



# **SWAAG 2018 Annual Meeting Abstracts**

*Bridging the Trans- &  
Cis-Mississippi Regions*



## **Baton Rouge, Louisiana**

Afrin, Tanzina, Louisiana State University

*Investigation of morphological changes in small coastal rivers during flood event*

**Abstract**

The delivery of fluvial sediment to coastal margins is one of the major concerns for river and coastal morphodynamics. Relevant research has primarily focused on large rivers that transport substantial sediment load and thus are responsible for building deltaic landscapes. However, less research is concentrated on small coastal rivers. A need exists to better understand the sediment dynamics in small coastal rivers that have different backwater regimes than their larger counterparts. The main objective of this research was to examine the influence of backwater on the morphodynamics of a small coastal meandering river during a large flood event. The investigation focuses on gaining a better understanding of sediment transport dynamics and channel bed adjustments over a ~9 km reach of the Lower Amite River in southern Louisiana. A two-dimensional morphological model was developed for the Amite River to simulate the hydrodynamic and morphologic adjustments to elucidate the backwater variability on sediment transport. The two-dimensional model was developed with high-resolution bathymetric data obtained from a multibeam echo sounder. Velocity measurements acquired using a boat-mounted acoustic Doppler current profiler and water stage data from the United States Geological Survey were used to calibrate the model parameters. The backwater impact on river morphology adjustment was assessed by considering the predicted sea level rise after 50 years from present condition.

Albert, Donald, Sam Houston State University

*Visual Complement to “Did or Could Seabirds “Halo” Pitcairn Island for Fletcher Christian?”*

**Abstract**

This poster is a visual complement to an article published in *Terrae Incognitae* 50(2) titled “Did or Could Seabirds “Halo” Pitcairn Island for Fletcher Christian?”. This study suggests that seabirds might have acted as navigational beacons for the HMS Bounty in its 1789-1790 search for the remote and uninhabited Pitcairn Island. This South Pacific island was difficult to find because its latitude and longitude coordinates were incorrectly recorded by Captain Philip Carteret’s on its initial sighting on 2 July 1767, and transposing errors by John Hawkesworth, editor of an onboard volume titled “An Account of the Voyages....” published in 1773, added further confusion. Therefore, Fletcher Christian, leader of the mutineers, was initially looking for this island 342 km west of its actual location. Now, fast forward some 250 years and the availability of the Global Positioning System (GPS). Studies are available from biologists employing tracking devices and the GPS to record the foraging ranges of seabird species, including those endemic to the Pitcairn Islands and the South Pacific.\* With these data, foraging range buffers were drawn around Pitcairn Island and its far-flung neighbors (Oeno, Henderson, and Ducie) to illustrate that seabirds might have alerted Fletcher Christian and the HMS Bounty to the island’s whereabouts. \* The

photographs of seabirds in this poster have been used with permission from Visual Resources for Ornithology (<http://vireo.ansp.org/>).

Allen, Ashley, Louisiana State University

*IMPACTS OF TORNADOES ON REGIONAL IDENTITY AND A SENSE OF  
"OKLAHOMANESS"*

**Abstract**

Listening to, engaging with, and sharing tornado stories can help people to establish and engage with a regional identity or sense of "Oklahomaness" as originally outlined by Howard F. Stein and Gary L. Thompson (2009). In this definition, Oklahomaness encompasses what it feels like to be Oklahoman, within and without experience. Tornado stories are meaningful to many individuals and communities within Oklahoma, and the social connections of talking about tornadoes, recent or not, are quite important to regional identity. In this paper, I assert that tornado stories and their meanings are impactful to the regional identities of many Oklahomans. Multiple qualitative methods, including interview, archival research, and photograph analysis were used in order to identify the importance of tornado stories to Oklahomans as a social group, whether they have physically experienced a tornado or not. To many, tornadoes are more than just extreme weather events or risky rare occurrences, they are an integral part of who they are and where they come from. Much importance is also placed on connecting the present to the past, and many Oklahomans have adopted tornadoes as a symbol of strength. What should be a terrifying loss becomes an example of how Oklahomans identify as community builders, helpers, and always "OK."

Astorga, Javier, University of New Mexico

*Disentangling Guyannia from Colonial Mapping and Imperial Diplomacy: Cartographic Legibility of a Territorial Dispute in the 19th century.*

**Abstract**

This project examines the dynamics between geopolitical configurations and geographical discourses behind the cartographic formation of the 'Guayana Esequiba,' a long disputed border territory between Venezuela and British Guyana. Rooted in an ongoing international quarrel as recently set by the Guyanese government to the International Court—in March 19th, 2018—this investigation focuses on a critical revision of contemporary theories and debates within the field of critical cartography and, more broadly, in cultural/historical geography around the actual capacity of colonial map designs to serve as sufficient and legitimate evidence for setting border/territorial disputes at historically challenged sovereignties. In order to historically draw the spatial and political formation of 'The Guyana Esequiba,' this project examines and attempts to provide an analytical framework for discussing the category of 'cartographic legibility' of colonial map designs at the heath of diplomatic bargaining that took place at the end of the 1890s, by using

the actual recordings and archives that led to the Washington Treatise over British Guyana in 1899. More concretely, this discussion examines the dual but conflicting role of historical maps of this kind, that is: their simultaneous role in ‘deciphering’ territories to render them geographically legible, but also their more subtle function as ‘encoders’ of geopolitical configurations, which may turn colonial map designs particularly problematic in setting international border and territorial disputes. This study takes the ‘Schomburgk Line’—the geographical reference for the Venezuelan-Guyanese borderline— as the problematic map design that evolved from the 1890s diplomatic arbitration process.

Asubonteng, Agnes, University of North Texas

### *Spatial Patterns of Air Pollution and Child Obesity in Texas*

#### **Authors**

AGNES ASUBONTENG, JOSEPH OPPONG

#### **Abstract**

Obesity, a major factor in non-communicable diseases, is increasing rapidly in Texas. The prevalence of adult obesity doubled from 15.9% in 1995 to 31.7% in 2010. Among grade 9 to grade 12 children, the prevalence increased from 13.7% in 2005 to 15.7% in 2013. Previous research attributes this to diet, physical inactivity, socioeconomic status, education, race, and environmental factors such as chronic exposure to traffic related-air pollution. While some studies have shown the relationship between child obesity and air pollution in Texas no such studies have been done on the spatial variation of child obesity and these factors. Therefore, using GIS and statistical analysis, this paper investigates the relationship between the above mentioned variables and child obesity. The results provide insights for targeting interventions to decrease child obesity.

Atkins, Dane, Texas State University

### *Optimism Bias in Automotive Drivers*

#### **Abstract**

Automotive crashes are a leading cause of property damage, injury, and death. Crashes are often the result of driver error, with one potential factor being driver's overestimation of their own driving abilities. This research continues the exploration of optimism biases towards driving competency and considers the distribution of this effect both spatially and culturally. A brief survey questionnaire, distributed digitally to several internet user groups, provides a global sample of participants having distinguishable primary interests. The results of the survey confirm a pervasive optimism bias towards respondent's own driving competency and informs our understanding of the social and global distribution of this phenomenon. These results suggest potential benefits from expanding driver education programs to include recurrent training

requirements; such programs might reduce the observed optimism biases and thereby provide potential crash-rate reductions.

BakamaNume, Bakama, Prairie University A&M University

*An Analysis of Health Disparities among Minority Population in Houston, Texas*

### **Authors**

Bakama BakamaNume, Ph.D. Noel Estwick, Ph.D. William Turner, Ph.D.

### **Abstract**

Health Disparities among minority populations in Houston and other places in the country continue to be a persistent challenge, especially to those seeking health equity for all. This research utilized GIS tools to analyze cancer, heart disease, strokes, chlamydia rates, and low birth rates among the African American, Hispanic, and Asian populations in the 88 Super Neighborhoods of Houston. Results of the analysis show positive correlations between all disease rates and the African American population in some neighborhoods. Results are mixed for the Hispanic population. The Asian population relationships were generally negative. All disease rates were found to be high in neighborhoods with low Asian population. Low birth rates were positively correlated with percent African American population and negatively correlated with Hispanic and Asia population groups. The results further support the call for health interventions at local place levels.

Barrett, Clay, Oklahoma State University

*Managing the Complexities of Collaborative Research and Spatial Analysis with Open Source Tools*

### **Authors**

Clay Barrett Department of Geography, Oklahoma State University, Stillwater, OK, Dr. Peter Kedron School of Geographic Sciences & Urban Planning, Arizona State University, Tempe, AZ, Dr. Joseph Holler Department of Geography, Middlebury College, Middlebury, VT

### **Abstract**

The collaborative research process is complex, iterative, and by extension messy. Many of the complexities of collaborative work are an extension of the variety and volume of data produced as researchers and practitioners with different backgrounds go about their work. Researchers may not share software platforms and the software employed by one collaborator often introduces barriers to others. Output portability can likewise be problematic, especially when in a proprietary format. If data are to remain accessible to all parties and support analyses and decision-making, a precise

and flexible organization is essential. This presentation discusses an open source research and data management framework developed within the Oklahoma EPSCoR grant investigating social vulnerability and hazardous weather. As part of a multi-institutional and multi-disciplinary collaboration, this work seeks to make a broader impact on the professional community by presenting how a variety of open source solutions can be collectively organized to manage the collaborative research process. Software recommendations and implementations are discussed, as are instructional vignettes that guide users interested in developing similar data management frameworks. The procurement, management, and analysis of spatial data related to social vulnerability and severe weather are used as an illustrative example.

Bean, Robert, University of Texas - Austin

*Mapping the Areal Extent of Lake Ngami, Botswana 1984-Present Using Google Earth Engine with Radar and Optical Sensors*

### **Authors**

Robert A. Bean, Doctoral Candidate, Department of Geography and the Environment - University of Texas - Austin Kelley A. Crews, Associate Professor, Department of Geography and the Environment - University of Texas - Austin

### **Abstract**

A methodological protocol for detection of ephemeral waterbodies was tested on one of three outlets of the Okavango Delta, Botswana: an ephemeral lake that can vary in areal extent seasonally from 0-200 km<sup>2</sup>. These methods leverage cloud-based image acquisition and processing through Google Earth Engine to examine the shifting extent of Lake Ngami through three different sensor systems with differing data availability and characteristics. First, over a longer time scale, passive optical data (surface reflectance) from Landsat 5 using the Modified Normalized Difference Water Index (MNDWI) was employed to discriminate between land and water extent from 1984-2009. Second, this approach was replicated using passive optical data from Landsat 8 MNDWI 2013-present along with Sentinel-2 (2015-present). Third, active SAR Sentinel-1 sensor data were used to test methods including band thresholding and unsupervised classification allowing, fourth, a comparison of the three methodologies / data sources. Both ISODATA and K-means were used as unsupervised classifiers to extract areal extent of water from Sentinel-1 and compared to areal extent of water from Sentinel-2 generated MNDWI. A key finding upon manual review of 119 TM scenes was that per pixel opacity values in TM scenes affect MNDWI values, yet these are not factored into scene quality or cloud cover values. Comparison of unsupervised classifiers showed ISODATA sometimes over-predicts as much as 40% while K-means derived areas were within 1% of the MNDWI-derivative. A positive correlation was found between Landsat 8 and Sentinel-2 derived MNDWI (0.906 using Kendall's Tau).

Beene, Daniel, University of New Mexico

*Complicating Water Management Binaries in the Rincon and Mesilla Valleys by Coupling Grounded Theory and Geospatial Modeling*

**Authors**

Daniel Beene, University of New Mexico Department of Geography & Environmental Studies

**Abstract**

The Lower Rio Grande Adjudication has in many ways positioned farmers of row crops against pecan growers, predicated mainly on the determination of consumptive irrigation requirements of specific crops. The conjunctive use of groundwater and surface water, which is limited by water availability is further constrained by final decisions from the Adjudication Court, leading to logical conclusions that may presuppose factual error on behalf of the court and its expert witnesses or may insinuate illegal groundwater pumping by individual farmers. I argue that the politicization of water in the Lower Rio Grande Basin of New Mexico in the form of two major legal battles has led to destructive binaries in the discourse surrounding water use and management. Thus, less obvious collaborative mechanisms may be at play regarding the transfer and use of water among farmers of all types in the valley. Despite the potential of these mechanisms, Texas has argued in the U.S. Supreme Court that actions by farmers north of El Paso have limited the efficiency of the river to deliver water across state lines, violating the Rio Grande Compact. Through a series of semi-structured interviews, I will develop a grounded theory that seeks to understand the extent that water allocation and availability can lead to broad landscape changes. Coded responses from these interviews inform weighted criteria in a geospatial model, the goal of which is to spatially represent irrigation management decisions as potential drivers of change and to steer the dominant discourse toward a more productive conclusion.

Bhowmick, Rupsa, Louisiana State University

*Impact of Aerosols and Ocean Temperature on Tropical Cyclone Days near Australia*

**Authors**

Rupsa Bhowmick., Jill C. Trepanier

**Abstract**

The influences of aerosol optical depth (AOD), sea surface temperature (SST) and upper ocean temperature (UOT) on monthly tropical cyclone (TC) days over eastern Australia/southwest Pacific Ocean are examined using data from 1985–2015. The area experiences TCs in November through June with a peak in March. Simultaneously occurring variables are considered as possible predictors of TC days, as well as lagged relationships between the variables. Spearman rank correlation tests showcase the significant relationships between all pairs of variables at a variety of months. A Poisson multiple regression model is applied on TC-SST-AOD and TC-UOT-AOD to find the most significant relationships between the variables. Four significant models are found with normally distributed residuals. December TC days are significantly, negatively related to December SST/UOT and positively to November AOD. January TC days are positively,

significantly related to December SST and November AOD. The difference in directions is related to the temporal lag between a change in the atmosphere (AOD), a response from the ocean (SST/UOT) and an ultimate response in the atmosphere (TC genesis). Probabilities of monthly days during unfavorable and favorable conditions are found. There is high probability of low to moderate number of Jan TC days in low Nov AOD and low Dec SST/OHC and low probability of a higher number of Jan TC days in high Nov AOD and high Dec SST/OHC. This study provides scenarios between the variables to aid in forecasting.

Brammer, Winifred Breck, University of Central Arkansas

### *Barriers in Diffusion of Culture in India*

#### **Abstract**

On a global scale, India is a country that is widely known for its extravagant saris, delicious chicken tikka masala, and elaborate Bollywood movies. Through this globalization, how has India continued to hold tight to its traditional culture? Being topographic and geographically diverse are characteristics that can be attributed to the cultural richness found in India. Even through the westernization of major cities within India — including Bangalore, Mumbai, and New Delhi — these large urban centers still represent and proudly boast ties to their traditional roots in Indian culture. Of course, there is hybridization over time between India's traditional values and a worldwide global culture. The impact of globalization is highly evident through the comparison of small, rural villages to the before mentioned technologically advanced cities. There are many in India that are determined to preserve and protect their traditional culture. They do so in their daily lives through their dress, plowing of fields, harvesting of crops, materials for housing, edible food products, means of travel, and religious practices. The vast majority of Indian people are overwhelmingly representative of their traditional culture. Through this, Indian culture has withstood the test of time and remains as one of the longest lasting cultures on Earth. It is important to investigate what conditions have allowed this long standing country to utilize its barriers in diffusion in order to help individuals gain knowledge of how India has continuously cultivated its culture.

Brannstrom, Christian, Texas A&M University

### *Wind farms as a new driver of coastal change in Brazil*

#### **Authors**

Christian Brannstrom, Department of Geography, Texas A&M University; Adryane Gorayeb, Programa de Pós-Graduação em Geografia, Universidade Federal do Ceará; Wallason Farias de Souza, Programa de Pós-Graduação em Geografia, Universidade Federal do Ceará; Nicolly Santos Leite, Programa de Pós-Graduação em Geografia, Universidade Federal do Ceará; Leilane Oliveira Chaves, Programa de Pós-Graduação em Desenvolvimento e Meio Ambiente, Universidade Federal do Ceará; Rodrigo Guimarães, Programa de Pós-Graduação em Ciências Naturais,



Universidade Estadual do Rio Grande do Norte; Dweynny Rodrigues Filgueira Gê, Programa de Pós-Graduação em Ciências Naturais, Universidade Estadual do Rio Grande do Norte

### **Abstract**

The development of wind power is transforming socio-environmental conditions in Brazil's coastline, especially in the country's northeast region. We applied a "social gap" understanding coupled with spatial analysis of public data in a Geographic Information System to demonstrate that 26% of wind turbines are located less than 5 km from the shoreline and 46% are located within 25 km of the shoreline. In Rio Grande do Norte and Ceará states, approximately 45% of wind turbines and installed capacity are located within 5 km of the shoreline. Field work in six sites demonstrates why conflicts exist between communities and wind farms. We also identify the main factors that have helped to create positive relations between wind firms and communities.

