, p. 18). This paper will present an overview of GIS and archives; what can be done with the combination of Geographic Information Systems in archives, museums and other historical collections; how archives are currently using GIS including examples of historical GIS projects; challenges this type of projects face; and the implications this brings to GIS professionals.

Anna Alsobrook, Department of Geography, University of Tennessee. "Hidden Effects of Environmental Restoration: The Impact of 'Newcomers' on the Access and Allocation of Water in Widou Thiengoly, Senegal." The north-central region of Senegal is home to the Great Green Wall (GGW)— a reforestation project aimed at restoring decades-old, degraded land conditions. Its presence on the ground has changed the local landscape, as well as altered the institutions governing the access and allocation of water. Using fieldwork experiences, semi-structured interviews, and personal observations, this paper researches how the presence of the GGW has altered village level dynamics in terms of water resources, specifically in the village of Widou Thiengoly, Senegal. It compares these changes with the historical, cultural institutions that once framed water access and allocation decisions, and it researches how these changes fall in line within the current developmental framework. Results show that GGW-influenced changes to the water system have created a paradoxical environment

**11:15-12:30 Keynote Address: Dr. William Moseley
 UC Shiloh Room**



**The Causes and Consequences
 of the 2008 Global Food Crisis:
 Neoliberal Policy Reform and
 Food Security in West Africa**

High food prices in 2007 and 2008 touched off food riots around the world, with urban West Africa arguably suffering more of these disturbances than any other world region. This paper seeks to understand this crisis by, initially, exploring the impacts of the first Green Revolution and neoliberal policy reform on the global food system. On the regional scale, it then examines the rice sectors of The Gambia, Côte d'Ivoire and Mali as well as cotton and its relationship to sorghum production in Mali. While market reforms were intended to improve food production in all three of these countries, the net result was an increasing reliance on imported rice. This import dependence exposed the vulnerability of the urban populations in The Gambia and Côte d'Ivoire became in 2007-2008 when world prices for rice spiked. Urban Mali was spared the worst of this crisis because the country produced more of its own rice and the poorest consumers shifted from rice to sorghum, a grain whose production increased steeply as cotton production collapsed. The findings are based on household and market surveys as well as an analysis of national level production data.

**12:30-1:00 Undergraduate Awards, Closing Remarks
 UC Shiloh Room**

with competing developmental goals. The aim to restore ecosystem productivity and climatic resilience is inherently decreasing sustainable access to water—an explicit component of both the UN Millennium Development Goals (MDG) and Senegal’s Poverty Reduction Strategy Paper (PSRP).

Joanne Ballard, Department of Geography, University of Tennessee. “Quartz Melt Structures in European Coversands may Support Younger Dryas Extraterrestrial Impact Hypothesis.” The Usselo horizons in The Netherlands and Belgium are typically charcoal-rich, late-glacial strata in the coversands, underlain by bleached-looking sand. Samples from 3 geographic locations in these countries were collected in 2011, and assessed with light microscopy as a first step in characterizing the spatial nature of a hypothesized extraterrestrial event (Firestone et al 2007). Sediment samples from Lommel, Belgium revealed probable surficial melt structures on quartz grains; quartz “needles”; fused quartz grains; melt glass; and abundant, well-rounded, black micrograins. Temperatures around 1600 degrees C are required to melt quartz. Some of these melt features were found in quartz grains in a dark brown laminated section, which indicates that the melting occurred in situ and that these are not allochthonous detrital grains. This site is estimated to be Younger Dryas in age. Thin section analysis of a very charcoal rich Usselo horizon at a fourth site, Ossendrecht, The Netherlands, revealed highly fractured quartz grains with evidence of possible microimpactors into semisolid quartz that was rapidly quenched. ESEM analysis on the Ossendrecht samples showed possible flowlines in quartz, and confirmed fused quartz grains. I explore the possibilities for the origin of these deposits: extraterrestrial, wildfire-driven, or volcanic in nature.

Scott Basford, Department of Geography, University of Tennessee. “Governing Student Migration: An Investigation of the Varied Investors in a Norwegian Scholarship Program for Development Assistance.” This paper addresses a call to acknowledge the varied actors that invest in international student migration. It does

so within the context of the Norwegian higher education system by investigating the governance of a scholarship scheme conceptualized as a form of development aid. Initially, the recruitment of international students was conducted primarily for humanitarian or political reasons. More recently, economic rationales have become dominant. While most developed countries derive large sums of money from international students, Norway offers foreigners free tuition. Norway also funds at least four scholarship programs for students from outside the developed world to help defray its high cost of living. One such initiative, the Quota Scheme, is predicated on the condition that students return to their home countries upon completing their studies. Nevertheless, only about half of its recipients honor this stipulation. I use 26 interviews with stakeholders at multiple scales of involvement to explore how students’ migration motivations are shaped by the governance of the network of investors in the Quota Scheme. Most importantly, I highlight that actor intentions and material realities conflict as often as they coalesce.

Wade Bishop, School of Information Sciences, University of Tennessee. “Careers and Collaborations: Partnerships in Archives, Data Centers, and Libraries.” This paper presents the Geographic Information Librarianship (GIL) project funded by the Laura Bush 21st Century Librarian Program grant via the Institute of Museum and Library Services (IMLS). The project bolstered data curation education of information professionals dealing with the varied resources generated by geospatial tools. The recent and rapid progression of technology has forced librarians, archivists, and data center information professionals to both face changes in the format and types of information objects they work with, as well as the related legacy issues of past platforms to collect, view, and create geographic information for GIS users. The world of print maps remains, but now many digital cartographic resources such as the geospatial data used in GIS are part of these careers. A great need to preserve, curate, and make findable geospatial data results from advances in open source GIS software, the rise in popularity of mobile technologies, the GeoWeb, volunteered

geographic information (VGI), and the expansion of private sector data sharing projects. The paper will discuss course and program development using job analyses and evaluation of student learning outcomes.