Buenemann, Michaela, New Mexico State University

### *Habitat suitability of Zika and dengue mosquitoes in cities of southern New Mexico*

### **Abstract**

A current and accurate understanding of the spatial distribution of *Aedes aegypti* and *Ae. albopictus* mosquitoes is critical for countering the threat of diseases (e.g., Zika and dengue) transmitted by these mosquitoes. Based on our 2016 work in New Mexico, we now know that the two mosquito species are restricted to urban or built-up land in the southern part of the state. However, we do not know where within these environments the mosquitoes occur, making vector control challenging. To address this issue, we modeled habitat suitability of *Ae. aegypti* and *Ae. albopictus* using mosquito field data and geospatial human and environmental data. We sampled mosquitoes in 354 sites across 13 cities of southern New Mexico. Sampling sites were selected using a proportional stratified random sampling design, with sites allocated relative to city size and sites located randomly in four strata (greenspaces and areas with low, medium, and high development). Mosquitoes were sampled using gravid and sentinel traps and identified using morphological keys. We considered a diversity of human and environmental data layers as potential predictors of mosquito presence, including variables related to demography, economy, housing, land cover, weather, climate, and topography. Habitat suitability modeling was accomplished using logistic regression. Our results show that the occurrence probability of the mosquitoes varies across space, with climate, land cover, and economic variables serving as the strongest predictors of mosquito presence.

Bumgardner, Jude, Louisiana State University

### *Monumental Discourse*

### **Abstract**

Discourse has been described by critical discourse analysts as an opaque power tool, through which racism, domination, and hegemony often manifests. However, for the sake of maintaining face in the public eye, contemporary public speakers are more likely to avoid blatant expressions of racism or hateful speech by employing strategies of racial denial or indirectness. Drawing from the literature on critical discourse analysis, this study aims to examine how New Orleans politicians may employ denial or indirectness strategies when discussing "difficult" topics about racial inequality that affect marginalized groups of people in the local New Orleans landscape.

Bushra, Nazla, Louisiana State University

*The Relationship between the Normalized Difference Vegetation Index and Drought Indices in the South-Central United States*

**Authors**

Nazla Bushra, Department of Oceanography & Coastal Sciences, College of the Coast & Environment, Louisiana State University, Baton Rouge, LA U.S.A. 70803–4105 Robert V. Rohli, Department of Oceanography & Coastal Sciences, College of the Coast & Environment, Louisiana State University, Baton Rouge, LA U.S.A. 70803–4105 Nina S. N. Lam, Department of Environmental Sciences, College of the Coast & Environment, Louisiana State University, Baton Rouge, LA U.S.A. 70803–4105 Lei Zou, Department of Environmental Sciences, College of the Coast & Environment, Louisiana State University, Baton Rouge, LA U.S.A. 70803–4105 Rubayet Bin Mostafiz, Department of Oceanography & Coastal Sciences, College of the Coast & Environment, Louisiana State University, Baton Rouge, LA U.S.A. 70803–4105 Volodymyr Mihunov, Department of Environmental Sciences, College of the Coast & Environment, Louisiana State University, Baton Rouge, LA U.S.A. 70803–4105

**Abstract**

Drought indices are useful for quantifying drought severity and have shown mixed success as an indicator of drought damage and biophysical dryness. While spatial downscaling of drought indicators from the climate divisional level to the county level has been conducted successfully in previous work, little research to date has attempted to "upscale" remotely-sensed biophysical indicators to match the downscaled drought indices. This upscaling is important because drought damage and indices are often reported at a coarser scale than the biophysical indicators provide. This research upscales National Oceanic and Atmospheric Administration's (NOAA's) Advanced Very High Resolution Radiometer (AVHRR) sensor-acquired normalized difference vegetation index (NDVI) data to produce a county-level biophysical drought index, for a five-state region of the south-central U.S.A. The county-level NDVI is then correlated with the downscaled drought indices for assessing the degree to which the biophysical data match well-documented drought indicators. Results suggest that the Palmer Drought Severity Index (PDSI) and Palmer Hydrologic Drought Index (PHDI) are effective indicators of biophysical drought in much of the arid western part of the study area, and in larger swaths of the study area in summer. In nearly all cases except for autumn months, correlations are weakest in the ecotones, with significant negative correlations in the humid eastern part of the study area. Results generally corroborate the findings of recent research that correlations between drought indices and biophysical drought vary spatially. As long-

lead climate forecasts continue to improve, these results can assist environmental planners in preparing for the impacts of drought.

Camacho, Xochizeltzin Castanedo, The University of Texas at Austin

*An approach for measuring socio environmental vulnerability in Protected Areas: The case of Real de Guadalcazar State Reserve, Mexico*

### **Abstract**

The Real de Guadalcazar State Reserve is a Natural Protected Area that is recognized worldwide because of its biodiversity. Despite being considered in Mexico a model for conserving arid and semiarid environments, the deterioration of its natural heritage as well as in the social conditions of its inhabitants has worsened since its establishment. In this study I evaluated the condition of socio environmental vulnerability over a ten year period employing two variables associated in time and space: vegetation deterioration and socioeconomic marginalization at the town level. I employed a supervised classification, normalized difference vegetation index, principal components analysis, local spatial statistic Moran I, and a reference spatial unit per square kilometer to identify clustered patterns of forest cover loss. In addition, I analyzed social data through the difference of means test to two independent populations. After this process I discovered a negative spatial correlation between the forest cover loss patterns and the intensification of marginalization through the northern and southern zones. The conclusions of this work are that the Real de Guadalcazar State Reserve is a fragile socio natural system whose vulnerability derives in part from ecological factors but also from external pressures.

Christian, Debbie, Univeristy of North Texas

*Locating Disease Incidence Points Using Spatially Adaptive Data*

### **Abstract**

Disease maps depict the spatial variations in disease risk and can be produced in a number of ways. Choropleth maps of disease outcomes generally portray rates using predefined areal units and shades of color to represent intensity. However, choropleth maps are not desirable because the patterns observed are influenced by the choice of spatial unit. This is well-known as the modifiable areal unit problem (MAUP). Further, areal units with small populations are known to yield unstable estimates of disease rates due to the small numbers problem. These issues are generally addressed through the use of smoothing methods including spatial filtering (fixed or adaptive), Bayesian techniques, or geostatistical approaches. Maps produced using adaptive spatial filters are designed to maintain approximately equal population sizes for each rate estimate on the map, thus ensuring a minimum level of statistical reliability. However, if the underlying population data are aggregated to some small area unit such as a zip code, resulting maps may continue to portray different levels of statistical reliability. This is due to the implementation of the adaptive filters

method that is designed to guarantee a minimum lower bound on population size with no limits on the upper bound. In this presentation, I present a modification to the adaptive spatial filter algorithm that allows the user to develop maps with a more uniform levels of statistical reliability by providing finer controls on the population sizes used to calculate each rate estimate.

Christiansen, Thomas, The University of Texas at Austin

*Impact of prescribed burns on vegetation structure, distribution, and composition in Botswana savanna systems*

### **Authors**

Thomas B. Christiansen, The University of Texas at Austin Thoralf Meyer, The University of Texas at Austin Kelley A. Crews, The University of Texas at Austin

### **Abstract**

Fire is a key determinant of vegetation structure, distribution, and composition across spatio-temporal scales in savanna ecosystems. Remotely sensed data have improved our environmental understanding of fire regime properties (e.g. extent, frequency, season, intensity, and severity) in these systems, leading to recommendations for land management and policy making. This paper presents methodological and ecological findings from a multi-year prescribed burn experiment in the Ghanzi region of the Botswana Kalahari leveraging (three-dimensional) pre- and post-structural vegetation measurements with in situ burn intensity readings for insights into vegetation mortality and recovery rates from fire. Three primary research objectives were addressed: (1) What is the historical fire regime of the region observed through remote sensing? (2) How does fire intensity correlate with vegetation mortality? (3) How does vegetation regrow post-fire? The importance of fires could increase through their ability to sustain ecosystem functioning by setting back less desirable grass and woody species while being able to counteract climate-induced environmental changes such as woody plant encroachment. It is therefore critical to study vegetation dynamics and the role of fire for the development of sustainable management strategies to ensure future livelihoods, biodiversity, and carbon storage in the savanna ecosystems of Botswana. Findings reveal extremely high fire intensities (up to 800 °C) but show low vegetation mortality for established trees and significant regrowth of shrubs that were observed as “dead” post-fire. The results will inform both remote sensing and savanna ecology as to best practices in leveraging in situ and remotely sensed measurements, modeling, and management.

Connolly, Matthew, University of Central Arkansas

*Measuring Representative Mountain Bike Impacts in a Protected Drinking Water Supply Watershed*

### **Authors**

Matthew H Connolly, University of Central Arkansas Raven L. Lawson, Central Arkansas Water  
Ashley R. Barto, University of Central Arkansas Mark E. Mahar, University of Central Arkansas

### **Abstract**

Previous research on mountain bike impacts has well-documented mountain bike activity effects under highly controlled experimental conditions in existing multiple use recreation areas. Several studies used specific bike frames, rider weights, and a priori numbers of trail passes. While influential and informative, these studies did not address important resource management concerns such as ridership seasonality, estimated actual usage levels, or recreation activity in protected watersheds. Lake Maumelle is the principal drinking water supply for Little Rock, North Little Rock, and Maumelle, Arkansas. Lake owner, Central Arkansas Water (CAW), does not allow mountain biking in the watershed due to erosion and water quality concerns. Recent increases in Central Arkansas mountain bike recreation and inadequate dedicated trail systems for mountain bikers have strengthened pressures to remove mountain biking restrictions on Ouachita National Recreation Trail sections in the Lake Maumelle Watershed. CAW's Watershed Management team encourages recreational use of the watershed to increase stakeholder support for ongoing water-quality protection efforts. However, formal revision of CAW's recreation management policies requires scientific study without resource degradation. Therefore, we developed a methodology to measure representative mountain bike impacts using GIS, longitudinal field data collection and laboratory analysis, and stakeholder participation. Our method combines matched pair study design, multiple modes of autonomous trail usage monitoring (e.g. rider log forms, rider GPS tracks, etc.), frequent field data collection, frequent laboratory analysis, and local mountain bikers as study participants. We deployed this methodology in September 2018 and will continue collecting and processing data through May 2019.

Craig, Andrea, University of Oklahoma

*Aesthetics vs Safety: How did we end up with so much food packaging?*

### **Authors**

Andrea Craig, Adam Seibel, Jackson Harris, Tricia Miller, and Kylie Beasley

### **Abstract**

This presentation takes a critical look at food packaging, through the lenses of three environment-society interactions: markets, social construction, and risks and hazards. As the United States began to industrialize and mass produce food in higher volumes, companies started packaging food products to keep the shelved food sanitary. Products like cereal are a good example of foods that require packaging for storage but also use the packaging to market their product more effectively as well. Every cereal company produces a similar product but use different labels and designs to set themselves apart from the competition. Today's food packaging does have some benefits, such as sanitation and tamper indication, but do these benefits outweigh the environmental costs that

we are seeing? This presentation unpacks the role of food packaging over time and suggests sustainable ways forward.

Crockett, Hunter, University of Central Arkansas

*A Statistical and Geographical Analysis of Hispanic Voting Patterns in the 2016 Election*

**Abstract**

The 2016 election seemed to initially favor Democratic candidate Hillary Clinton. One of the reasons listed as to why she would win was that she was thought to have had a large majority of the Hispanic vote. Clinton was able to secure the Hispanic vote, but had less of the percentage of Hispanic votes than Barack Obama did in 2012. This study seeks to investigate the voting patterns of the 2016 election to determine if the Hispanic vote helped Hillary Clinton to obtain key swing states. For this study, I chose Nevada, Florida, and Colorado to be both statistically and geographically analyzed. These states were chosen because all of them have sizeable Hispanic populations at the time of the 2016 election. The analysis will compare the percentage of the Hispanic voting age population to the percentage of 2016 Democratic votes cast in the counties. Additionally, the most prominent of the groups that make up the Hispanic population will be divided to determine whether or not the Hispanic population truly reflect a homogenous voting group. The results of this analysis will then determine whether or not the absence of these Hispanic voters from 2012 affected the overall party of these counties in 2016 and whether Hispanic populations should truly be placed in such a broad ethnic category.

Dale, Jedidiah, University of Texas at Austin

*Remote Sensing of Burning Dynamics in the Domesticated Landscape of the Bolivian Amazon's Forest-Savanna Mosaic*

**Authors**

Jedidiah Dale Clark Erickson Timothy Beach

**Abstract**

Anthropogenic fire plays a critical role in the formation and function of many of Earth's ecosystems. Savanna-forest ecotones, such as those in the Bolivian Amazon, are gaining recognition as hot-spots of biodiversity. This diversity cannot be separated from the regions human past. The role of anthropogenic fire in the formation and maintenance of the savanna component of the Llanos de Moxos is debated based on paleo-environmental and archeological investigation. Analysis of current burning today can provide insight into how past fire may have functioned as a landscape management strategy, and how fire should be accounted for in current conservation plans. Multispectral imagery was used to map burn scars on the savanna for the years 1984 – 2017. The landscape was then analyzed for fire frequency and for spatial relationships between burning

and current human presence, topography, and vegetation. An abundance of frequent mid-sized fires was documented. These burns were concentrated near current ranches. Fire presence and morphology was found to be controlled by topography and human construction. Low fire frequency was also associated with transition to more heavily vegetated savanna. These results potentially point towards interpretations which maximize humans' significance in savanna formation and continuation. However further integration with modern flooding and vegetation data, as well as paleoclimate and historical records is needed to arrive at a fuller picture of past and present fire on the landscape.

Denvir, Audrey, University of Texas at Austin

*Demographic shifts of a microendemic tree species: The case of Quercus brandegeei in S. Baja California, Mexico*

### **Authors**

Audrey Denvir, Antonio Gonzalez-Rodriguez, Jeannine Cavender-Bares, Hernando Rodriguez Correa, Murphy Westwood

### **Abstract**

Background: *Quercus brandegeei* is a microendemic and highly restricted oak species found at the southern tip of the Baja California peninsula in Mexico. The species faces major ecological barriers to regeneration across its range, undermining the long-term viability of the species. *Q. brandegeei* serves as a case study of an endangered species that cannot be conserved through standard, one-size-fits-all conservation methods, but that instead requires context-specific information gained from scientifically robust research. Methods: In order to uncover the mechanism that is preventing wild regeneration of *Q. brandegeei*, this project integrates in situ and ex situ methods, including a population demographic study, greenhouse germination experiments, microsatellite analysis of population genetics, and ecological niche modeling. Results: Throughout the range of *Q. brandegeei*, population density is low and only large, mature trees can be found. As a result of long term climate change, this habitat is experiencing increasing drought and shifts in precipitation patterns that are limiting seedling recruitment. Ecological niche modeling shows that in the face of climate change, assisted migration may be necessary for species survival. Microsatellite analysis indicates provides evidence that the species still maintains high levels of genetic variation but has likely incurred recent demographic bottlenecks. Conclusions: The case of *Quercus brandegeei* demonstrates how protecting habitat does not automatically protect all biodiversity within those systems. For certain endangered species conservation efforts will require more focused consideration of the species-specific impacts of ecological constraints.

Eisenhart, Amelia, University of Texas at Austin

*Translating Perceptions of Environmental Change*

**Authors**

Amelia C. Eisenhart, University of Texas at Austin Kelley A. Crews, University of Texas at Austin

**Abstract**

Insight might often be lost in translation, but translation also has the potential to elucidate situational meanings and contexts. Language is subjective and its meaning is place-dependent, particularly in the case of a topic as ambiguous as environmental change. This study examined how similar translations of a concept might be interpreted differently based upon people's perceptions of a place. Residents of three villages along the western floodplain of the Okavango Delta were interviewed about their perceptions of change within the area and changes specifically in the flooding regime. The western floodplain exhibits high spatio-temporal variability in flooding patterns, meaning that flooding is often characterized as the dominant environmental factor. We examine perceptions of change based on what we call ambiguity of change – when a resident indicated that the floods had changed but the area had not, or vice versa. The ambiguity of change was evaluated based on village distance to the floodplain, whether a resident had resided only in one village, and whether they had moved to this area from outside the wetland floodplain. In each case, ambiguity of change was higher in those populations that had experienced an extreme change that affected their sense of place. Environmental changes are perceived and interpreted within context of where people have lived, how long they have lived in each location, and the characteristics of those locations. It is therefore necessary to evaluate not only current environments, but past environments present in the human memory, to produce a discussion of human-perceived landscape change.

Elledge, Annie, The University of Texas at Austin

*"Title NA"*

**Authors**

Annie Elledge (The University of Texas at Austin) and Caroline Faria (The University of Texas at Austin)

**Abstract**

N/A



Enwright, Nicholas, Louisiana State University

*Advancing barrier island habitat mapping through the treatment of elevation uncertainty and morphology*

### **Authors**

Lei Wang, Louisiana State University, Department of Geography and Anthropology, Baton Rouge, LA Sinéad Borchert, Cherokee Nation Technologies at U.S. Geological Survey, Wetland Aquatic Research Center Richard Day, U.S. Geological Survey, Wetland and Aquatic Research Center, Lafayette, LA Laura Feher, U.S. Geological Survey, Wetland and Aquatic Research Center, Lafayette, LA Michael Osland, U.S. Geological Survey, Wetland and Aquatic Research Center, Lafayette, LA

### **Abstract**

Barrier islands are dynamic ecosystems due to their position at the land-sea interface. Storms, waves, tides, and currents are powerful forces that shape barrier island morphology and regulate habitats. Coastal managers are concerned with monitoring these dynamic islands since they provide many important ecosystem services including storm protection and erosion control to the mainland, habitat for fish and wildlife, and tourism. In this study, we reviewed barrier island-specific habitat mapping efforts and highlighted common habitat class types, source data, and mapping approaches. We found that researchers often develop custom habitat maps for barrier island monitoring due to several factors including island size and the classification of unique geomorphology-based habitats such as beach, dune, and barrier flats. We also developed a framework for mapping geomorphology-based barrier island habitats using a rule-based geographic object-based image analysis approach, which included field data, tide gauge data, orthophotography, and lidar data. Researchers sometimes use lidar data for automated extraction of geomorphic and ecologic features such as dune and intertidal marsh; however, lidar uncertainty can limit the accuracy and repeatability of these techniques, particularly in low-relief coastal areas. To address this issue, we included landscape position information for automated dune extraction and Monte Carlo analyses for the treatment of elevation uncertainty into the mapping framework. We found that dune extraction results were enhanced when elevation relative to storm water levels and visual interpretation were also applied. This framework could also be applied to mapping coastal beach-dune systems found along a mainland.

Eshleman, Sara, University of Texas at Austin

*The influence of topographic factors on vegetation height in northwestern Belize*

**Authors**

Sara Eshleman, The University of Texas at Austin Timothy Beach, The University of Texas at Austin Eugenio Arima, The University of Texas at Austin

**Abstract**

In most environments, inter-related biotic and abiotic factors influence vegetation composition and distribution. Over large geographic scales, climate is considered the most important driver of vegetation patterns, but other factors dominate at local scales. Locally, topographic characteristics are important contributors to vegetation composition and distribution. Topography also interacts with hydrology and soil, among other factors, to further contribute to vegetation spatial patterns. In Belize, ecological studies since the early 20th century emphasize a strong relationship between vegetation and topography – with higher canopies existing on slopes and at high elevations, and the lowest vegetation occurring in low-lying, flat areas. At the same time, this correlation has rarely been empirically tested. Here, we test and lend additional data to these long-held hypotheses about the vegetation-topography relationship in this region through the use of newly acquired lidar data. We specifically examine the interaction between canopy height and topography within the Rio Bravo Conservation Management Area (RBCMA) in northwestern Belize. Elevation, aspect, microtopography, and topographic position all influence canopy height in northwestern Belize, and in some instances the relationship varies based on the relative size of the canopy and the influence of the surrounding area. The vegetation-topography relationships indicate that high canopies are correlated with elevated, convex surfaces that are likely more well-drained, and on south-facing slopes. Together, vegetation height in northwestern Belize can be partially explained by topographic characteristics. The results aid in understanding the drivers of vegetation distribution in this region.

Faria, Caroline, UT Austin

*A long way to go: Collective paths to racial justice in geography*

**Authors**

Caroline Faria, Bisola Falola, Jane Henderson, Rebecca Torres

**Abstract**

Despite decades of recognition and worry, our discipline remains persistently white. That is, it is dominated by white bodies and it continues to conform to norms, practices and ideologies of whiteness. This is a loss. At best, it limits the possibilities and impact of our work as geographers. At worst, it continues to render the discipline, its working environments, institutions, and knowledge production, violent. This remains deeply concerning for many geographers, and there has been important research, commentary, and institutional activity over the years. Yet, research shows us little meaningful progress has been made. We know mentoring is one vital part of the journey towards change. As such we reflect here on our experience developing a research collective built on a transformative mentoring ethic. We outline the key challenges, strategies, and tentative successes of the collective in supporting women of color undergraduate, graduate and faculty geographers, arguing that such feminist formations are a vital part of the path to intellectual racial justice in our field.

Fenton, Monica, Louisiana State University

*Pots Marching Through Time: a clay-sourcing petrographic pilot study of ceramics from Sitio Conte, Panama, and evidence for local production versus long-distance trade*

#### **Abstract**

Artistic style of ceramic and gold artifacts is the traditional lens through which archaeologists have studied trade and long-distance cultural contact in 1st millennium AD Central Panama. Here, I conduct a pilot study to examine Pre-Columbian Panamanian ceramics with thin-section petrography and polarized light microscopy. The sample consists of three ware types from Burial 7 of the University of Pennsylvania's excavations at Sitio Conte, Coclé Province, in 1940. By sourcing the clay fabric against geological maps of Central Panama and the surrounding region, I investigate whether the plain ware, painted red ware, and polychrome ceramics are imports or of local manufacture. The results were equivocal, due to a lack of geological diversity in the region. The heterogeneous set of fabric groups could have been derived from any widely-distributed parent rock type in Central Panama. This speaks to the limitations of a small sample size, as well as geological maps that generalize surface rock types over large areas, obscuring small variations that may influence clay composition. A reasonable next step for the project would be prospecting clay and rock samples from around the site to compare against the archaeological ceramics.

Foster, Cheryl, Louisiana State University

*Chemical Investigations of Natural Element Concentrations in Marine Sediment in Punta Ycacos Lagoon, Belize*

#### **Authors**

Cheryl M. Foster, Louisiana State University and Heather McKillop, Louisiana State University

## **Abstract**

This project seeks to discover the elemental composition of marine sediment below the sea floor in Punta Ycacos Lagoon to provide a baseline for comparisons with sediment chemistry at underwater archaeological sites elsewhere in the lagoon system. Soil science has been used in many scientific disciplines for decades. However, chemical testing of soils in archaeological contexts in the Maya area is a relatively recent application. The chemical tests are useful for determining activity areas at archaeological sites, as humans alter the natural chemical properties of sediments. ICP-AES was used to test for elemental measurements in 15 sediment samples, and density maps were created for each to show individual element concentrations. The results produced were generally expected, showing that the area had little to no human activity throughout most of the site's history, but did indicate some areas for further inquiry and research.

Fry, Matthew, University of North Texas

*Social development projects and distributive justice in oil extraction regions*

## **Authors**

Matthew Fry, Department of Geography and the Environment, University of North Texas; Andrew Hilburn, Department of Social Sciences, Texas A&M International

## **Abstract**

People living in oil extraction areas often experience the bulk of negative effects, but rarely realize the financial benefits that accrue from hydrocarbons extracted from beneath their community. To reduce conflicts resulting from this disparity, international oil companies use social responsibility schemes and programs. For example, Petrol eos Mexicanos' (Pemex) community development programs aim to improve "the quality of life of families in oil regions" and enable those "communities to enjoy the benefits that the oil industry entails" (Pemex Sustainability Report 2016, p. 69). Contemporary scholars use post-structural critiques to contextualize the rise of these types of neoextractivism and neoliberal regulatory arrangements in Latin America, but few studies empirically measure social responsibility efforts. In this paper, we assess Pemex's social responsibility claims using an environmental justice framework to analyze the distribution of costs and benefits of hydrocarbon production among 114 rural communities in the Misantla-Tampico Basin. According to a distributional justice perspective, oil production is equitable if those who experience the greatest risks also receive the most social development benefits. To test for distributional justice among the 114 extractive communities, we compare presence of social development infrastructure (i.e. benefits) to presence of hydrocarbon infrastructure (i.e. costs), as well as to total hydrocarbon production, population count, and degree of marginalization.

Furness, Walter, Texas State University

*Situating food banks in the greater foodscape*

**Authors**

Walter W. Furness Eric R. Sarmiento

**Abstract**

Food banks are often-overlooked actors in the larger assemblages of urban and rural foodwebs. They occupy a hybrid space that is not a market in the traditional sense, but which relies on markets in part for its survival. These organizations are tasked with regenerating value in foods that have been devalued in mainstream capitalistic retail markets. Because they receive food from numerous and diverse sources, food banks exist in a state of hybridity—they are neither mere extensions of capitalistic markets nor are they simple oases for local food systems in need of distributional infrastructure. They are therefore a nuanced and multifaceted part of diverse economies that falls outside typical retail paradigms and which are contested in their goals, approaches, and operations. This paper explores food banks as spaces deserving further scrutiny in the greater regional foodscape. The aim of the paper is to determine how these spaces can be a durable part of more just and equitable food systems. This paper draws on ethnographic fieldwork conducted in Rockford, IL and Oklahoma City, OK with data from interviews and focus groups, with emphasis on their potential for “scaling up” alternative food networks. Results indicate the utility of enrolling a broader array of producers in supplying food banks, as well as cooperating on distribution and storage. Viewing food banks and food pantries as hybrid spaces helps us to ask different questions about economic viability and social justice rather than providing a silver bullet ‘solution’ for the challenges facing them.

Groll, SK, Louisiana State University

*Vanishing Care: spatial segregation of hospitals in Baton Rouge, LA*

**Abstract**

Building from an ethnographic and historical framework, this research examines the shifting locations of major healthcare facilities in Baton Rouge, LA. This paper connects past and present locations of hospitals to contemporary narratives of racial inequality and segregation in the city, speaking to the ways racism and classism continue to structure economic, health, and social outcomes.

Grondin, Nicholas, Louisiana State University

*Spatial and Temporal Characteristics of Tropical Cyclone Strikes along the Mexican Riviera*

**Authors**

Nicholas S. Grondin, Louisiana State University Barry D. Keim, Louisiana State University

## **Abstract**

Tropical cyclones (TCs) are among the most destructive meteorological phenomena in the world. Mexico's Pacific coast, the Mexican Riviera, borders one of the most prolific TC development regions in the world, the northeastern Pacific (NE Pac) basin. The Mexican Riviera is home to a growing population and cities engaged in a variety of economic activities, most prominently fishing, agriculture, and tourism. We analyze fifty-two (1966-2017) years of NE Pac TC strikes along the Mexican Riviera by applying track data from the National Hurricane Center's HURDAT2 and a TC size model to determine TC strikes along the Riviera. An average TC model is used, whereby tropical storms, hurricanes, and major hurricane strikes are determined for each location. These data are used to construct time series and return periods for each location. Results indicate varying patterns of strike frequency across the Riviera, with "hot spots" along the southwestern coast, the southern tip of Baja California Sur, and on Isla Socorro. Temporal variation of TC strikes shows that very active seasons in the basin, such as 1985 and 1992, did not necessarily yield a large percentage of storms striking these locations, while some less active seasons, such as 1995, yielded a much higher percentage of striking storms. These results have utility for coastal planning and for emergency managers in western and southern Mexico, in addition to providing an understanding of the risk each of these locations have to TC activity and how each location's vulnerability is changing with time.

Haberlie, Alex, Louisiana State University

*A Climatology of Quasi-linear Convective Systems in the U.S.*

## **Authors**

Alex M. Haberlie, Department of Geography and Anthropology, Louisiana State University, Baton Rouge, LA 70803 Walker S. Ashley, Department of Geographic and Atmospheric Sciences, Northern Illinois University, DeKalb, IL 60115 Jacob Strohm, Department of Geographic and Atmospheric Sciences, Northern Illinois University, DeKalb, IL 60115

## **Abstract**

This study determines the degree that quasi-linear convective systems (QLCSs) threaten humans and their assets by: 1) generating a climatology of QLCSs; and 2) determining the proportion of QLCSs that produce severe weather. U.S. composite reflectivity mosaics and machine learning techniques are used to identify QLCSs. The machine learning model is trained and validated using spatial and intensity information from thousands of manually-labeled QLCS and Non-QLCS events. Convective regions determined by the model to be QLCSs are used as geographic foci for spatiotemporal filtering of severe reports. This work discusses the utility of this approach for automated storm-mode classification in the context of severe weather occurrence, as well as the climatological results corresponding to the occurrence of severe and sub-severe QLCSs.

Haggerty, Kelly, Louisiana State University

*From Plate to Bin: Community Food Waste Management in New Orleans, Louisiana*

**Abstract**

Food waste management, as separate from general urban refuse, has operated on the grassroots level in New Orleans for the last few decades. Several local community organizations have expressed interest in expanding this activity to help alleviate socioecological inequalities through combatting food waste. These same organizations also support a decentralization of recycled food to promote “greening” the city or furthering environmentally conscious business choices. Their methods to do so vary, including library compost drop-offs for near-by residents, compost bin pick up from for-profit LLC organizations, and volunteer run food shares. This paper analyzes food waste management and techniques in New Orleans, Louisiana. Using data collected during the summer of 2018, I map the spatial food waste patterns from where food is coined as surplus (households, businesses, restaurants, cafes, etc.) to sites of reuse (compost, community kitchens, etc.) within the municipality. Through surveys, participant observation, and interviews, I document who is participating in food waste management, where they are managing food waste, and the incentives for waste disposers to get involved. The beginning stages of research on food waste management in New Orleans may expose how much food is rescued from landfills, and if the recycling of this food alleviates potential social and environmental harms.

Hartsell, Alisa, Texas State University

*Analysis of Undocumented Migrant’s Access to Legal Representation Using Immigration Court Records*

**Abstract**

The pathways for currently undocumented migrants to gain legal residency in the United States are narrow and complicated, and most commonly require the assistance of an immigration attorney. As undocumented migrants struggle to access immigration lawyers and legal educational resources while protections such as Deferred Action for Childhood Arrivals (DACA) and Temporary Protected Status (TPS) are under threat, more migrants are having hearings in Immigration Courts where they are not guaranteed representation. According to researchers, the best chance for migrants to gain permanent residency is to have legal representation. Past research has explored how legal representation in immigration court varies by an immigrants’ country of origin. However, there has been little spatial analysis on where migrants are legally represented in Immigration Courts. Utilizing Immigration Court records, this paper explores if there is a relationship between where undocumented migrants live and the rates of their legal representation. Moreover, do these relationships for migrants change when they are detained? This paper explores these relationships by using local indicators of spatial association created through GeoDa software.

Hatzis, Joshua, University of Oklahoma

*Development of an Environmentally-Driven Tornado Impacts Model*

## **Authors**

Joshua Hatzis, Jennifer Koch, Harold Brooks

## **Abstract**

In an average year, the US experiences nearly 1,200 tornadoes which cause a total of 70 fatalities. While the annual fatality rates have been decreasing since the 1920s, there is concern that they could start to rise again with increases in vulnerable populations and the potential impacts of climate change. We can assess the risk of tornado fatalities using the historical record; however, the rarity of tornadoes and the short period of record may not capture the true risk. One way around this problem is to simulate thousands of years' worth of tornadoes to get a broader picture of risk. Previous tornado risk models have distributed tornadoes randomly or used climatology to generate realistic tornado patterns on an annual (or longer) time scale. From an operational standpoint, it would be useful to have a model that distributes tornadoes on a daily time step to enable the forecasting of potential tornado impacts on a given day. We propose the development of one such model that distributes tornadoes using information about the favorability of the atmospheric environment for tornado development. We present an early version of our model using environmental data from the North American Regional Reanalysis over parts of the Central and Southern US during the period of 2008 – 2016. By forecasting potential tornado impacts on a daily time step, we hope to allow emergency managers to plan for high-risk days. Knowing the potential severity of an event could enable emergency managers to prioritize their resources and save lives.