Ruth Bowling, Department of Geography, University of Tennessee. "Creating Place, Building Community: A Case Study of the Antagonist Art Movement." In this thesis, I explore the ways in which the Antagonist Art Movement create alternative spaces outside of the global art market and examine its networks of communication. New York City-based artists formed the Antagonist Art Movement in 2002 with a goal to encourage artists to continue creating art despite personal or financial limitations. The movement continues to expand its networks of like-minded artists both domestically and internationally. The artists converge in New York City, Berlin, and other cities to collaborate on art projects that are free to the public. I use qualitative methods to explore the geographical relationship of these artists to cities and broader economic structures. The results provide insights into the ways in which contemporary social movements develop and contribute to the literature on social movements and networks.

Jiaoli Chen, Department of Geography, University of Tennessee. "A Space-Time Prism Approach for Scheduling Daily Activities in Real Situations." Activity scheduling problem has been widely discussed in activity-based travel demand studies by many civil engineers and some geographers. Modern information and communications technologies have enabled additional spatial and temporal flexibilities of daily activities. This has brought up both opportunities and challenges to personal activity scheduling. Motivated by the belief that spatial scientists can make a significant contribution to human activity scheduling problem with considerations of various constraints, this paper develops an efficient and practical approach for individual activity scheduling in real world situations such that it can meet the following objectives: 1) It will honor daily mandatory activities as well as an individual's time and location preferences of discretionary activities; 2) It will

suggest activity sequence and locations of discretionary activities with a consideration of minimizing total travel time; 3) It will consider facility open hours; 4) It will evaluate if all intended activities can be carried out under the space-time constraints; 5) If it is not feasible to accommodate all activities, it will evaluate the maximal possible activities, locations and sequences under the space-time constraints.

Savannah Collins and Henri Grissino-Mayer, Department of Geography, University of Tennessee. "Detecting Tropical Cyclone Signals in Tree-Growth Responses of Longleaf Pine, Lake Louise, Georgia, USA." The study of past hurricanes (termed "paleotempestology") provides baseline information that can be used to place current and future tropical cyclones (TC) in historical perspective. Paleotempestology uses geological and biological proxies to reconstruct TC activity to learn more about the temporal and spatial dynamics of TC activity for hundreds and even thousands of years in the past. TCs are influenced by several elements, including warming ocean waters which may alter TC frequency and intensity. Understanding how hurricanes will be influenced by a warmer future is critical, and reconstructions of TC activity from previous warm periods of the Holocene will be beneficial. In this preliminary study, tree-ring data derived from longleaf pines from Lake Louise in Valdosta, Georgia, were first modeled against 20th century climate data to develop residuals of tree growth with the dominant climate signal removed. The residual tree-ring data were compared with data obtained from the North Atlantic Hurricane Database (HURDAT) that include all storms that tracked within a 100-kilometer radius of our site during the period 1895 to 1999. We found that at least four major TCs correspond with abrupt decreases in pine growth. Two of the growth suppressions were followed by a sharp increase (or release) in tree growth. Although our study analyzed data only since 1895, we hypothesize that abrupt-onset growth suppressions followed by gradual releases may indicate past TC activity in our data set back to the early 1400s, thus informing coastal environments on the frequency and impact of previous major landfalling TCs.

Matthew Cook, Department of Geography, University of Tennessee. “The Textual Politics of Alabama’s Historical Markers: Slavery, Emancipation, and Civil Rights.” Geographers have recently argued that scholars of memorial landscapes should pay critical attention to the ways in which language contributes to or challenges normative memoryscapes. Building upon methodologies of analyzing “textual politics” from recent memory studies scholarship, I investigate how three major periods of African American history - slavery, Emancipation, and the Civil Rights Movement - are represented in (or absent from) state historical markers in Alabama. Alabama’s history has included a complex amalgamation of white supremacy, African American resistance, and successes and failures for both sides across many decades. Content and discourse analysis of Alabama’s historical markers reveal that their texts presents a version of history that is dominated by white historical narratives. Slavery is particularly underrepresented, as slaves are typically mentioned as numbers rather than people, and the oppressive nature of slavery is discussed on only once. Emancipation - as a discursive concept and a time period - is also extremely marginalized. The Civil Rights Movement is the best represented of the three time periods, as one might expect to find in a state that markets itself as a Civil Rights heritage destination. Older Civil Rights markers focus on the Movement’s major events and leaders, while more recent markers commemorate lesser-known people and locations that were vital to the “everyday” work of the Movement. I conclude that the memoryscape of African American history in Alabama has improved over the last decade, but much work must be done to achieve equal representation with the dominant white Southern historical narratives.

Courtney Cooper, Department of Geography and Planning, Appalachian State University. “Mixed Methods Techniques for Analyzing Water Quantity Perceptions in Western North Carolina.” Perceptions about water quantity are understudied within the growing body of research on water policy, especially in humid area case studies. With an average annual rainfall of 50 inches,

water quantity concerns may seem remote in Western North Carolina, but drought conditions and growth increase regional water supply pressure. This study follows a previous university led study on the perceptions of water utility managers in regard to water conservation and supply. Public willingness to pay (WTP) and perceptions were measured to analyze how people understand the benefits of water conservation measures. Information regarding WTP was gathered through a contingent valuation (CV) survey question series. The survey was mailed in the spring of 2013 to a random sample of 3000 residents in two counties in Northwestern North Carolina resulting in a 30% response rate and N=714. Analyzing and mapping the results indicate that residents living in more populated towns, and using municipal water sources, tend to have a higher WTP for water conservation measures than people living in rural areas and withdrawing water from private sources. Future plans to expand this project to a watershed level will allow for a more comprehensive and applicable analysis.