Hilburn, Andrew, Texas A&M International University

*Empirical environmental justice research in hydrocarbon extraction areas: examining current approaches outside the U.S. using a Mexican case study*

## **Abstract**

Expansion of unconventional hydrocarbon development across the United States has led to increased focus on its public health and environmental costs through the lens of environmental justice. Approaches to assessing environmental justice range from the qualitative to quantitative, with the latter primarily using GIS models to determine some form of population marginalization in proximity to unconventional oil and gas wells. However, such approaches have yet to be applied outside of the US with both unconventional and conventional wells. In this study, we tested the applicability of GIS and mean difference-based measures of environmental justice of oil and gas wells in the Tampico-Misantla basin in eastern Mexico. Following similar methodological approaches used in US-based studies, we selected all active oil and gas wells in the study area, created 1km and 2.5km buffers around them, and compared (Student's and Welch's t and Mann-Whitney U) mean indices of social and economic marginalization of localities (the smallest Mexican census enumeration unit) inside and outside each respective buffer for 2010 and 2000. Additionally, we applied a field validation rubric in 114 sample communities to assess the meaning and validity of our results. The statistical results indicate that localities within the buffers have lower marginalization compared to those outside of them. Fieldwork data indicated the presence of corporate social responsibility (CSR) community development projects in areas where hydrocarbon extraction takes place. These statistical results largely paint a picture counter to those



of many existing oil and gas EJ studies that associate greater marginalization in proximity to hydrocarbon infrastructure. However, fieldwork experiences and land tenure policy analysis counter such a claim by balancing the statistical claims and CSR project presence by noting the environmental/public health risk, surface land tenure insecurity, and overall observable poverty across the study area. Ultimately, the entire results of this outside of the US example show that future quantitative EJ studies on hydrocarbon infrastructure can be enhanced by field validation and contextualizing the statistical results within their legal, economic, and land tenure situation.

Hodge, Joshua, Texas State University

*Hurricane Ike Storm Surge Sedimentation on Southeast Texas Gulf Coast Marshes: Variations in Sedimentation and Anthropogenic Impacts*

**Abstract**

This study investigates the spatial extent of the Hurricane Ike sediment deposit on coastal marshes at McFaddin National Wildlife Refuge in Southeast Texas. Fieldwork conducted in summer 2017 and summer 2018 involved digging shallow pits on four transects between Sabine Pass and High Island, Texas. Eight pit sites were established on the easternmost transect, and six pit sites each were established on the three westernmost transects. Preliminary results indicate that the Hurricane Ike sediment deposit has been found on all four transects, and that the deposits decrease in thickness at the pit sites located further landward along each transect. Additionally, there is evidence that sedimentation has been impacted by the presence of man-made levees on some of the transects. The goal of this study is to discover spatial variations of the Hurricane Ike storm surge sediment deposit in relation to the landfall location of Hurricane Ike. The findings of this study should provide improved understanding of the spatial relationship between storm surge sedimentation and storm surge heights, valuable knowledge about the sedimentary response of coastal marshes subject to storm surge deposition, and useful guidance to public policy aimed at combating the effects of sea level rise on coastal marshes along the northern Gulf of Mexico coastline.

Hoffman, Hanna, Sam Houston State University

*Resetting the Records: Quantifying the Hydrologic Impacts of Hurricane Harvey and Land Use Change in the Houston Metro Area*

**Authors**

Hanna Hoffman, Brooke Jennings, and Ross Guida

**Abstract**

Over the last 16 years, river basins in the rapidly-expanding Houston metro area have seen significant flood events, including: Hurricane Harvey (2017); 2016 Tax Day floods; 2015 Memorial Day floods; Hurricane Ike (2008); and Tropical Storm Allison (2001). To assess flood probabilities that relate to increased risk, annual gage data is ranked. Gage data from USGS was downloaded from 54 gage that had at least 15 consecutive uninterrupted years of peak flow measurements (ending in 2017). The larger basins contained in this analysis include: the Lower Trinity, San Jacinto, and Lower Brazos. The majority of the gages were located within the 4,600 mi<sup>2</sup> San Jacinto River Basin. To determine the impact of Hurricane Harvey, I ran pre- and post-Harvey flow frequency analyses using HEC-SSP 2.1.1 with a percent exceedance ranging from 0.2-99. Overall, Harvey was the flood of record for 31 of the 54 gauges I tested, with Harvey being responsible for increasing 100-year flood discharges between 3.3% and 290%. Finally, to assess longer time-scale runoff changes that could be associated with land use/land cover changes since 2001, we used PRISM climate data at 800-m resolution to determine precipitation by subwatershed within the San Jacinto River Basin. To assess changes, we looked at mean monthly and mean annual depth equivalent and compared these values to precipitation at 4 gages with consistent daily data. Lastly, while I thought the precipitation:runoff ratio would increase throughout the years due to urbanization, more daily gage data is necessary to identify clear patterns.

Howard, Sadie, Stephen F. Austin State University

*Collaboration between the Alabama-Coushatta Tribe of Texas and Stephen F. Austin State University*

### **Abstract**

GIS Internship; Collaboration between the Alabama-Coushatta Tribe of Texas and Stephen F. Austin State University Sadie Howard, Stephen F. Austin State University GIS is used by many local, state, and government entities to collect, store and manage geographic data. The Alabama-Coushatta Tribe of Texas in Livingston, Texas reached out to SFASU to start an internship program to begin exploring what GIS could do for them. The objectives of this internship were to search for existing data, develop contacts, collect data as needed with a GPS unit, and produce maps for tribal use. This allows the tribe to save time and money on future development projects by having an information database for themselves. We were able to gather data from online sources, Polk County 911 Addressing and the Appraisal office, and collect data using a Trimble TDC100 Handheld Data Collector. Using ESRI's ArcPro 2.1, I was able to produce different maps from the data collected and for various tribal projects along with instructing the tribe's Real Estate Officer on how to use ArcPro and begin organizing a geodatabase. We decided to developed a pilot project area on the reservation at the Lake Tombigbee Campgrounds collecting different features with the GPS unit and produce a map as the final product of the internship. Through this experience, I was able to be exposed to the Alabama-Coushatta culture as well as many different GIS professionals at Polk County. I learned how to collect field data and convert it into shapefiles, and produce maps for real world applications. Connecting tribal culture to the geography of the area allowed me to further my understanding of the different uses of GIS.

Ibáñez, Juana, LSU/UNO

*Using the Marksville culture as a Trans/CIS Window to the roles of Geography and Anthropology in Archaeological Interpretation*

**Abstract**

Louisiana has traditionally placed the disciplines of Anthropology and Geography in the same department. That interdisciplinary exposure enriches expectations and stimulates curiosity while focusing on individual projects. This paper presents research on a 2000-year old archaeological manifestation known as Marksville culture using both geographical and anthropological techniques to anticipate the directions that this research can be guided. These fields train us well for insightful analyses and management of those cultural resources. Coastal Marksville sites are of particular interest in this presentation.

Jonsson, Don, Austin Community College

*What happened to the Bolivar Peninsula in Texas after Hurricane Ike?*

**Abstract**

Hurricane Ike hit the Texas Gulf Coast on September 13, 2008. It was a peculiar hurricane. Hurricane Ike was rated as a strong Category 2 storm on the Saffir-Simpson Scale, but it generated the storm surge of a Category 5 hurricane. Needless to explain, many people were killed and many areas of Bolivar Peninsula were wiped out by a 20+ foot (6+ meter) storm surge that hit the peninsula similar to a tsunami. The human landscape of Bolivar Peninsula recovered higher and more mobile. The higher structures to escape raging storm surges and more mobile structures for quick evacuations. A significant issue that has not been resolved on Bolivar Peninsula since Hurricane Ike are the evacuation routes. The evacuation route to the south (west) is via ferry. The ferries stop operation due to the rough seas associated with approaching hurricanes. The evacuation route to the north (east) is via a highway that parallels the beach. The highway is quickly submerged by the surf associated with approaching hurricanes. These inadequate evacuation routes create a "death trap" for residents and visitors on Bolivar Peninsula.

Julian, Jason, Texas State University

*Stream Mitigation in Colorado: Demand, Supply, and Challenges*

**Authors**

Jason P. Julian, Texas State University Russell C. Weaver, Texas State University

## **Abstract**

Colorado is one of the fastest growing states in terms of both population and land development. These land use changes are impacting jurisdictional streams, and thus require compensatory stream mitigation via environmental enhancement or restoration. From geospatial analyses of permit data from U.S. Army Corps of Engineers (USACE), we found that there is currently demand for compensatory stream mitigation in 13 of the 89 HUC-8 watersheds across Colorado. Permanent riverine impacts from 2012-2017 requiring compensatory mitigation totaled 38,292 linear feet (LF). The highest demand is in north-central Colorado along the I-25 corridor, particularly around the Denver metropolitan area. The supply of stream mitigation credits falls well short of this demand. There has only been one approved stream mitigation bank in Colorado, supplying only 2,539 LF credits. Based on our analyses of future growth and development in Colorado, there will be relatively high demand for stream mitigation credits in the near-term, more than 17,000 LF over the next 5 years. While most of these impacts will be around Denver, some new areas of the state will experience high demand for stream mitigation, including northeastern Colorado along the I-76 corridor, west-central Colorado around Grand Junction, and along the I-25 corridor between Colorado Springs and Pueblo. Given USACE's stated preference for mitigation banks, the high demand for stream mitigation credits, and the short supply stream credits, there should be an active market for stream mitigation banks in Colorado. However, there are some key obstacles preventing this market from moving forward.

Kang, Katherina, University of North Texas

*Transfer of black carbon from leaf litter to soil and accumulation in an urban ecosystem*

## **Authors**

Katherina Kang Alexandra Ponette-González

## **Abstract**

Black carbon (BC) is a well-known continuum of products derived from the combustion of both biomass and fossil fuels. In particular, soot black carbon is the most condensed and refractory particulate in the spectrum, strongly resistant to natural degradation within soil environments. Urban and industrial soils act as a natural carbon sink, accumulating BC through wet and dry deposition. Underneath tree canopies, two specific pathways for BC transfer to soil are through leaf litter (BC adsorbed onto leaf waxes) and throughfall (BC in water that falls through tree canopies) deposition. A previous study quantified BC on leaves to determine their efficiency as a carbon trap and showed that urban trees capture a large amount of BC due to their high leaf area index. This suggests that soils below urban tree canopies may be hotspots for BC accumulation. The goal of this study is to quantify what proportion of tree-captured BC integrates within the soil profile. For this study, sampling will be conducted in the City of Denton, Texas, where soil samples will be collected from directly under and adjacent to the canopy of selected trees. Sample collection will be of a standardized depth of at least 20 cm and analyzed by intervals of 5 cm to quantify and identify patterns of BC along its horizontal and vertical distribution. In doing so, we aim to correlate BC soil concentrations with measurements of leaf BC litterfall and throughfall deposition

and determine what percentage of BC transferred to the soil surface successfully accumulates in the soil. While fine particulate matter in the air is known to have adverse effect on climate warming and human health, recent studies highlight the potential for BC within soil to act as an efficient filtration component and provide beneficial regulation and cycling of other urban pollutants within the urban ecosystem.

Khan, Farhana, Northwest Vista College

*Taghia-Ahansal River Profile, High Atlas Mountains, Morocco*

### **Authors**

Farhana Khan, Scott L. Walker, Marcella Palaferri

### **Abstract**

In May 2018, geographers from Northwest Vista College conducted a hydrologic investigation in Zawiya Ahansal in the High Atlas Mountains of Morocco. With collaboration of Atlas Cultural Foundation, we gathered spring discharge and river flow data on the Taghia-Ahansal River. This was only the second time this remote river has been assessed. We conducted a comparative analysis with a 2016 study of the same watershed. We found a 400% increase in flow at the headwaters spring, raising it from a 3rd magnitude to a 2nd magnitude spring. Twelve kilometers downstream the flow was 542% more than previously measured. We measured the Ahansal Spring, a channel spring, discharging at 4.05 m<sup>3</sup>/s (143.16 f<sup>3</sup>/s), suggesting that this main source of water could become a 1st order magnitude spring under certain conditions. Despite these data, climate change predictions suggest an overall decrease in precipitation in the area (14% by 2030), which can create challenges in sufficiency for irrigation and consumption for four ancient villages in the Zawiya Ahansal region. Training for residents in regular monitoring of discharge and flow could equip them for improved water resource management and alternatives during dry seasons.

Krupala, Katie, University of North Texas

*Green Entrepreneurialism and the Making of the Trinity River Corridor: The Intersection of Nature and Capital in Dallas, Texas*

### **Abstract**

This research focuses on the role of nature as the site of economic development and community revitalization within Dallas, Texas. Nature in this project is coupled with economic development in the Trinity River Corridor (TRC). This research examines how the City of Dallas capitalizes on nature, and how the narratives of development relate to the city's residents' visions for development in the neighborhoods along the TRC. To do this, the research explores the social and economic impacts on the historic, low-income neighborhood of Joppa. Since the adoption of neoliberalism, many cities have taken to integrating nature with capital accumulation to create a

sense of place. This has been closely tied to urban greening, or green “revitalization.” As part of curating this desired character, city governments are working to roll out plans to restore and renew neighborhoods using their natural landscapes through methods such as reforestation, the creation of parks, and commercial development. The City of Dallas expresses the need for this development through sustainable, environmentally friendly, or other ‘green’ language. These cities, deemed Entrepreneurial cities, are increasingly incorporating natural or green spaces into their development of character as part of their branding schemes. Such cities are working vigorously to incorporate nature into their development, demonstrating yet another way that nature is subsumed into the circuit of capital. This is creating untold impacts throughout the urban landscape and this research will create a better understanding of how these impacts affect the socio-economic wellbeing of city residents.

Kyle, Aubry, Louisiana State University

*City-Assisted Evacuation Planning in New Orleans: Cementing Sites for the Future?*

**Abstract**

This paper explores aspects of policy decisions, implications, and implementations of post-Hurricane Katrina (2005) planning in New Orleans. The 2006 Post-Katrina Emergency Management Reform Act established the expectation that mass evacuation support would be provided for people and pets in advance of anticipated catastrophic weather events. It stipulated that individuals and households lacking the means for self-evacuation, and those with special needs, would be provided the necessary support and assistance to evacuate. In response, in 2007, Orleans Parish developed the City-Assisted Evacuation Program. Among other things, the program established 17 evacuation pick-up points throughout New Orleans. I examine the siting of these 17 pick-up points. I look at the decision-making processes behind designating pick-up points using pre-Katrina transportation data. I then explore spatial implications of point designations at three scales: city, neighborhood, and individual household. This paper draws on a larger body of independent research involving extensive time spent at each of the 17 evacuation points, observing landscapes, and conducting over 200 household surveys and 20 qualitative interviews with residents in each evacuation point vicinity neighborhood. Findings include problems with evacuation point visibility, accessibility, walkability, and safety, as described by informants. These findings raise significant concerns over static evacuation point positioning in the city’s shifting landscapes. I argue that an improved City-Assisted Evacuation Program will require more attention to questions of mobility, flexibility, and public awareness of evacuation point locations to meet the needs of a growing and changing city continuing with its Post-Katrina recovery processes.

Lane, Maria, University of New Mexico

*Geography of Beer: the pedagogy of recruitment*

**Abstract**

In this paper, I will describe efforts at the University of New Mexico to improve department visibility and increase enrollments/majors through a new lower-division course focused on the geography of beer. The paper will present not only the strategic discussions involved in developing and proposing the course, but it will also report on the structure and pedagogy of the eventual offering. Conclusions will focus on lessons learned in the first two years and will offer advice to other geography courses considering whether specific courses or pedagogies could be used to help spur enrollments at the undergraduate level..

Lasode, Mayowa, Texas State University

*Micro-scale analysis of factors associated with flood risk casualties in Texas*

**Abstract**

This study seeks to identify the associated factors of flood casualties in Texas. It is aimed to support public health interventions during persistent and long flooding periods. The state of Texas has experienced devastating flood events in the recent times that posed high health risk to people, destroyed property worth billions of dollars, and rendered more than a million residents homeless. Studies that have examined the neighborhood and environmental factors of flood casualties are limited. Geographic information systems provide available tools to evaluate the level of exposure and vulnerability based on spatially derived and historical flood data. In addition, historical flood data can be used to show the association between flood risk factors and flood casualties. Knowing neighborhood characteristics can help predict risk level during unfavorable environmental condition. The result of this study will help urban planners, jurisdictional health department and stakeholders in envisaging preventive measures and in developing interventions programs that can reduce the impact of flood hazards on human health.

Lasode, Mayowa, Texas State University

*Allocating Flood Evacuation Shelters in Austin, Texas: A Multi-criteria Approach*

**Abstract**

This study seeks to identify potential sites for flood evacuation shelters in Austin, Texas. These Shelters will support public health interventions during persistent and long flooding periods. The state of Texas has experienced devastating flood events in the recent times that posed high health risk to people, destroyed properties worth billions of dollars, and rendered more than a million residents homeless. Many Scholars have conducted studies using location-allocation models for siting evacuation shelters. This study gathers ideas from past studies to apply the concept for the city of Austin. Geographic information systems provide available tools to evaluate the level of exposure and vulnerability and to perform suitability analyses to find the most suitable locations for evacuation shelters. The result of this study will help urban planners, jurisdictional health department and stakeholders in decision-making efforts and in sustainability enhancement, land use development, and flood hazard mitigation and management.

Latham, Sarah, Louisiana State University

*"Sir, I Cannot Entertain You": The Commodification of Authenticity and a South Louisiana Slavery Museum*

**Abstract**

In his article "Tourism in Ghana: The Representation of Slavery and the Return of the Black Diaspora,"(1996) Edward Bruner describes tourism as, "the commodification of social relations and experience." People from all over the country, and the world, travel to historic preservation sites in the U.S. every year, but in what ways is authenticity expected, represented, and commodified specifically at a site focused on the history of slavery? My research examines the ways in which tour guides at one of these sites specifically are held as artifacts of the museum. Through months of participant-observation and hours of interview and focus group recordings, I attempt to answer this question. Here I interrogate the relationships between black identity, tourism, memory and performativity.

Lavy, Brendan, The University of Texas Rio Grande Valley

*Chain tourism in post-disaster recovery*

**Authors**

Elyse Zavar, Department of Emergency Management and Disaster Science, University of North Texas  
Brendan Lavy, School of Earth, Environmental, and Marine Sciences, The University of Texas Rio Grande Valley  
Ron Hagelman, III, Department of Geography, Texas State University

**Abstract**

Hurricane Harvey, a Category 4 tropical cyclone, made landfall near Rockport, Texas, in late August 2017. Sustained winds, torrential rains, and widespread flooding along the Texas Gulf Coast from Corpus Christi to Houston claimed 68 lives and caused an estimated \$125 billion USD in damages. The small coastal communities of Rockport and neighboring Fulton received extensive damage. As part of their recovery process, the communities initiated a statewide marketing campaign to rebrand their post-disaster image in an effort to attract tourists. Post-disaster recovery research tends to focus on macroeconomic measures or business-owner decision-making. These approaches can be valuable; however, they are limited by their scales of analysis and often miss local-scale recovery patterns and the individual perceptions of tourists. The purpose of this research is to understand tourists' perceptions of the recovery process and their motivations to visit the area in light of Rockport-Fulton's rebranding initiative. We conducted semi-structured interviews with small business owners and tourists over the 2018 Fourth of July holiday week and analyzed interview transcripts using discourse analysis. We found tourists are pulled to the Rockport-Fulton area via strong social networks through a process we term chain tourism. Based on our findings, we discuss the chain tourist's role in the recovery of impacted locations and consider alternative strategies to large-scale rebranding after a disaster.



LeVine, Daniel, University of Texas at Austin

*Spatial analysis of citizen science data to identify conservation opportunities for blackland prairie remnants in Texas*

**Abstract**

The recent widespread adoption of citizen science represents a significant data source for the field of conservation biology. Many opportunities for the conservation of rare species and species assemblages arise from the plethora of data made available by sources such as iNaturalist, eBird, and MonarchWatch. However, inconsistencies arising from the spatial locations of citizen science data, such as biases towards large population centers, require further analyses to understand the implications of the uses of these data in conservation planning. This research identifies spatial patterns in citizen science data points across the blackland prairie ecoregion of Texas, an area home to remnants of the rarest prairie ecosystem in North America. Specifically, the occurrence of citizen science data in public and private lands are discerned and mapped across the ecoregion for three plant species representative of the blackland prairie region, 1 invasive grass, 1 native forb, and 1 native grass, respectively: King Ranch Bluestem (*Bothriochloa ischaemum* var. *songarica*), Canada Goldenrod (*Solidago canadensis*), and Silver Beard Grass (*Bothriochloa laguroides* var. *torreyana*). Additional attention is given to the influence of large population centers and roads on the abundance of available citizen science points. The findings suggest opportunities to target large gaps and inconsistencies in the seemingly vast datasets offered by citizen science repositories. This work provides valuable insight into the use of citizen science data for both public and private land conservation, especially important in a state with 97% privately-held land.

Liu, Cuiling, Louisiana State University

*Habitation Environment Suitability and Population Density Patterns in China: A Regionalization Approach*

**Authors**

Cuiling Liu, Fahui Wang, Yaping Xu.

**Abstract**

The stunning disparity in population density between the southeast and northwest in China is highlighted by the “Hu Line”, a famous population demarcation line proposed by Huanyong Hu in 1935. This research seeks to uncover the underlying physical environmental factors that shape such a contrast. Specifically, we propose a habitation environment suitability index (HESI) model to integrate topographic factors, climatic suitability, and hydrological condition into one comprehensive index, and then use a GIS-automated regionalization method termed REDCAP (Regionalization with Dynamically Constrained Agglomerative Clustering and Partitioning) to derive two demarcation lines based on the HESI and population density values, respectively. The two delineation lines that divide China into two regions are largely consistent with each other. The

result indicates that the population distribution disparity between the southeast and northwest is largely attributable to the difference in physical environments, and the barrier defined by the Hu Line is here to stay. In addition, the research also explores the (in)consistency between population density and HESI distribution patterns in various regions.

Loder, Thomas, Texas A&M University

*Homo Dakoticus: Fracking Citizenship in North Dakota*

**Abstract**

Theorists have recently argued that support for extractive regimes in particular regions is predicated on developing a sense of shared belonging or "energy citizenship" among the local populace. In his work on the Alberta Oil Sands, Randolph Haluza-Delay has argued that there are multiple variations of energy citizenship, each one tailored to the political, economic and cultural milieu in different extractive locales (i.e., a Homo Alberticus identity for Oil Sands residents). In applying this theory to hydraulic fracturing (fracking) in the Bakken Shale, this paper proposes a specific form of North Dakota-centric energy citizenship, Homo Dakoticus. This paper will argue that the Homo Dakoticus identity is used to paint fracking as natural, inevitable and desirable for North Dakota and its people.

Luce, Brett, University of North Texas

*Variability of PM2.5 in an urban environment: Hotspots or hot moments?*

Brett W. Luce Tate E. Barrett Alexandra G. Ponette-González

**Abstract**

Urban cyclists are exposed to elevated atmospheric concentrations of fine particulate matter (PM2.5) which vary over time and space. Urban sources of PM2.5 include vehicle exhaust, emitted directly into cyclists' breathing zone. Human exposure to PM2.5 is a concern because it penetrates the lungs, leading to respiratory illness. The aim of this research is to measure and map PM2.5 hotspots and hot moments from the perspective of an urban cyclist, within the City of Denton, Texas, a rapidly growing urban area located in the Dallas-Fort Worth metroplex. A bicycle equipped with a low-cost, portable particle counter coupled with a Trimble Global Positioning System and a GoPro video camera were used to measure and map PM2.5 concentrations along four predetermined routes during morning rush hour. Routes connecting the University of North Texas campus to areas of high student populations including roads with bike lanes were selected. Throughout the study, 49 days were sampled during morning rush hour and over 700 km were cycled. Results indicate variability in PM2.5 concentrations with average concentrations ranging from 5.35 micrograms/meter<sup>3</sup> to 27.60 micrograms/meter<sup>3</sup>. Cyclists experience areas with

consistently elevated PM2.5 concentrations (hotspots) and areas with temporarily elevated concentrations of PM2.5 (hot moments), which are  $\geq 50\%$  higher than background concentrations. Stationary monitors within the City of Denton provide an estimate of average PM2.5 concentration for the city as a whole, but cannot capture the spatial and temporal variability in PM2.5. Improved monitoring networks across urban landscapes will allow for better understanding of this intra-urban variability.

Magrane, Eric, New Mexico State University

*Climate Narratives, Climate Geopoetics*

**Abstract**

Climate change can be considered as much a cultural and social issue as a scientific issue. Multiple narratives of climate change exist: for example, some see it as an existential and apocalyptic threat to life on earth or a national security issue; others see it as a social and environmental justice issue and a crisis of capitalism; others see it as a hoax and a ‘Trojan Horse’ for unnecessary regulations. In this presentation, I will address some of these climate narratives and share examples from a new series of poems on which I am currently at work. Each poem takes as its title a quote on climate change. The quotes/titles represent a variety of voices on the issue, from scientific to literary to social theoretical to spiritual to political. The resulting poems take a variety of tones, from matter-of-fact, to hopeful, to outraged, to despairing, to sarcastic/satirical, to combative, to lyric meditation. The form of this climate geopoetics project allows me to merge my (geo)poetic practice with my cultural and critical geographic research on environmental and climate narratives.

Mahar, Mark, University of Central Arkansas

*The Issues of Tracking Parishioners: A Case Study of Arkansas Catholics*

**Abstract**

Tracking the movement of peoples across time is a very common topic of study among historical geographers. Understanding where people are going, why they are going, and where they are coming from can help researchers further understand many complicated human issues. In an effort to understand some of the reasons people move from parish to parish, as well as move away from the Catholic church entirely, population data from different parishes around Central Arkansas was compiled and analyzed as part of this project. The data was analyzed in hopes to identify patterns of movement of parishioners away from, to, or between parishes, as well as identify possible events or scenarios that lead to parishioner movement. Researching the movement of Catholics in Central Arkansas proved to be difficult, as most of the various parish records are either non-existent or incomplete. This presentation will discuss the patterns of movement seen in Central Arkansas Catholic churches as well as a few of the observed “smoking gun” events that can lead to parishioner movement. The presentation will also discuss many of the issues, and the strategies used to overcome them in an attempt to accurately describe this movement. The information

provided in this presentation will prove valuable to future researchers, it will show what events to keep an eye out for when studying parishioner movement, as well as how to overcome some of the data collection issues.

Maleki, Shadi, Texas State University

*Mapping the Change in Spatial Distribution of Tweets on the Day of Hurricane Hervey: A Visual Approach*

**Authors**

Shadi, Maleki, Texas State University Milad, Mohammadalizadehkorde, Texas State University

**Abstract**

Previous studies showed that people in times of crisis tend to tweet about their situation to ask for help or to let their family and friends know that they are safe. Analyzing tweeting activity revealed to be of great importance for helping communities to better prepare for future disasters. Before jumping to study the content of tweets, this study examines how the number and spatial distribution of tweets changed on the day of Hurricane Harvey occurrence, in Houston, Texas. For this purpose, this study analyzed the change in tweeting activity between the Friday of Hurricane Harvey and a typical Friday before the event. Only geotagged tweets were used, and the methodological approach included aggregation to a hexagonal grid, calculation of the average tweet counts on a typical Friday, normalization of the results based on the mean and median, and representation of the confidence level of the results. The findings indicated to a general decrease in tweeting activity on the day of Hurricane Harvey occurrence with most of the tweeting concentrated in the city of Houston and few towns around it.

Manning, Aspen, Texas State University

*What is a river?: Riparian vegetation as an indicator of stream channel presence and connectivity in arid environments*

**Authors**

Aspen Manning, Jason P. Julian

**Abstract**

Stream channels in the American Southwest are misunderstood because they have been understudied and overgeneralized. This misunderstanding has serious consequences for environmental policy, particularly which arid stream channels are regulated under the Clean Water Act. Under current legal interpretation, jurisdictional waters must have a physical, chemical, or biological connection to downstream traditional navigable waters. The lack of consistent flow in arid stream channels can cause misinterpretations of physio-chemical indicators that are commonly

used in perennial streams of humid environments. Here we overview the use of riparian vegetation as a biological indicator of stream channel presence and connectivity in arid environments. Based on a thorough literature review and synthesis of arid region studies, we found key spatiotemporal patterns of arid riparian vegetation that could potentially be used to determine hydrologic connectivity. Much of the riparian vegetation along arid streams differs from riparian forests along humid streams in that it is better adapted to water scarcity and varies in response to differences in geomorphology, hydrology, and land use across multiple scales. Riparian vegetation in desert environments ranges from hydro- to xeroriparian and can include, or be made up exclusively, of upland obligate species. Regardless of species type, plants near streams tend to be denser and larger than upland plants. Access to more frequent flows and/or shallow groundwater results in denser, larger plants and more water-dependent species. By understanding the spatiotemporal variability of riparian vegetation along arid stream channels, we can make better decisions on their regulation and management.

Marden, Alexander, University of Texas at Austin

*Multi-scale analyses of spatiotemporal fire/vegetation dynamics in a savanna system with geographically weighted regression, Moran's I, and in situ vegetation measurements*

### **Authors**

Alexander Marden Kelley A Crews Thoralf Meyer Thomas Christiansen

### **Abstract**

The spatiotemporal interactions and feedbacks of fire and vegetation in savanna systems are a key component of savanna vegetation structure, function, and woody plant encroachment. The increased availability of coarse scale data for fire analysis means that integrated savanna assessments can be facilitated for local-to-regional analyses and management. This study assesses multiscale spatiotemporal fire dynamics in the Botswana Kalahari to contextualize local (field level) fire/vegetation dynamics within patterns observed at multiple regional scales using MODIS burn products (MCD45A1). Regional spatiotemporal analysis explored 1) the spatial autocorrelation of fire return over time using a bivariate Moran's I analysis and 2) the long-term drivers of fire occurrence over space using Geographically Weighted Regression or GWR. In situ species and structural grass and woody vegetation characteristics were measured and combined with MODIS fire history data to model local grass/woody biomass relationships with fire and grazing using OLS regression. Fire intensity and post-fire vegetation mortality assessments were performed on sites that burned approximately 2 months after initial measurements were recorded. Results indicate that 1) at the Botswana Kalahari scale, fire occurrence over time was heavily affected by neighboring pixels (first and second order), indicating influence of previous fires on fire return at

a coarse scale; 2) at the local scale, the relationship between fire occurrence and explanatory variables were highly spatially variable; and 3) a main limitation of coarse scale fire analyses for local applicability is spatial resolution (ex. 500m) that doesn't reflect key heterogeneous fine scale fire/vegetation interactions and feedbacks.

McCurley, Christopher, Louisiana State University

*Examining the (RE)Alignment of K-12 Geography Education in America: During the Cold War*

**Abstract**

Throughout history, geography educators continuously examine curricular positionality, by responding to the social changes, economic tensions, and political agenda that infiltrated all aspects of American Society. The purpose of this study is to examine the historical aspects of society that affect the development and positionality of secondary geography education during the Cold War Era. This research employs theoretical triangulation as the broad methodological framework and draws upon educational practitioners, historians, and social scientists to elicit geography curriculum positionality and change throughout the Cold War. Results of this systematic synthesis determined that two emerging themes affect K-12 geography education development: societal influences and educational institutions. Furthermore, geography education as a social studies course remains marginalized. However, education reforms and geography curriculum realignments indicate that geography as a discipline possesses the capability to respond and adapt to educational demands and changing needs of American society.

McDaniel, Lillian, University of Central Arkansas

*Fire history of an unlogged shortleaf pine forest in the Ouachita Mountains, Arkansas*

**Authors**

Lillian McDaniel, William Flatley, Cathleen McNutt, Alexander Russell

**Abstract**

Shortleaf pine-bluestem ecosystems are a fire adapted vegetation community in the Ouachita Mountains that has declined drastically since fire suppression started in the 1930s. Managers recently began carrying out prescribed burning treatments with the goal of using fire to restore this important habitat. However, little is known about the historical fire regime in the Ouachita Mountains and managers lack site-specific information to guide prescribed burns. Our objective was to characterize the historical fire regime, specifically frequency and seasonality; and to understand how the fire regime changed through the following land use periods: pre-EuroAmerican settlement (pre-1840), post-EuroAmerican settlement (1840-1930), and fire protection (post-1930). We sampled in the Lake Winona Research Natural Area, an unlogged

shortleaf pine forest in the eastern Ouachita Mountains of Arkansas. We collected, processed, and crossdated 23 fire-scarred cross sections in order to identify historical fire years. Our samples spanned the years 1562 to 2018 and fires were identified during both the pre- and post-EuroAmerican settlement periods. Fires were most frequent during the post-EuroAmerican settlement period. The majority of fires occurred during the dormant season indicating that they burned in the late fall, winter, or early spring and suggesting that ignitions may have been anthropogenic in origin. There have been no fires recorded at the site during the recent 90-year fire protection period. This project provides site-specific data to help guide the re-introduction of fire to the Ouachita Mountain landscape and help perpetuate shortleaf pine-bluestem ecosystems.