Kevin Durand, Department of Sociology, University of Tennessee. “Toeing the Line: Precarious Employment in Tennessee.” Work is a central activity in society and a primary source of income for purchasing essential items. It also shapes people’s social, psychological, and economic well-being by linking individuals to each other. Good jobs provide a foundation for a high quality of life, healthy workers, and strong families and communities. Workers who have job security are more likely to be able to put down roots in a community, conceive and raise children, buy a house, and invest in family lives and futures. Thus, work reveals much about the social order, how it is changing, and the kinds of problems and issues that people, communities, and governments are experiencing and addressing. This paper provides a brief introduction to the terms precarious work, precariat, and precarity, and a brief historical overview of the changing nature of work in the U.S. and Tennessee. It highlights the employment at-will doctrine and its three major judicial exceptions, and right-to-work laws and civil service reforms that influence the development of precarious work. The Tennessee Supreme Court adopted the employment

at-will doctrine in 1884. This court decision has contributed to increases in the precariat and precarity. Lastly, this paper briefly examines recent contestations of precarity in Tennessee.

Erin Eldridge, University of Tennessee. “The Political Ecology of Coal Disasters and Post-Coal Possibilities in the Appalachian South.” Coal has long been central to economic development efforts to “modernize” the Appalachian South. It is a resource that links development in the mountains to projects of modernity in the broader Tennessee Valley; yet, the production and use of coal have shaped human relationships with the environment in ways that produce hazards and vulnerability. Drawing on research from the 2008 coal ash disaster and the history of coal disasters in the region, this paper will explore the value of a political ecological approach for examining the intersections of development and disaster. It will also discuss the need for collaborative, imaginative, and counter-hegemonic approaches for exploring and envisioning economic alternatives as coal continues to decline in the mountains of the region.

Kelsey N. Ellis, Department of Geography, University of Tennessee, Jill C. Trepanier, Department of Geography and Anthropology, Louisiana State University, Robert E. Hodges, Department of Geography, Florida State University. “Using Synthetic Tropical Cyclones to Characterize Extreme Hurricanes for Charleston, South Carolina.” A hurricane’s track is influenced by a number of oceanic and atmospheric variables that direct the storm, while also impacting other storm characteristics such as intensity and forward speed. Some of these influential variables are semi-permanent in nature or oscillate regularly, resulting in distinguishable patterns of hurricane tracks across space. Therefore, a particular city can expect hurricanes of a typical track type, with their more intense hurricanes being those whose track capitalizes on conditions favoring intensification. Our interest is in the track of the strongest hurricanes experienced by a city, and here we focus on a “100 year event” for Charleston, South Carolina. Due to lack of an extensive tropical cyclone database, there are few of these

events in the written record. We remedy the lack of observations by utilizing synthetic tropical cyclones to help characterize extreme hurricane events for Charleston. In addition to track, we analyze other storm characteristics such as forward speed and cyclogenesis location in order to further understand the unique qualities of these elusive events, and determine what conditions favor an extreme hurricane to impact Charleston.

Kathleen Ernst, Oak Ridge National Laboratory. “Who Cares About Climate Change? The Challenges of an ‘Economically Unviable’ People.” Scholars and land managers alike are increasingly interested in how to respond to current and anticipated climate changes. Public lands have become a sort of living laboratory of land management practices over the past one hundred years, and many are currently coping with how to respond and adapt to a changing climate. This is the case in Kakadu National Park of the Northern Territory of Australia where the Bininj/Mungguy people are traditional owners of the land, and therefore are in charge of all land management decisions within Kakadu National Park. However, decisions regarding climate change in Kakadu National Park are often stalled by other issues that take precedence over climate change adaptation. These problems range from deaths in the community, to the suspension of the Racial Discrimination Act by the Australian government, the threat of government takeover of traditionally owned land, and being displaced and placed into settlements that negatively impact Aboriginal individuals and communities. This paper considers the case of the Bininj/Mungguy and their inability to respond to climate change due to threats of another kind – specifically the threats of the Australian government taking over traditional lands and actively undermining the traditional rights of Aboriginal communities across Australia.

Henri Grissino-Mayer, Department of Geography, University of Tennessee. “A Dendrochronological Approach to Biogeography in the Southeastern USA.” Dendrochronology has a long history of applications across multiple disciplines (such as ecology, archae-

ology, and geology), but has formed a particularly strong disciplinary bond with biogeography in the last 20 years. The science has been used, for example, to justify certain efforts in ecosystem management practices in the hope that certain habitats can be restored (although true restoration can never be achieved). For example, studies that use tree-ring based fire history are used to develop and implement fire management guidelines enforced by federal and state land management agencies. The field has been especially useful in learning about the present state of U.S. forests: how have our forests changed in composition over time? Has the structure of these forests changed over time? What is the successional trajectory of these forests? In other words, what will our future forests look like? The science has been used to investigate disturbance processes that affect our forests, everything from wildfires to insect outbreaks to hurricanes to air pollution to coal ash spills. Lying in the background to all these processes lies the overarching climate signal inherent in all trees, resulting in a complex array of crossover information with which the dendrochronologist must contend. Our methods are designed to enhance that signal in which we are interested while minimizing the effects of influences not of interest, but which must still be accounted. The science requires background in a myriad diversity of other disciplines, including botany, basic and advanced statistics, climatology, and ecology, and even archaeology and geology. The field of biogeography, however, provides the all-important principles that dendrochronologists have embraced.

Jamie Haverkamp, Department of Geography, University of Tennessee. "Institutional Actors' Perceptions of Climate Change and their Implications for Decision-Making and Equity: A Case Study in Hampton Roads, Virginia, USA." This research seeks to understand institutional underpinnings shaping adaptation to climate change. Through a case study of coastal adaptation in Hampton Roads, Virginia, this research investigates the socio-political landscape in which adaptation decision-making is occurring; identifies institutional attitudes, perceptions, and responses to climate change; and applies theories of adaptation governance

and vulnerability. The purpose of this research is to contribute to the current state of adaptation science, through the gathering of empirical evidence of adaptation decision-making, and addressing issues of equity. Through a qualitative methodological approach, data was gathered using semi-structured interviews of institutional actors, direct observation at two regional adaptation forums, and a discourse analysis of comprehensive city plans. The research findings are three fold. First, because of overriding attitudes of fear and uncertainty, adaptation decision-making in Hampton Roads is largely an "inner circle" process, fostering participation between social elites, and limiting the engagement of other stakeholders. Second, stakeholders with a voice in community-level adaptation view regional vulnerability to climate change as the result of financial capacity and the natural environment, thereby overlooking the social determinants of vulnerability to environmental hazards. Third, institutional responses to climate change in Hampton Roads are ineffective in meeting the needs of the region's most vulnerable populations, and may enable a downward spiral of vulnerability to regional flooding impacts for the social groups with the least adaptive capacity. Through a better understanding of institutional adaptation, inadequate or maladaptive responses to climate change may be less likely to occur.

Sally P. Horn, Department of Geography, University of Tennessee. "Pollen, Spores, and Charcoal in the Surface Sediments of a Glacial Lake." Patterns of pollen and charcoal deposition in lake-surface sediments have been investigated at a number of mostly temperate lakes to support interpretations of microfossils in sediment cores. Sediment redistribution within lakes is usually found to result in fairly gradual changes in pollen percentages from point to point within lakes. However, at some lakes researchers have found the abundance of certain pollen types, or ratios between types, to change systematically with changes in depth or distance from shore. These types and ratios are valuable to identify as they can potentially serve as proxies to chart past changes in lake levels. With that idea in mind I examined pollen, spores, and microscopic charcoal in dredge samples

collected along transects across Lago de las Morrenas 1 (3477 m, 9°29'40"N, 83°29'14"W), a tarn on the Chirripó massif of the Cordillera de Talamanca in Costa Rica. For the most part, pollen concentrations and percentages did not change consistently along transects. The exceptions were the ratios of Isoetes spores to pollen grains, and of grass pollen to oak pollen, which in both cases were higher nearshore. Charcoal:pollen ratios and concentrations of microscopic charcoal in surface sediments did not show clear patterns with distance from shore, perhaps because of the influence of inflowing streams. I discuss the application of these findings to the interpretation of Late Pleistocene and Holocene microfossil records from Lago de las Morrenas 1 and nearby lakes.

Tanner Jessel, School of Information Sciences, University of Tennessee. "Geocoding in Geographic Information Retrieval Systems." Information with a geographic component is among the most valuable and sought after types of information. However, the majority of geographical information exists as indirectly referenced locational information within unstructured text. Even among well-annotated, spatially explicit datasets, existing metadata can be of sparse, inconsistent, or otherwise of poor quality due to time and budgetary constraints. For these reasons, automated annotation of spatially explicit coordinates, a process known as geocoding, is an active area of research in geographic information science. Research concerning geocoding represents a long-term effort with a body of knowledge that has grown across several decades. Unfortunately, funding cycles are not always long-term, and some groundbreaking technologies and tools are no longer available. The present article attempts to synthesize the current state-of-the-art of geocoding and presents a "toolkit" of resources used across the literature to accomplish geocoding, with an emphasis on applications for geographic information retrieval.

Adrienne Kembel and Amanda J. Reinke, Department of Anthro-

pology, University of Tennessee. "An Anthropological Approach to Place and Space: How Identity and Politics are Intertwined with the Physical Landscape in Northern Uganda." After decades of intrastate conflict in northern Uganda between the government and the Lord's Resistance Army (1986-2006), the 'post-conflict' period has ostensibly begun and the country is implementing steps for recovery and development. However for the general populace in the north this transition is riddled with a myriad of problems including: limited access to social services, education, poor infrastructure, a lack of sufficient healthcare, high rates of alcoholism, spiritual disturbances, and increasing land disputes. This paper is an overview of how the social relations between the living, as well as, the relationships the living have with the dead are intricately bound up in how individuals and groups relate to the physical landscape. Based on primary research in the region, the authors use a place-space theoretical framework to structure their analysis of how northern Ugandans relate to and use the dead as a link to the physical landscape and how this relationship to land and land disputes, in turn, affect how the living (re) define identity, space, need, and belonging amongst themselves, the government, and international actors within this post-conflict period.

Matthew T. Kerr, Sally P. Horn, Chad S. Lane, Department of Geography, University of Tennessee. "The Relationship between Organic Matter and Organic Carbon in Lake Sediments from Laguna Santa Elena, Costa Rica: A Preliminary Assessment of the Potential as a Paleoenvironmental Proxy." Lake sediments are important archives of human-environment interactions and land-use history in the neotropics. Sediments comprise both organic and inorganic components. Organic carbon (OC) is the principal component of sedimentary organic matter (OM). Loss-on-ignition provides an estimate of OM in sediments and isotope ratio mass spectrometry yields data on OC content. In an ideal situation, when OM equals zero, OC also equals zero, with both increasing in a predictable, often linear relationship. Changes in prehistoric land use in watersheds can alter the OM/OC ratio of sediments, and lakes record

those changes over time. The OM/OC ratio appears responsive to changes in nitrogen content of the sediments. This paper explores the relationship between organic matter estimated by loss-on-ignition and organic carbon measured by mass spectrometry in lake sediments from Laguna Santa Elena, Costa Rica (8.9306 N, 82.9275 W, 1055 m elevation), and offers a preliminary assessment of the potential for that relationship to act as a proxy for paleoenvironmental change in the area.