McDonald, Darrel, Stephen F. Austin State University

*The Oleander City Ethos: Perspectives on an Apparent Shift of Identity for Galveston Island, Texas*

### **Authors**

Darrel McDonald\* Sadie Howard

### **Abstract**

Since the late 19th century, Galveston, Texas has used the oleander (*Nerium oleander* L.) as a symbol for the city. The plant's rise to prominence dates from the 1840s when it was introduced to the urban landscape and proved to be well-suited to the harsh conditions of a barrier island. Over the decades, the oleander was a favored landscape shrub to complete street plantings of mainly Live Oaks and Washingtonia palms selected by citizens to create a tropical-like veil in the city. This favored status persisted after the 1900 storm when support for the oleander was championed by the Women's Health Protective Association, later to become the Women's Civic League in post storm beautification projects. Throughout the 20th century, oleanders remained a noted and noticeable plant across the city; found in all neighborhoods, regardless of economic status. A surge in recognition arose from the establishment of the Oleander Society, currently the International Oleander Society, in 1967. In the 21st century Hurricane Ike and more recently Harvey have required another round of re-vegetation initiatives with less emphasis on oleanders as a major theme in Galveston's identity. This paper will offer that gardening preferences, political positions and changing dynamics in social causes are impacting the role of oleanders in Galveston's identity.

McGregor, Kent, University of North Texas

*Reconstruction of Hurricanes Florence and Harvey with NOAA's Reanalysis Model.*

### **Abstract**

In 2018, Hurricane Florence made landfall in the Carolinas. She dropped 40 inches of rain and the resultant flooding was perhaps the worst in modern history. In 2017, Hurricane Harvey devastated the Texas Coast with up to 50 inches of rain and caused catastrophic flooding in the Houston. The

atmospheric environment of these hurricanes can be reconstructed with data from the reanalysis model. “Reanalysis” is a comprehensive, global atmospheric data set produced by the National Centers for Environmental Prediction. Thus, reanalysis is a tool by which the meteorological process operating in these hurricanes may be examined both before and after landfall. In addition, the surrounding pressure gradients and winds that guide the hurricane along its track can also be explored. The results indicated that Florence had a conventional guidance structure moving westward along the southern edge of a high pressure cell before making a northern turn toward Kentucky. In contrast Hurricane Harvey displayed a noticeable lack of atmospheric guidance showing little movement as the precipitation totals went off the chart. In both cases high pressure cells controlled the storm’s movement and track.

Mehaffie, G. Jade, Student at Sam Houston State University

### *Are Ancient Forms of Farming and Irrigation Sustainable for Today's Societal Needs?*

#### **Abstract**

The purpose of this project is to find if ancient forms of farming and irrigation can be sustainable in practice for today’s societal needs. The sample area considered for this thesis was Waipi’o Valley, the largest of six valleys of the Kohala Mountains on the Hamakua Coast located on the Big Island of Hawaii. The methods used to collect data were the classroom based study of watershed and watershed management techniques of the seven major Hawaiian Islands, study of invasive species of plant and animal- including their arrival on the islands and what, if any detrimental effects they have on the delicate island ecosystems, studying 8 distinct biomes of the Big Island, as well as learning the diverse cultural makeup. Data collected in the field included interviewing the population to better understand the lifestyle and needs of the people, sampling forms of traditional taro-based dishes produced by local taro farming methods, traveling to Waipi’o Valley to observe and work first hand in an existing taro patch producing a regular and substantial harvest. The societal needs in this case shall be defined as 1) revitalize, perpetuate, and advance Hawaiian Culture 2) provide fresh local produce for a portion of the communities of the surrounding areas 3) provide widespread community based education to ensure the propagation of natural resources for future generations. In conclusion, local students learn irrigation and farming practices dating to 800-1200 A.D. still currently in use to revitalize a historically staple crop to supplement the public school food system.

Melcher, Sarah, University of Oklahoma

### *Barriers to Recycling in Rural Oklahoma*

#### **Abstract**

In order to investigate barriers to rural recycling, I spoke with three city managers and two recycling industry professionals. I asked them about the challenges they faced when implementing and maintaining recycling programs in rural communities. After each interview, I analyzed their responses for commonalities, frequently mentioned themes, and unusual or surprising responses.



The list of barriers consists of items as diverse as wind, ideological resistance from older residents, and complex economic interactions. The barriers mentioned by the interviewees can be divided into three broad categories: Problems on an Individual Level, China + Uncertainty of the Future, and Logistics. More research is needed to comprehensively understand each barrier and to develop feasible solutions inside or outside of a traditional recycling framework.

Moore, Cayton, University of Oklahoma

*Moving the Mark: discourse mapping the Middle East through computer-assisted text analysis*

### **Abstract**

Though a common part of the American geographical imagination, the Middle East is not a clear-cut region or concept in reality. This study explores discourse surrounding the exertion of geopolitical power on the Middle East by examining four institutions (The United States Department of Defense, The North Atlantic Treaty Organization, The United Nations, and The World Bank) and how they define the Middle East in their news publications. By examining which states are included or excluded from analysis, it is possible to provide explanations for these regionalizations and ask how these conceptions might replicate and reinforce Orientalist geographic imagination. The paper utilizes discourse analysis through a relatively new method in the field of critical geopolitics- computer-assisted text analysis. Using Voyant Tools to explore a large corpus of publications allows for an exploratory approach to coding and discourse analysis. This method allows for a combination of close reading, as well as “distant reading”, which analyzes context and trends across a large corpus. Results found that boundaries of the Middle East differed little between the corpora, but issues that define the region varied significantly, creating different core and periphery states according to the publishing institution. For example, the UN frames the region around the Israeli-Palestinian conflict, while both military institutions emphasize active conflict zones, supporting that the Middle East is reduced to a unit of geographical analysis to provide context to these issues. This issue-based classification then recalls Orientalist imaginary geographies, which can inform and support regional hegemony by those same institutions.

Murphy, Blaise, University of Texas at Austin

*Agricultural Terrace Soils in the Andagua Valley, Southern Peruvian Andes*

### **Abstract**

Agricultural Terrace Soils in the Andagua Valley, Southern Peruvian Andes Blaise Murphy, University of Texas at Austin SWAAG Poster Abstract Soil is a globally diminishing resource that is especially vulnerable in sloped agricultural landscapes. In the Andes, as in other mountainous environments, indigenous communities constructed agricultural terraces for thousands of years as a technology that reduces slope gradient, increases soil depth and crop yield, decreases erosion and controls water flow. The Andagua Valley (3000-3200 m.a.s.l.), a semi-arid agricultural

community in the Central Volcanic Zone of the Southern Peruvian Andes, is an ideal locality in which to study terracing and soils as it contains a myriad of irrigated (and unirrigated) agricultural terraced slopes ranging in age. This research examines how the use, reconstruction and abandonment of agricultural terraces has influenced agriculturally relevant soil properties in the Andagua Valley. Using field and lab work, including soil sample collection, observations and analysis, this research addresses the following objectives: classify terrace morphology; test and classify physical and chemical soil properties from abandoned and cultivated terraces; and contextualize the spatial patterns of soil fertility and terrace preservation. Resulting data suggests little difference among tested chemical properties (pH, Electrical Conductivity, Organic Carbon and particle size) in abandoned and cultivated terraces, implying beneficial impacts of local land management practices persist after abandonment. Wall collapse and sheet erosion are visible on abandoned terraces, emphasizing the importance of continued management of uncultivated terraces. Principal conclusions from this research demonstrate that indigenous agricultural practices conserve the fertility of soil in agricultural terraces in the Andagua Valley and illustrate the importance of maintaining and preserving indigenous agricultural landscapes.

Nimoh, Suzanne, The University of Texas at Austin

*Fabricating the Nation: Retelling History through Remembering and Forgetting in Washington, DC*

### **Abstract**

The United States capital of Washington, DC is characterized by architectural memorialization. Monuments around the city glorify the nation's identity, guiding visitors' memories towards an imagined nationalist past and present, one that erases darker realities. In this paper I argue that Washington, DC presents itself monolithically, eliding its multilayered history. In particular I show how Black and Indigenous history and existence, and specifically their experiences of racial violence are discursively and materially erased. I do so by attending to the ecocide of the Anacostia River, and to the National Mall. The river is a material and symbolic life source for generations of Black and Indigenous residents. It also acts as a marker of racial segregation in present-day DC, with black residents who live east of the river experiencing environmental racism whilst their communities are being gentrified. Grounding my analysis in this river I ask, what parallels exist between the colonization of the Potomac Region and the current condition of the city? How has the manipulation of the built and natural environment of DC affected the nation's memory? How does the racialization of the river as a boundary contribute to discursive erasure of Indigenous and Black residents? To answer these questions I draw on a decolonial methodology, working with the elders of the Piscataway Conoy Tribe who the Nacotchtank descend from. I combine community based ethnography, oral history analysis and autoethnography, complementing this with an examination of local public records and oral histories from DC autoethnographic oral history collective "Anacostia Unmapped". My findings offer a comparison of necropolitical nation-making as experienced by indigenous and afro-descendent communities along the Anacostia River, and the expressions of this lethal nationalism in the present day.

Ochoa, Francisco, The University of Texas at Austin

*Validation of riparian evapotranspiration through remote sensing and eddy covariance systems in New Mexico*

**Authors**

Francisco Ochoa (UT Austin) Dr. Thomas Schmugge (NMSU) Dr. Kelley A. Crews-Meyer (UT Austin)

**Abstract**

The Rio Grande is often described as one of the “lifelines” of different regions of the American Southwest. Situated along the Rio Grande in New Mexico are riparian areas with vegetation that is connected to both surface and groundwater. These riparian areas along the Rio Grande serve as habitats to endangered species, therefore, management of these areas require the full understanding of the hydrological cycle. By fully understanding the water cycle and the amount of energy available in these riparian systems, managers and decision makers can manage these ecosystems that represents the natural phenological cycle and benefits wildlife. To close the hydrological cycle, a quantification of evapotranspiration (ET) is needed in riparian areas. Multiple national and global ET models have been developed by various governmental agencies, but they fail to pick the topographical and arid conditions of New Mexico. Landsat has a spatial resolution of 30 m as compared to the 250 m spatial resolution of MODIS, which allows it to capture the discontinuous nature of the riparian zones along the study area. This talk tests the validity of both the Nagler et al. (2013) method and the cubic regression for days on non-satellite coverage through linear comparisons and the standard of measurements during the growing season (April – October) from 1999 - 2011. Preliminary comparative results have indicated that this model has an asymptote of one, implying that ET will never be greater than the reference evapotranspiration (ET<sub>o</sub>), indicating potential underestimations of ET with implications for both research and management.

Pedrick, Hayley, University of New Mexico

*Textures of Transition: Understanding Memorial Spaces in Medellin, Colombia*

**Abstract**

The role of symbolic reparation in transitional justice in Latin America is increasingly prominent at both local and international scales, ranging from recommendations outlined by the Inter-American court system to the state-funded construction of monuments in rural communities. In Colombia, visual representation of, by, and for victims of civil conflict holds multiple functions: acknowledging or revealing injustice, providing a space for mourning or consolation, inviting reflection, celebrating the present and/or transmitting current political messages through depictions of the past. This paper discusses field research at four sites of civil war and victim commemoration within and surrounding Medellin, Colombia, presenting results from field notes and semi-structured interviews with scholars and professionals in memory institutions that range from informal and community-based efforts to state-funded initiatives. The paper focuses on

commemorative practices and related institutions in Latin America, giving particular attention to spatial relationships by first, analyzing the use of text and image within the sites and second, exploring the historical backgrounds of the memorial sites themselves. With the goals of interpreting and describing recent processes of material commemorative practices in Medellin, the paper argues that a spatial reading of contemporary memorials in Medellin serves as a tool for understanding the complex challenges Colombia faces in transition towards peace.

Peppler, Randy University of Oklahoma

*An Inexhaustible Discourse: Oklahoma's Oil and Gas Industry Public Relations Campaign*

**Abstract**

“Our mission -- to use the strength of Oklahoma’s greatest industry to improve the lives of all Oklahomans through education and restoration...Our positive impact is seen not only in restored pastures, hillsides and ponds, but also on the faces of landowners, students and teachers across the state.” These are some of the “About Us” words on the Oklahoma Energy Resources Board (OERB) website (oerb.com). OERB was formed in 1993 by representatives of Oklahoma's oil producers and royalty owners (later joined by the state’s natural gas producers) along with the State Legislature to restore Oklahoma's orphaned and abandoned well sites. Over the years, OERB and the industry have crafted and sustained a powerful discourse to curry public favor by going well beyond the initial charge of abandoned wellsite restoration. This expansion includes a glossy website and its offshoots (e.g., EnergyHQ.com), a series of promotional television spots, and an expansive earth science (i.e., oil and gas) curriculum for K-12 education. Washing its various signifying practices in patriotic and tough-minded themes of energy independence that promote an “inexhaustible” resource, OERB and the industry have created an inexhaustible public discourse that is largely accepted as true and unquestioned, one that discourages dissent and downplays or ignores the role of the state’s burgeoning wind energy enterprise. This presentation will show some various signifying practices used by OERB and others in the industry to promote the concept of energy independence, building a narrative extolling the virtues of the industry, all underpinned by the ideology that oil and gas is “the only way”.

Pinon, Andrea, Texas State University

*Gorillas are agents of landscape formation and decay: An analysis of non-human primate literature through the lens of Zoogeomorphology*

**Authors**

Andrea Pinon, Texas State University David R. Butler, Texas State University

**Abstract**

Gorillas exert an exceptional degree of influence on their physical environments, most notably, their role as keystone species in forest regeneration via endozoochory dispersal mechanisms.

Primate research tends towards an ecological perspective with less emphasis on the geomorphic implications of great apes on the landscape. Zoogeomorphology, the study of animals as geomorphic agents, provides an avenue to further explore the role of gorillas in earth surface processes. This study is a descriptive and content analysis of non-human primate literature through the lens of Zoogeomorphology to identify, categorize, and define cases of gorilla zoogeomorphic activity. Works published in print or online between 1963 and 2016 in twenty-nine journals, four books, and seven organization webpages were exhaustively mined to capture the greatest extent of qualitative and quantitative data possible. Descriptive statistics were used to interpret aggregate data for both sets of variables. Furthermore, key Zoogeomorphology studies with an emphasis on megafauna were used to extrapolate potential trace specific geomorphic response(s). Results reveal nine categories of gorilla zoogeomorphic activity and include: (1) soil scratching (with hands) and (2) soil scraping (with incisors) of the forest floor; (3) excavating chambers and depressions; (4) bare/semi-bare soil nest sites; (5) hand/knuckle and foot prints; (6) excavating insect mounds; (7) bioturbating effects of tool use (8) trunk uprooting, and (9) trampling. Eight of these categories were represented within quantitative data sets and all nine categories, in qualitative analysis. Soil nest sites were most quantified whereas insect mound excavation made up most qualitative observations within the literature.

Pitre, Claire, University of North Texas

### *Bird Feathers as Biomonitors of Soot Pollution*

#### **Authors**

Claire Pitre, Anna Lee, Alexandra G. Ponette-González, Dornith Doherty, Jeff A. Johnson, Matthew Fry

#### **Abstract**

Black carbon, commonly known as soot, is a component of particle pollution. The emission of black carbon into the atmosphere is one of the main contributors to anthropogenic global warming and has adverse effects on air quality. Birds have been used as biomonitors of atmospheric pollution via the collection and measurement of pollutants that have accumulated in bird feathers, muscle tissue, urine, and preen oil. Bird feathers, specifically, can be used as non-destructive biomonitors because already-moulted feathers can be analyzed. In previous studies, bird feathers have been used to track bioaccumulation (the internal concentration of substances ingested by an organism) of pollutants, but most have not been concerned with external accumulation of airborne pollutants on bird feathers. When external contamination in feathers is addressed, generally the goal is to not quantify it but remove it from feather surfaces, to more clearly investigate internal concentration. External contamination of bird feathers can occur directly from airborne pollutants, water, or during the process of preening. In this study, different types of bird feathers will be collected and tested for their capacity to externally accumulate black carbon particles. Moulted body-, wing-, and tail chicken feathers will be collected and washed with distilled water and the extracted material will be analyzed to determine which feather types accumulate the most soot.

This research represents a critical first step to determine how bird feathers can be best used for monitoring atmospheric black carbon pollution.