Brian Casey Langford and Jiaoli Chen, Department of Civil and Environmental Engineering and Department of Geography, University of Tennessee. “Studying User Behavior and Safety on Electric Bicycles based on GPS Tracking Data.” As electric bicycles (e-bikes) have emerged as a new transportation mode, their role in the transportation system and potential influence on user behaviors has become an important topic. Improved performance on e-bikes compared with regular bicycles creates concern for user safety. An e-bike sharing system at the University of Tennessee provides a unique setting for studying user behaviors on this new transportation mode in direct comparison to behaviors on regular bicycles. Observations of behavior under various situations, such as behaviors on roadways, on greenways, and through intersections provide empirical evidence for analyzing and comparing user safety on the two modes. The study uses GPS devices installed on each bike to monitor user behaviors with the two modes and Geographic Information System (GIS) techniques to process large amounts of GPS tracking data and study those behaviors within the transportation network. This paper presents the methods and strategies used in collecting and analyzing trip data through GIS techniques. It also presents the limitations of that data and analysis with regard to the goals of this study. This paper is submitted for the GIScience session; however, it could also be suitable for the human geography session.

Ephraim Love, Department of Geography, University of Tennessee. “The Effects of Multispeed Regulation on the Cannabis

Market: Lessons from Crowdsourced Data.” In 2012, nearly three quarters of a million United States residents were charged with cannabis related violations. Estimates suggest that 4% of US residents consume marijuana at least once per year, but this varies greatly across demographic groups; survey data has shown rates of cannabis use over 50% on many college campuses (Bell, Wechsler, and Johnston 1997). The total cost of enforcing prohibition of cannabis to taxpayers includes the policing, trying and jailing of violators as well as lost tax-revenue from the growth, distribution and purchase of what is likely one of our nation’s largest agricultural industries. Estimates in 2002 suggested these expenditures and lost tax revenue totaled over 10 billion dollars per annum (Miron 2005). I build upon extant theories and use spatial-temporal analyses observe cannabis market-dynamics. This analysis attempts to improve upon representativeness of the pricing data to be explained, by leveraging web-scraped, crowdsourced data from PriceOfWeed.Com and fusing this to cartographic databases. This framework allows for a spatial-temporal analysis of effects of cannabis regulation, as well as testing the feasibility of utilizing crowdsourced data to better understand underground markets. Spatial statistical methods show evidence for significant impacts from the multispeed regulation of cannabis, not only on a state introducing new cannabis policy, but on their neighboring states as well as their second order neighbors. These findings suggest that analysis of crowdsourced spatial data is a promising tool for the study of policy impacts on underground markets.

Derek J. Martin, Department of Geography, University of Tennessee, Carol P. Harden, Department of Geography, University of Tennessee, Robert T. Pavlowsky, Ozarks Environmental and Water Resources Institute, Missouri State University. “Examining Longitudinal Patterns: A Geographic Perspective on River Systems Analysis.” Rivers are inherently dynamic systems that function across a variety of spatial and temporal scales. Scientists are taking an increasingly holistic approach to the analysis of these systems by increasing the size of the lens through

which river systems are viewed. Geographers are especially well positioned to implement this approach because of their unique understanding of scale and geospatial technologies. In this presentation I provide a geographic perspective of river systems analysis by highlighting two studies conducted in the Missouri Ozarks region that directly address (1) issues of spatial and temporal scale, and (2) interactions between the riverine and terrestrial environment. The first study examines patterns of channel planform change over a period of 50 years, and how those patterns may be a reflection of changing land use in the watershed. The second study investigates patterns of riparian wood deposition within a river system, and how those patterns may have important implications for river system management. This synopsis is meant to exemplify one of the current trajectories in river systems science and highlight the important role of Geographers in understanding these systems.

Maegen Rochner, Department of Geography, University of Tennessee. “Dendrogeomorphic Analysis of Debris Slides on Mt. LeConte, Great Smoky Mountain National Park, Tennessee, USA.” Dendrogeomorphology, the reconstruction and analysis of geomorphic processes through tree-ring science, was first established as a particular form of dendrochronology by Alestalo in 1971 and has since become an important part of land-use planning and mitigation in areas prone to slope failure processes. Early research led to the development of methods unique to dendrogeomorphology but maintained the fundamentals of basic tree-ring analysis. More recent research has begun to apply the concept in the mountainous areas of Europe and the western and southwestern United States. However, few studies have been performed in the eastern U.S., where debris flows, landslides, and rock falls in the Appalachians pose a common threat to human life and property. One area of particular interest is Great Smoky Mountains National Park (GSMNP). The goal of research performed in this study is to, as a proof of concept, determine if and how dendrogeomorphic study might apply in

the Appalachian region, with emphasis on GSMNP, by attempting to reconstruct known debris slides on Mt. Le Conte, GSMNP, using tree-ring evidence. Red spruce (*Picea rubens* Sarg.) were targeted for sampling based on their proximity to slide boundaries. Collected, prepared, and measured individual tree-ring series were analyzed using a combination of visual and graphical inspection with JOLTS disturbance detecting software, with preliminary emphasis placed on the twelve best series so far collected. Results have thus far been inconclusive but point towards an event date within the time period of 1946-1949 which was noted by JOLTS in 45% of the twelve series.