Plassin, Sophie, University of Oklahoma

*A Spatial, Socio-Environmental database for the transboundary Rio Grande/Río Bravo basin*

### **Authors**

Sophie Plassin, University of Oklahoma Jennifer Koch, University of Oklahoma Stephanie Paladino, MeroLek Anthropology Jack R. Friedman, University of Oklahoma Kellie B. Vaché, Oregon State University

### **Abstract**

Transboundary river basins represent 60% of freshwater supply basins and almost 50% of the total land area of the Earth. United Nations – Water has acknowledged that data and information sharing is a way to foster transboundary cooperation and, ultimately, achieve more sustainable water management, and maintain peace and security. However, integrating a broad range of datasets from multiple disciplines and countries is challenging due to the inconsistencies in format, type of available information, languages, and disparity of data sources. Here, we introduce a spatial, socio-environmental database created for the transboundary Rio Grande/Río Bravo basin (RGB). We identified and collected 37 types of datasets based on extensive field research conducted by environmental anthropologists and interdisciplinary collaboration among natural and social sciences. Secondary data were collected from public agencies or private institutions, and processed for the study area. As a result, 100 datasets corresponding to around 500 MB were aggregated in a geodatabase and organized into five themes: (i) water governance, (ii) hydrology, (iii) hydraulics and water use, (iv) biophysics, and (v) demography, economy, and infrastructure. This spatial database provides a comprehensive picture of the diversity of human and natural conditions in the RGB. Intended to be an open access and easily accessible resource, the spatial database is expected to support on-going research efforts in the basin. In this talk, we will present an overview of the geodatabase and examples of applications, including several mapping products and data analyses.

Purcell, Darren, University of Oklahoma

*Selling the South in Delta's Sky Magazine*

### **Authors**

Darren Purcell, Clayton Moore

### **Abstract**

Delta's Sky magazine claims to be an influential outlet for entities trying to promote places to investors and tourists. Claiming nearly 6 million readers monthly, the magazine's profiles of cities,

states and regions have the potential to reach the niche audiences that shape the spatial practices of firms, as well having disposable income to spend as tourists themselves. This paper explores how Sky promotes places in the text of these profiles through the dual use of digital humanities tools and close reading-based interpretation to address the follow questions. First, what themes are present in the profile texts, given that all places seek to address both unique elements while addressing common themes of importance to business? Second, we ask how is the South represented in the profiles? We find that place promotion in Sky consists of similar themes that have been identified in the literature since the 1980s, primarily accessibility. Efforts to attract the creative class are also present in the corpus. The South poses unique challenges to place marketers, and our findings show a convergence in how profiles tackle the concept of southern culture and identity as it is leveraged in many of the profiles, with some exceptions.

Raihan Jamil, Texas State University

*An Evaluation of the Utility of a Mass-Weighted Frequency Distribution of Sediment for Modeling Aeolian Transport Rates*

#### **Authors**

Raihan Jamil, Steven Namikas

#### **Abstract**

redictions made by aeolian transport models often do not match well with measured data. The poor predictive capability of these models remains a fundamental problem in aeolian geomorphology. This study evaluates the effectiveness of the recently proposed mass-weighted frequency distribution (Edwards and Namikas 2015) and the apparent von Kármán parameter proposed by Li et al. (2010) to improve transport rate predictions. The evaluation consists of comparisons of predicted transport rates versus a large dataset of measured field and lab transport rates collected from the literature. The transport rate predictions are made both with and without recalibration of model empirical coefficients. The mass-weighted frequency distribution produces a small but statistically significant degree of improvement in agreement between observed and predicted transport rates. The greatest increase in R-square value occurs with the Hsu (1971) model (from 0.485 to 0.564). The disparity in predictions between different models is also reduced significantly. Use of the apparent von Kármán parameter is found to be limited to a particular range of sediment transport rates ( $Q < 0.028$  kg/m/s). The apparent von Kármán parameter provides the largest degree of predictive improvement with the Kadib (1965) model.

Rainey, Steven, McNeese State University

*Floods and Dams on the Madeira River: A Ribeirinho Perspective*

**Authors**

Steven Rainey, McNeese State University, Maura Araujo-Rainey, Independent Geographer

**Abstract**

During the 2013-2014 wet season, the Madeira River watershed within the southwestern Amazon basin experienced historic flooding, with official river levels reaching 19.69 meters at the port city of Porto Velho in the Brazilian state of Rondônia. While the primary causes of the flooding were higher than normal precipitation in the headwaters of the watershed, many residents of flood-impacted communities placed at least part of the blame for the flood's impacts on two recently-constructed dams on the Upper Madeira River between Porto Velho and the Bolivian border, and on the recently-implemented Madeira River Waterway. This paper presents the results of fieldwork that took place in 2014, 2015, and 2018 in several small river communities located across the Madeira River from Porto Velho. The presentation will examine the impacts of the flood, as well as the alleged roles of the dams in exacerbating these impacts, through the use of personal observations, photographic evidence, interviews with residents, and a review of the scientific literature on Madeira River dynamics, including the potential influence of the dams and waterway on those dynamics.

Rains, Bradley, University of North Texas

*An Economic Spatial Optimization Analysis of Central Texas Lignite Coal Mining***Abstract**

The purpose of this research is to conduct an optimal overlay analysis of maps containing different production data to display the most economically viable location for a lignite coal mining operation in Central Texas. The fundamental categories taken into consideration are transportation, mineral availability, and land access. This overlay methodology includes the utilization of several data sources such as mineral data from the USGS, railroad data from TxDOT database, mine claim data from the Railroad Commission of Texas, and complete geological data of Texas from the United States Geological Survey. Each data type will be given a numerical weight that is determined by its significance in the proximity, transportation, and overall production value established by the company. A Geographic Information System (GIS) is the methodology and approach we used to sort and analyze the data. Processing the data requires the use of geo-processing tools within ArcMap. The data will then be part of an overlay analysis, each criterion labeled with their corresponding weight. By converting the regional data into a hotspot analysis map of the weighted criteria, a clear spatial distribution of data will be produced. This spatial distribution will display the most production efficient location by colored weight. This methodology can be applied to a wide variety of industries by adjusting the criteria and inputting different weights for each criterion.

Reinhart, Joshua, Texas Tech University



## *LiDAR Surface Slope Analysis Used for Geologic Mapping*

### **Authors**

Joshua Reinhart, Dr. Tim Walsh

### **Abstract**

Slope data derived from a LiDAR dataset was analyzed to create a geologic map based on erosion patterns. The research area is located in south east New Mexico in the western extent of the Guadalupe Mountain range. The strata found in this region are similar to that exposed along the eastern edge of the Guadalupe Mountains. This project focused on the western escarpment that is primarily in the Pinon Ranch Quadrangle. Background research over the study area was conducted and various digital maps were downloaded (topographic, geologic, etc.). The LiDAR bulk data was obtained from the OpenTopography web site and imported to an Arc GIS system. From this basic data elevation chloropleth maps and a 3-D TIN model were created and analyzed in order to better understand the area. With these maps Slope Class-Breaks of grouping by degrees of slope were then manually determined using topographic slope data compared to descriptions of local geology. A geologic map was then built using the class breaks as a proxy for formations and members. This highlighted the ridge line of the Rio Bonito Member which has the steepest slopes in the study area. A trip was then made to the study area to ground truth the multiple maps that were created in the lab. Field observations found that the initial LiDAR slope mapping hypothesis generally holds true. Other factors such as vegetation and drainage patterns were also evaluated as indicators of underlying geology that can be examined with LiDAR.

Richards, Derek, Louisiana State University

## *Bedload Sediment Transport and Depositional Patterns of Neck Cutoffs*

### **Authors**

Derek Richards, Louisiana State University, Department of Geography and Anthropology Kory Konsoer, Louisiana State University, Department of Geography and Anthropology Mick Ursic, USDA Agricultural Research Service, National Sedimentation Laboratory Jacob Ferguson, USDA Agricultural Research Service, National Sedimentation Laboratory

### **Abstract**

Neck cutoffs are prominent riverine features yet their sporadic and episodic nature has limited detailed, field-based research as the cutoff actively evolves. A combination of multi-beam echo sounder (MBES) bathymetric surveys, sediment cores, and grab samples were collected on two neck cutoffs to evaluate bedload sediment transport and patterns of sediment deposition within the active river channel and abandoned bend of the neck cutoffs. The cutoffs studied are actively evolving and have not plugged as quickly as previous research has shown for neck cutoffs, providing an excellent opportunity to research sediment distribution through these neck cutoffs. Cores taken from the abandoned loop indicate a depositional pattern of finer grain sizes since cutoff, typical of results seen in other studies. Mapping of median grain size indicate a general

trend of coarser grain sizes located on the cutoff bar in the downstream meander limb and finer grain sizes within the abandoned loop. Curiously, both the cores and median grain size distribution indicate a lack of silt and clay deposition. Results from the MBES repeat surveys show dune migration in the upstream meander limb leading into the cutoff. Estimates and bedload sediment transport rates were calculated and compared to results of other studies. Results from this research provide new insights into sediment distribution and depositional patterns for neck cutoffs that plug relatively slowly.

Rohli, Robert, Louisiana State University

### *Interannual Hydroclimatic Variability in Coastal Tanzania*

#### **Authors**

Robert V. Rohli, Sara A. Ates, Victor H. Rivera-Monroy, Michael J. Polito, Stephen R. Midway, Edward Castaneda-Moya, Arthur J. Gold, Emi Uchida, Mwita M. Mangora, and Suwa Makoto

#### **Abstract**

Climatic controls regulate the coupled natural and human systems in coastal Tanzania, where mangrove wetlands provide a wealth of ecosystem services to coastal communities. Previous research has explained the precipitation seasonality of eastern Africa in terms of the local monsoons. This research examines a wider range of hydroclimatic variables including evapotranspiration and runoff, and sources of low-frequency atmosphere-ocean variability that support mangrove productivity and associated ecosystem services. Results confirm that the northeast monsoon (kaskazi) largely corresponds to the “short rains” of October-December and extends through February, while the southeast monsoon (kusi) corresponds to the “long rains” of March-May and the drier June-September. The Indian Ocean Dipole (IOD) and El Niño-Southern Oscillation (ENSO) are important modulators not only of precipitation (as has been shown previously), but also of evapotranspiration and runoff. During kaskazi, positive (negative) hydroclimatic anomalies occur during positive (negative) IOD, with a stronger influence of the IOD during its positive phase. During kusi, the contrast between the positive and negative IOD modes is more subtle, and the pattern is dictated more by variability in “long rains” months than in the dry months. Because previous work suggests the likelihood of increased tendency for positive IOD and increased moisture variability associated with El Niño events in the future, wetter conditions may accompany the kaskazi with less change expected during the kusi. These results advance understanding of the key environmental drivers controlling mangrove productivity and wetland spatial distribution that provide ecosystem services essential to the well-being of society in this coastal region.

Rosenberg, Alex von, Texas State University

*Green roofs as a prospective example of reconciliation ecology and hybrid landscapes in Austin, TX: Changing perspectives of human interaction, nature and conservation in an urban environment*

**Abstract**

Recent estimates on global urbanization indicate that by the year 2030 over 60 percent of the earth's population will live in urban areas (Lin et. al. 2015). In many areas, this rapid increase in urbanization has separated urban residents from the natural systems they enjoy and maintain through advanced engineering and high-density urban design. With new urban parklands often in short supply, a variety of green infrastructure approaches have been proposed by architects and engineers to help provide urban dwellers with access to natural landscapes. Green roofs are a popular approach in green infrastructure as they can provide long-term economic, social and ecosystem services without contributing to urban sprawl. However, there are no consistent databases, spatial or otherwise, tracking these structures. Results here focus on the development of a green roofs geographic information system (GIS) for Austin, Texas. Online archives and interviews with green roof owners, designers and builders as well as academic experts in the fields of sustainability and ecological conservation are leveraged to provide an accurate and up-to-date geographic representation of Austin's green roofs landscape. This project highlights how these spaces are able to contribute to the complex mosaic of urban life as well as how these settings relate to current discourses surrounding ecological conservation.

Ross, Samuel, Texas State University

*Examining the Encroachment of Oil and Gas Wells to State Parks within Select Counties of the Permian Basin of Texas*

**Abstract**

Protected lands, such as state parks, are located within shared confined space with oil and gas developments. Hazards associated with proximity to oil and gas extractive practices are well documented. The Permian Basin region of west Texas is a significant oil producing location and currently over 180,000 oil and gas wells are located within the region. Selecting state regulated public lands within counties of the Permian Basin region of Texas and oil and gas well location data obtained through Texas Railroad Commission, this study explores the issues of potential vulnerability through examining proximity of public lands to oil and gas development to state parks. By using geospatial methods, such as emerging hot spot analysis, this study identifies areas of vulnerability to concentrations of oil and gas development over time. This study adds to the discussion of protected area vulnerability and to the current research on hazards and landscape conditions affected by oil and gas development.

Rowley, Taylor, Louisiana State University

*Using high-resolution sUAS datasets to evaluate point bar morphology along a series of bends on the Pearl River, Louisiana*

## **Authors**

Taylor Rowley, LSU Dept of Geography and Anthropology Kory Konsoer, LSU Dept of Geography and Anthropology Mick Ursic, USDA-ARS National Sedimentation Laboratory Eddy Langendoen, USA-ARS National Sedimentation Laboratory

## **Abstract**

Point bar morphology varies greatly throughout river systems. Some bars exhibit strong asymmetry where the tail of the bar extends far downstream of the bend apex, while others are symmetric with respect to the morphology upstream and downstream of the bend apex. Grain size and bedform distributions are also non-uniform and change with the morphology of the bar. To investigate the spatial distribution of small-scale characteristics, small unmanned aerial systems (sUAS) and close-range photogrammetry techniques can offer insights when the point bar is subaerially exposed. This study uses sUAS surveys of four point bars, two with an asymmetric downstream-wrapping morphology, and two with a symmetric morphology along the Pearl River near Bogalusa, Louisiana. sUAS surveys were conducted along pre-determined flight lines, capturing images every 1 Hz. Photographs were imported into Agisoft PhotoScan Professional software to construct a three-dimensional model using structure-from-motion technology. A digital elevation model and an orthomosaic were then exported to map grain size and extract topographic features along the bar tops. The two different point bar morphologies are compared to one another to evaluate differences in spatial patterns of grain size and bedform morphology.

Sanchez, Allie, Northwest Vista College

## *Community College Student Climate Change Knowledge*

## **Authors**

Farhana Khan, Scott L. Walker

## **Abstract**

The purpose of this study was to assess community college students' knowledge of climate change. We administered the Climate Change Content Knowledge Assessment through Qualtrics to a non-probability sample of convenience consisting of students at Northwest Vista College (NVC) in San Antonio, TX. Instrument reliability analysis resulted in an alpha coefficient of 0.78. The overall mean score was 41% out of a possible 100% (N = 281). The lowest scores were on items regarding radiation and greenhouse gases. The highest scoring items were related to glaciers, weather, and carbon dioxide. A significant outcome was the difference in scores between genders. Male participants scored 38% on average (n = 141, SD = 0.19) while female participants scored an average of 44% (n = 128, SD = 0.16). Another noticeable trend was between ethnic groups. Asian students scored the highest at 46% (n = 12, SD = 0.14). Hispanic students scored an average of 40% (n = 159, SD = 0.17). We found that climate change knowledge is limited among the general undergraduate student population at Northwest Vista College. Although the overall mean score was low, it did not differ radically from previous research using this instrument. Our study was predicated by a study of 4-year university students who had completed an Earth Systems

science course and their mean score was 62% (n = 122). Climate change knowledge has become increasingly important in recent years and the necessity of educating college students on the subject has proven to be deficient.

Sarmiento, Eric, Texas State University

*Exploring the potential of food hubs for democratizing food systems: Oklahoma City's Farmers Public Market*

### **Abstract**

Food systems researchers, practitioners, and policy-makers are paying increasing attention to urban and regional food hubs as potentially important avenues for addressing social, economic, and environmental issues associated with conventional food systems. These multi-functional spaces present the opportunity to fill gaps in local and regional food system infrastructure related to food processing, distribution, and retail. Moreover, food hubs often seek to improve access to healthy foods in underserved areas, stimulate local economic development, and empower urban communities. As Phil Mount (2012) and others have argued, food hubs can bring together differently situated actors in the food systems, from various types of producers to institutional purchasers, food policy councils to different types of consumers. As such, these spaces also offer the potential for increased democratic participation and dialogue in food systems governance. In this paper, I explore the democratic possibilities for food hubs by drawing on theories of democratic governance, focusing in particular on Pragmatist thought in geographical research and the concepts of agonistic and deliberative democracy. I illustrate these ideas through the example of a nascent local food hub in Oklahoma City. This case highlights some innovative approaches to democratizing food systems, and exemplifies how political and economic forces that extend beyond food systems per se can challenge and constrain democratic ideals and goals.