Tyler Sonnichsen, Department of Geography, University of Tennessee. “‘The Boston I Knew is Lying on the Ground’: Reinterpreting Boston Landscapes Through Song.” On the recently rediscovered LP “Urban Development” and other Swan Songs of Old Boston, producer/narrator Arthur Fiedler and singer Francis WhitingHatch unleashed a fierce sentimentality for the Boston of their youth; raw, real, uncom-promising, and above all, unapologetically romanticized. From a cultural geographic perspective, this album is a permanent snapshot on the discourse that surrounded a reinvented New England city in the early 1960s. Few similar musical documents exist, and judging by the lack of presence of this LP anywhere on the internet, it is relatively untouched piece. “Urban Redevelopment” and other Swan Songs of Old Boston is a veritable time capsule of not necessarily a moment in time of the palimpsest landscape of Boston, but a love letter to an antiquated way of life there. It provides us with a snapshot of an elaborate set of emotional geographies that took place in the early 1960s. The city was plowing under and crushing a series of landmarks that had connected generations: Scollay Square, the Howard Theater, Mechanic’s Hall, Foster’s Wharf, and more. This paper will critically analyze Hatch’s songs in terms of not only the places and people they commemorated, but also cast a discourse analysis on the public memory phenomena they represented at the time and in light of today’s Boston. I will also incorporate research on

these deceased places (whether they were all that Fiedler and Hatch expressed) as well as juxtaposing them with the current form and function of the spaces that they occupied during the 20s and 30s.

Linda Sylvester, Department of Geography, University of Tennessee. “Spatiotemporal Clustering of Extreme Hurricane Wind Events Impacting US Coastal Cities.” Hurricanes are destructive events that produce extreme wind speeds and storm surges. The definition of extreme, however, will vary from one location to another. This study defines the return levels of local extreme hurricane wind events in order to ascertain any spatial and temporal clustering that may occur. Focusing on hurricane winds within a 100 kilometer radius around fifteen coastal cities, four U.S. regions are analyzed by using historical hurricane data from the National Hurricane Center. The Poisson probability of a region experiencing a given number of extreme events per decade is compared to the observed number of extreme events per decade in order to test for decadal clustering. Results suggest temporal clustering along the Florida and Atlantic coasts, but a relatively even distribution of extreme events along the Gulf of Mexico coast. Analyzing the variable risk and clustering tendencies of hurricanes can facilitate future forecasting and research as well as aid in local planning and preparation.

Ryan Taussig, Department of Music, University of Tennessee. “Landscape and Soundscape in Olivier Messiaen’s *Des canyons aux étoiles . . .*” Olivier Messiaen (1908-1992) is well known for his use of birdsong as inspiration in his compositions. Other well documented influences upon his music include landscape, religion, and color. This paper examines Messiaen’s conflation of these themes in *Des canyons aux étoiles . . .* (1971-1974) [From the *Canyons to the Stars . . .*]. Scholars typically address these separately, but my research demonstrates that Messiaen’s musical use of soundscape exists in tandem with, not separate from, his religious predilections. I argue that Messiaen viewed the natural world, unconstructed by humans, as a divine artwork

and utilized landscape inspired sounds in conjunction with birdsong to represent it musically. A three-part work consisting of twelve movements (split five-two-five), *Des canyons aux étoiles . . .* calls for solo piano, solo horn, xyloimba, glockenspiel, a full wind section, and a small string section. To explicate the array of motifs present in the work, I focus on interpreting Messiaen’s musical symbolism in the last movement of each part; these are titled after the locations Messiaen meant to sonify in the music—Cedar Breaks, Bryce Canyon, and Zion Park. Here I draw especially upon the work of Robert Fallon in addition to Messiaen’s own writings and his interviews with French music critic Claude Samuel. I ultimately conclude that Messiaen’s drew inspiration from his natural surroundings due to a spiritual imperative to glorify God’s creation and ensure its preservation amidst the challenges of the contemporary world.

Liem Tran, Department of Geography, University of Tennessee. “Progresses and Challenges of Regional Integrated Environmental Assessment in the US.” The U.S. Environmental Protection Agency’s (U.S. EPA) Regional Vulnerability Assessment (ReVA) program has focused much of its research over the last ten years on developing and evaluating integration methods for spatial data. An initial strategic priority was to use existing data from monitoring programs, model results, and other spatial data. Because most of these data were not collected with an intention of integrating into a regional assessment of conditions and vulnerabilities, issues exist that may preclude the use of some methods or require some sort of data preparation. Additionally, to support multi-criteria decision-making methods need to be able to address a series of assessment questions that provide insights into where environmental risks are a priority. This paper provides an overview of various spatial integration methods that can be applied towards regional assessment, along with preliminary results as to how sensitive each method is to data issues that will likely be encountered with the use of existing data.

Tom Torres, University of North Georgia. “Mapping (with) Communities: GIS and Storytelling in Black Belt Tourism.” By incor-

porating multimedia into a GIS, the methodology presented in this paper addresses some of the weakness of Participatory GIS and highlights new obstacles. This approach was collaboratively designed in the Alabama Black Belt community of Gee's Bend and was used for narrative production and asset mapping in support of community-based tourism. Using a system that incorporates multimedia not only increased residents' participation in the GIS, but also facilitated storytelling processes in the community of Gee's Bend. The mapping project initially gave residents control over community narratives, allowing them to choose which stories to share and to withhold from visitors. However, issues with access and ownership, the pitfalls of conventional development, stalled this process. This paper addresses some of the issues that arose within the project and discusses the current state of tourism in Gee's Bend.

Micheline van Riemsdijk, Department of Geography, University of Tennessee. "Attracting the Best and Brightest: Perspectives of HR Managers and Foreign-Born Engineers in Norway's Oil and Gas Industry." The global financial crisis resulted in extensive layoffs and hiring freezes worldwide. The Norwegian oil and gas industry forms an anomaly to this global trend, as various companies recruited workers from abroad to fill labor shortages. This presentation investigates the ways in which oil and gas companies recruit engineers to Norway. It incorporates the perspectives of human resource managers on engineering shortages, and the ways in which the financial crisis has affected their recruitment and hiring practices. The presentation also discusses the employment and location decisions of foreign-born engineers in Oslo, Kongsberg and Stavanger. The findings are based on in-depth interviews and an online survey for foreign-born employees in Norwegian oil- and gas companies. The presentation draws on literatures on global engineering shortages and international skilled migration under crisis to place talent recruitment in Norway in a larger political, social, and economic context. The findings indicate that Norwegian oil- and gas companies experience hiring difficulties despite

the global financial crisis. They use recruitment incentives, (re) branding campaigns, and domestic training programs to try to meet their talent needs, but it is increasingly difficult to find the right people with the right skills.

Robert Washington-Allen, Department of Geography, University of Tennessee. "A Primer on the Use of Remote Sensing to Assess Carbon Fluxes at Local to Global Spatial Scales." The United Nations (UN) has developed a program with the goal of reducing global greenhouse gas emissions from deforestation and land degradation in developing countries called Reduction of Emissions from Deforestation and Degradation (REDD). REDD programs ask: How much carbon do you have in your vegetation? I will present research that looks at the response of vegetation (and soil) 3-D structure, biomass, and carbon including net primary productivity (NPP) to fire, invasive, species, climate change, herbivory, and land use practices using active and passive remote sensing technologies including ground penetrating radar (GPR), terrestrial laser scanning (TLS) technologies, airborne and satellite LIDAR and RADAR including IFSAR, and data products from time series of Advanced Very High Resolution Radiometer (AVHRR) and Moderate Resolution Imaging Spectroradiometer (MODIS) satellite data at regional to national scales. I will present examples from past and ongoing studies in Costa Rica, Mozambique, the southern Philippines, South Africa and the western US.

Yang Xu, Shih-Lung Shaw, Ziliang Zhao, Department of Geography, University of Tennessee. Understanding human mobility patterns is important to a wide range of application fields. Spatiotemporal information embedded in large mobile phone datasets provides us with new ways of investigating people's travel and activity patterns. However, we still have a limited understanding of the geographical disparities of people's mobility patterns, which could be affected by the socioeconomic and demographic characteristics of their living environment. This study introduces a home-based approach to study human

mobility patterns using mobile phone location records. First, the home-centered standard distance (HCSD) is computed to measure the diffusion of each individual's activity space centered at the residential location. Second, we measure the aggregated mobility patterns of individuals who live in different parts of a city using their HCSD and residential anchor points. The result indicates that a large proportion of the individuals in the study area of Shenzhen, China exhibited a relatively low level of HCSD (43% of total with $HCSD \leq 1km$) while certain people can have large home-centered activity space (23.9% of total with $HCSD \geq 5km$). The geographical difference of people's aggregated mobility patterns in Shenzhen is obvious. People who live in the northern part of Shenzhen generally exhibited a relatively low level of HCSD. While in the southern part where economics is highly developed, the level of people's HCSD is on average higher. The spatial pattern also suggests that areas with good transportation services and less population density exhibited a very high level of HCSD. The findings could have multiple implications on urban planning, transport design and location-based services.

Huairan Ye and Hyun Kim, Department of Geography, University of Tennessee. "Measuring Spatial Health Disparity in a GIS Environment: A Case Study of Hillsborough County, Florida, USA." The health delivery system has been greatly transformed and widely examined in the United States during past decades. Despite having the most developed health care systems in the world, the spatial disparity of access to health care is well observed. In addition, the increasing diversity of class, culture and ethnicity is transforming the urban landscape in America and has a significant impact on health disparity. Under this dynamic context, the goal of this paper is to address the spatial disparity of health in a GIS environment. Ensuring a desired level of accessibility for patients to the health care system is the key element within the health care delivery system, highlighting the geographical relationship between supplying health care service providers to populations in need. Traditionally, researchers

greatly rely on statistical methods to address health care need and socioeconomic deprivation. GIS plays an increasing role in understanding and analyzing accessibility to health care by incorporating geographical physical barriers. It highlights geographical or spatial accessibility, the geographical dimension of access. In this research, we develop a method to examine spatial disparity to locations of registered medical doctors and facilities using the data from Medical Quality Assurance Services (MQA) and US Census as a case study of Hillsborough County, Florida. The result of this research reveals spatial discrepancy of health accessibility in this region, and provides an effective method to capture health accessibility surplus as well as shortage areas for future health care service planning. This shall be an important contribution to a broader literature as the United States undergoes a profound transition due to changes in national and regional health policy.

POSTER ABSTRACTS:

Sarah Bleakney, Department of Geography, University of Tennessee. "Stable Isotopic Signatures in Charcoal from a Costa Rican Sediment Core." Stable isotope analysis is a useful tool for investigating paleoenvironments. This study presents methods and results of isotopic analysis of macroscopic charcoal from lake sediments to reconstruct prehistoric land use in the basin of Laguna Santa Elena, Costa Rica (8.9306 N, 82.9275 W). We used charcoal $> 500 \mu m$ from a sediment core that was recovered for previous analyses of pollen and charcoal evidence of land use history (Anchukaitis and Horn, *Palaeo*, vol. 221, 2005). The Santa Elena core covers ca. 1800 years, and more recently was studied by Kerr (2014, MS thesis, University of Tennessee), who analyzed stable carbon and nitrogen isotopes in bulk sediments as additional proxies for environmental change in the basin. For this study, charcoal was picked from Petri dishes containing sieved charcoal and sediment from the previous analysis, weighed, and placed in tin capsules for isotopic analysis at the University of North Carolina Wilmington. The charcoal samples

had relatively positive $\delta^{13}C$ values, indicating a C4 component to biomass burning. This suggests agricultural crops and weeds as the source of the charcoal, rather than C3 native tropical forest. This finding is supported by the presence of maize pollen and isotopic signatures of bulk sediments

Gareth Butler, Department of Geography, University of Tennessee. "Recruitment of Foreign-born Engineers." The oil and gas industry in Norway often recruits engineers from outside of the country. These engineers are skilled and have to meet educational standards to be considered for a job. In order to find such talent, the oil and gas companies have to develop a plan to find these candidates and ensure that they will migrate to Norway for work. They have to find a way to stand out so that prospective engineers will choose their company over their competitors. This poster explores the tactics that oil and gas companies use to make sure that foreign-born engineers will choose to work for their company and relocate to Norway. The poster also takes an in-depth look how oil and gas companies in Norway can influence engineers from abroad to leave their home to work for them. The findings are based on an OECD report, a Tekna article, and interviews with a line manager and human resources managers. The poster concludes that the process to persuade someone to migrate for work can be very difficult and sometimes challenging. Overall, companies have to go the extra mile to hire the skilled workers needed to bring their company to the next level.

Jerry Evans, Department of Geography, University of Tennessee. "Tourism in Africa." The purpose of this project is to find out which African country has the potential to become a tourism powerhouse for Africa. Tourism has become a major constituent of the economy of many African nations over the past few decades; the countries that lead the continent in tourism are Egypt, Tunisia, Morocco and South Africa. Data was provided by the World Bank and various tourism ministries to help with this project. The results show that Tanzania has the most resources

and potential to make major strides in tourism. Tanzania has many national parks and Mount Kilimanjaro, which is one of the top spots to visit in Africa. The results of this project is directed at those who are interested in working with tourism in African and potential investors.

Joshua Gelinas and Nate Lawrence, Concord University. "The Influence of Climate and Forest Disturbance on Hemlock Growth in Southwestern West Virginia." Climate and forest disturbance are important drivers in shaping forest composition, structure, and ecosystem function. Understanding the influence of these drivers on tree growth is crucial for informing scientifically-based management programs and predicting long-term forest dynamics. In southwestern West Virginia, temperatures have increased at a rate of 0.02°C per year since the late 1950's. In addition, wide-scale logging since the late 1800s has shaped contemporary forest landscapes in West Virginia. More recently, hemlock forests in the region have been invaded by hemlock wooly adelgid (HWA), an invasive forest pest that is contributing the rapid decline of eastern hemlock. Our research addresses the impacts of these factors on hemlock growth in southwestern West Virginia. Eight permanent monitoring plots were established in July 2013 within Cabwaylingo State Forest in Wayne County. We collected tree core samples at each plot and used standard dendrochronology techniques to analyze relationships between climate, disturbance, and hemlock growth. Results indicate multiple growth disturbances during the 20th Century, most likely due to logging and the loss of American chestnut from Chestnut blight. Climate analysis indicates that hemlock growth was most consistently related to early summer precipitation.

Michael Schilling, Department of Geography, University of Tennessee. "Most Innovative Cities In the United States." Whether it be information technology in San Jose, finance in New York, or entertainment in Orlando, the United States has an abundance of cities innovating in unique ways. Innovation or the process of

introducing new ideas, devices, and methods is important for any city's economic survival and prosperity. Because it is difficult to quantify and rank, defining innovation is opinionated and subjective. Using an innovation index developed by 2thinknow, the top 20 cities in the United States are displayed. 2thinknow uses 162 innovation indicators to rank cities ranging from bicycle friendliness and sports fanaticism to political transparency and student population. Along with these indicators, various data has been added to assist in understanding each city's factors of innovation. Population, education, racial distribution, foreign born residents, and common industries all support my personal definition of innovation. The data for these factors of innovation have been gathered from City-Data.com.

Anders Vaughn, Department of Geography, University of Tennessee. "A Cartographic Overview of the People's Republic of China." In the last several decades, China has emerged as one of the most important nations on the global scale. In recent years, it has become the most populous country in the world, has developed one of the premier manufacturing sectors of consumer products, and has generated an economy rivaled only by the United States. Regardless of disputes concerning China's total land area, it still ranks in the top four biggest nations. Overall, it is crucial to analyze the geography of this country in order to better understand how it has evolved into one of the most essential countries of the world. This poster shows three maps developed to give a basic overview of the country, including a political reference map, a digital elevation model plus labeled landscapes, and a thematic map showing population density and migration flow among provinces.

Kortney Williams, Department of Geography, University of Tennessee. "Traveling By Car During the Jim Crow Era." Many people have learned about hardships during the Jim Crow Era of institutionalized discrimination and segregation, but others may not have known the challenges African Americans faced while traveling by car during this time. Indeed, geographers

are just beginning to examine this era in depth and they have devoted limited attention to the role of mobility, transportation, and the automobile in maintaining and even challenging Jim Crow. Working with and on behalf of the Beck Cultural Exchange Center in Knoxville, Tennessee, my project conducted an oral historical geography project to better understand the obstacles that black drivers faced on the road and how they creatively navigated this hostile terrain. Twelve Knoxvilleians were interviewed, six males and six females ranging between 66 and 88 years of age. Interviews were transcribed and taken through an interpretive analysis to identify major themes and shared understandings among respondents as well as the richness and uniqueness of individual traveling biographies or journey stories. The project was conducted under the auspices of the RESET program (Race, Ethnicity, and Social Equity in Tourism), an initiative that recognizes and analyzes the social injustices historically inscribed into American travel and tourism and the legacies of these injustices in shaping mobility today.

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