Shah, Muna, University of Texas at Dallas

*Examining the Impacts of Physical Environmental and Demographic Characteristics on the Distributions of Subsistence and Logging Services Relative to Indigenous Villages*

### **Authors**

Shah, Muna, Cummings, Anthony R.

### **Abstract**

Historically, human activities and the human presence shaped landscapes to support their subsistence lifestyles and economic development. As a consequence of human presence the distribution of plant species, and by extension the ecosystem services derived from such plants, have been observed near homesteads. Yet, to date most studies on the distribution of ecosystem services relative to indigenous peoples' homes have been ethnographic in nature. In this study, a spatial analysis approach was conducted to examine whether human impacts on the distribution of two types of provisioning ecosystem services, subsistence uses and commercial logging, relative to indigenous villages could be identified. Six physical environmental and demographic variables were assessed for their potential influences on the distribution of the two ecosystem services. Data on ecosystem services were obtained for the Rupununi, Southern Guyana, and their distributions were regressed against their distance to the nearest village, road, and waterway, in addition to elevation, slope, and the population of the nearest village. It was found that at the level of landscape, all six variables significantly influenced the distributions of both the ecosystem services. However at the level of individual villages, while the demographic variable was found to consistently influence the distributions of the two ecosystem services, this was not the case for the physical environmental variables. The spatial analysis approach provided support to the findings of earlier ethnographic work by demonstrating spatially how human presence can affect the distribution of ecosystem services within a landscape.

Simms, Jessica, Louisiana Office of Community Development

*“The Vanishing Isle de Jean Charles: A Resettlement at the Community Scale”*

### **Abstract**

Recent rapid and slow-moving socio-natural disasters in the Gulf Coast (and U.S. more broadly) are prompting dramatic landscape shifts, forcing people to migrate to new and unfamiliar places. These numbers will likely continue to rise. Recently gaining traction as an impetus for migration, climate change serves to exacerbate the multi-faceted causal contributing factors of migration, including land loss, livelihood shifts, storm-related obstacles, and more for littoral residents. Particularly in coastal Louisiana, these disasters are compelling residents, many of whom are intimately familiar with these disruptive and displacing experiences, to undertake migration as a form of climate adaptation. With more than 90 percent landmass loss over the last 60 years, the remaining residents on Isle de Jean Charles, a coastal community in remote Terrebonne Parish, Louisiana are at the forefront of this climate-migration nexus. The Island itself is expected to disappear completely over the next 50 years – or upon the next significant tropical impact. Most residents of Isle de Jean Charles are socially and economically marginalized Native Americans with a generational history of forced displacements. In 2016, the Isle de Jean Charles community partnered with the State of Louisiana to develop the first publicly funded resettlement in American history with a \$48.3 million grant awarded by HUD. This presentation will focus on the project's progress to date, with specific emphasis on outreach and engagement, migration as adaptation at the community scale and the precariousness of place, both biophysically and culturally.

Singh, Deepika, Sam Houston State University

**Authors**

Falguni Mukherjee, Sam Houston State University Deepika Singh, Sam Houston State University

**Abstract**

Flooding is one of the most devastating natural disasters in the world that causes massive damages to natural and man-made features every year. As urbanization continues at an unprecedented rate the damage caused by such natural disasters keeps increasing. Moreover, as human population continues to explode, settlements keep expanding and human activities continue to grow in low lying areas vulnerable to flooding activities. Different strategies have been adopted to prevent flood hazards. One such strategy is flood susceptibility mapping to identify vulnerable areas prone to flooding. Such mapping processes are important for early warning system, emergency services, prevention and mitigation of future floods and implementation of flood management strategies. Harris County is a rapidly growing metropolitan area, situated on a low-lying coastal plain with little topographic relief and high susceptibility to flooding. This study incorporates a GIS based weighted multi-criteria analysis to determine flood prone areas in Harris County, Texas by integrating eight flood conditioning factors such as slope, elevation, soil type, rainfall intensity, flow accumulation, LULC, NDVI and distance from river and distance from road. The objectives of this study is threefold. Firstly, to calculate a composite flood hazard index to determine the impact weight of the selected eight flood conditioning factors. Secondly, to combine the conditioning factors using weighted overlay method in ArcGIS to map the areas in Harris County that are prone to flooding. And finally, to overlay the 2017 FEMA flood hazard map on the weighted overlay flood hazard map.

SINGH, CHAYANIKA, TEXAS STATE UNIVERSITY

*Being Lonely... a geographic analysis of Twitter feeds on Loneliness*

**Abstract**

Every day, millions of people use social media such as Twitter, to express their feelings, thoughts and mental state in textual form. This user-generated data is becoming a primary source of spatial database. This voluminous big geo-data can provide powerful insights through geographic visualization for numerous societal phenomenon which otherwise may not be observed. In this study, I evaluated one such use case- to find people suffering from social isolation who express their loneliness on Twitter to seek help from society. By analyzing Tweets containing loneliness emotion, examining its statistical significance and spatial agglomeration in a geographical context, we formulated a methodological framework of research to study the geography of mental health and well-being using social media data. We collected Tweets between Oct 5th to Nov 28th, 2015 based on keywords search of synonymous texts expressing loneliness emotion, for the United States. Out of 237,299 tweets examined in this study, approximately 15% were geo-tagged at

locations either at sea beaches, lake shore or inside a water body (lake or sea). My findings indicate that there is high potential to analyze the clusters in detail to identify extreme cases of mental illness and their locations where help could be provided.

Smith, Deirdre, Louisiana State University

*The TETRA-II Experiment to Observe Terrestrial Gamma Flashes at Ground Level – Analysis of Nearby Thunderstorm Activity and Comparison with Lightning Data*

**Authors**

Deirdre Smith, Christopher Adams, Michael L. Cherry, Samer Al-Nussirat, Shuju Bai, Yaser Banadaki, Phillip Bitzer, Jonah Hoffmann, Ebrahim Khosravi, Marc D. Legault, Mina Orang, Donald J. Pleshinger, Reniel Rodriguez, Jill Trepanier, Anderson Sunda-Meya, Natalie Zimmer

**Abstract**

Terrestrial gamma ray flashes (TGFs) are millisecond bursts of high-energy electrons propagated within the atmosphere associated with lightning. The TGF and Energetic Thunderstorm Rooftop Array (TETRA-II) detects TGFs from thunderstorms at ground-level in four locations: the campus of Louisiana State University (LSU) in Baton Rouge, Louisiana; the campus of the University of Puerto Rico at Utuado, Puerto Rico; the Centro Nacional de Metrología de Panamá (CENAMEP) in Panama City, Panama; and the Severe Weather Institute and Radar & Lightning Laboratories in Huntsville, Alabama. The ability to observe ground-level bursts from close to the source allows an examination of the storm cells producing these events. An analysis of storms associated with TETRA II gamma-ray events is provided using NEXRAD Level II base-reflectivity and echo top scans to determine specific storm features before, during, and after the occurrence of each event. Preliminary results show that events occur within most major thunderstorm types, in particular outside the center of cell maximum intensity or as the cell is transitioning into the dissipating stage of cell evolution, suggesting storm strength is not necessarily responsible

Smith, James, LSU

*An Evaluation of Modified bed load Sediment Transport equations for Enhanced Sediment Transport Quantification in Steep Mountain Streams – Case Study Little Fountain Creek, Colorado Springs, Co.*

**Authors**

James Smith, Dr. Kory Konsoer, Dr. Carol Wicks



## **Abstract**

Little Fountain Creek watershed is located ~17.6 km southwest of Colorado Springs. The channel morphology of Upper Little Fountain Creek (ULFC), where Louisiana State University owns ~5.7 km<sup>2</sup>, is classified as a steep mountain stream with cascade, step-pool, and exposed bedrock reaches. In 2013, an extreme rainfall event delivered 15+ inches of rain over several days, and resulted in a record-breaking flood that infilled Keeton Reservoir, located within ULFC watershed, with 12,615 m<sup>3</sup> of sediment, roughly 60% capacity of the reservoir. Upstream of Keeton Reservoir, Little Fountain Creek is ungauged, however the volume of sediment deposited in the reservoir due to this event allows for an analysis of the hydraulic and sediment transport characteristics during the flood. Thus, the objectives of this study are: 1) approximate the flood hydrograph for ULFC using a scaled relationship developed from a neighboring gauged watershed, 2) collect detailed field surveys of channel morphology and grain size distribution within a ~50 m reach of ULFC, 3) reconstruct hydraulic parameters during the flood using two methods of shear stress partitioning developed for steep mountain streams, and 4) estimate sediment transport rates and total sediment flux during the flood event and compare to the measured volume of sediment deposited in Keeton Reservoir.

Theobald, Rebecca, University of Colorado Colorado Springs

## *Apportionment and Redistricting: Asking geographic questions to address political issues*

### **Abstract**

The object of this project is engagement – providing students and community members with resources to discuss how fair representation in elected bodies at federal, state, and local levels is essential to hearing all voices in a community. Gerrymandering – dividing political entities into election districts to give one political party a majority in many districts while concentrating voting strength of another party into as few districts as possible – is a recurring headline. This activity examines legislative districts and explores implications of drawing lines to support those in power. Over the past forty years, the percentage of moderate representatives in legislative bodies at state and federal levels has decreased, posing a problem for effective governance. This presentation demonstrates a sequence of activities to support college instructors, secondary teachers, and community educators in explaining the geographic, mathematical, and civic implications of apportionment, redistricting, and gerrymandering. National Geographic's State Giant Maps provide historical context, examining the movement of population over time. Resources from lawyers, mathematicians, and politicians offer current insights. Online mapping tools use Census data to allow students and citizens to create congressional districts. Participants will undertake spatial analysis to understand the apportionment process, explore mapping methods to understand the history and development of Congressional districts, and learn geospatial tools to incorporate 2010 Census data in a redistricting exercise for any state. The process can then be applied to state or local legislative districts, albeit at a different scale.

Thompson, Derek, Louisiana State University

*A Comparison of Tropical Cyclone Landfall Locations between the HURDAT2 Best Track and the NCEP/NCAR Reanalysis I Datasets*

**Authors**

Derek T. Thompson, Louisiana State University Barry D. Keim, Louisiana State University

**Abstract**

For historical analysis of various meteorological and climatological variables, researchers utilize retroactive analysis, or reanalysis, datasets. One of the first major reanalysis datasets is the NCEP/NCAR Reanalysis I dataset, which contains observations of atmospheric conditions every six hours from 1948 to present. With respect to tropical cyclones, the main dataset used for historical analysis is the revised Atlantic hurricane database, or HURDAT2, which contains tropical cyclone location and intensity characteristics from 1851 to 2017. The goal of this project was to compare the two datasets by analyzing tropical cyclone landfall location along the United States' East and Gulf Coasts for the period from 1948 to 2016. To do this, landfall locations for various tropical cyclones were determined for both datasets, with attention focused primarily on the geographic coordinates as well as the straight-line distance between each dataset's particular landfall locations. On the coordinate level, the difference in longitude between the two datasets was greater than the difference in latitude, with the average longitude difference being almost twice the average latitude difference. Furthermore, it was determined that roughly two-thirds of all tropical cyclone landfalls as determined by NCEP/NCAR Reanalysis occurred to the west of where the HURDAT2 dataset established landfall, with roughly 75% of the NCEP/NCAR Reanalysis landfalls shifted westward in the Gulf of Mexico. With respect to straight-line distances, the two datasets differed by roughly 95 kilometers on average, with landfalls in the Gulf of Mexico exhibiting larger location difference discrepancies than the East Coast.

TRALDI, MARIANA, Texas A&M University, College Station

*The socioeconomic impacts of construction and operation of wind farms in northeast Brazil*

**Abstract**

The Northeast region of Brazil is a new frontier for the world wind industry. This industry has been seen by many political actors as a way generating local economic development by creating jobs and increasing tax collection. This paper aims to test this claim on a group of four counties with data collected on employment and tax collection from Brazilian government databases. The four counties were divided into two groups. In the first group were Caetité and João Câmara, where there were many wind farms under construction, and in the second group, there were Guamaré and Beberibe, where wind farms were operational. The claim about local tax collection growth invalid for the first group whereas for the second group it was not. There was indeed a significant increase in local tax collection, but only when there still were wind farms under construction. After construction, tax collection decreased to pre-wind farms levels. The same methodology was used to verify whether wind power plants are job creators. In both groups, new jobs were created after the arrival of this industry, but not as much as it was expected. In the first group the number of

new jobs was higher and most of them related to construction activity. In the second group, new jobs were related to the wind farms, but those were less than in the first group and more related to maintenance and security. In summary, during the construction period jobs and local tax collection both increased while during the operation period neither the increase in jobs nor in tax collection remains as high as they were during the construction period. Wind farms in the Northeast of Brazil may not be a strong stimulus for local economic development as initially thought, especially in terms of work and income.

Travis, Charles, University of Texas, Arlington

*Deep Mappings: Carl Sauer, GIS and the literary perceptions of the American West from the 1840s to the 21st Century*

### **Abstract**

This paper discusses the inauguration of a spatial humanities monograph project which in revisiting the work of Carl Sauer (and other doyens of American cultural geography) will in part map the works of Texas author Larry McMurtry, in conjunction with the prose of Charles Bukowski, and the novels of African-American crime writer Walter Mosley, and other LA Noir Detective Fiction writers -all whom depict marginalized representations of Los Angeles. By employing GIS in tandem with approaches developed in M.M. Bakhtin's chronotopic theory, Franco Moretti's distant reading, and the approaches of Julie Kristeva, it is possible to geographically plot the intersections of narrative and temporal networks within the texts of McMurtry, Bukowski, Mosley and other LA Noir detective fiction writers, with the physical, cultural, rural, urban and biographical landscapes and networks in which they are set, and in which they interact. Such approaches employing Saurean perspectives on landscape, mixed-methods GIS and critical theory provide a means to link the spatial and temporal intersections of these writers and their works with other novels, scripts, films, pieces of visual art, and archival, cartographical and historical documents to more deeply contextualize developments in the "American West" from the late nineteenth century to the early twenty-first century.

Trepanier, Jill, Louisiana State University

*North Atlantic Hurricane Winds in Warmer Seas*

### **Abstract**

Tropical cyclones devastate coastlines around the world. The United States and surrounding areas experienced multiple extreme events in the 2017 hurricane season. Understanding extreme hurricanes and how they may change in a warming environment is an important area of climate research. This study makes use of the significant, positive relationship between the average August-October sea surface temperatures and the per-event observed maximum hurricane wind speeds across the North Atlantic Basin using data from 1851-2016. The slope of the best-fit line is

applied to the observed maximum wind speeds across the basin to increase the wind speeds to a one, two, and three-degree warmer sea surface. These increased winds are referred to as one, two, or three-degree warmer winds. These warmer winds are put into a generalized Pareto peaks-over threshold model to estimate the return levels for various return periods across a hexagonal tessellation of the North Atlantic. Viewing the results spatially allows for geographic patterns to emerge. Comparisons between the extreme value modeled distributions using the observed wind speeds and the warmer winds' distributions are shown to be significantly different. This study provides return estimates for extreme hurricane winds in a world with warmer sea surfaces in the hopes to better inform those making important, life-saving decisions along the U.S. and neighboring coasts.

Truman, Mandy, Sam Houston State University

### *The First Eco-Architects*

#### **Abstract**

The purpose of this research project is to take a close look at the Hawaiian legend of the Menehune and the ancient sustainability constructions they are believed to have designed and built. In Hawaiian Mythology, the Menehune are a group of mischievous "little people" living deep in the forests of Hawaii that construct massive engineering feats in one night. The aqueduct system, called Kikaola and "Menehune Ditch", carries water from the Waimea River to the taro fields of Kauai. Considered a mysterious engineering phenomenon, the construction includes 120 basalt bricks that are precisely cut which would have required tools and techniques that are thought to have not existed during this time. The Alekoko Fishpond is located near the Nawiliwili Harbor, is also considered an engineering mystery at over 1,000 years old. The ponds construction allows fish, at an early life stage, to enter the pond and become trapped where they will remain until adulthood. These ancient sustainability practices are still used today. On the Big Island of Hawaii, Hi'ilawe waterfall feeds the streams that run through Waipio Valley. These streams are used to irrigate the taro patches in the lower land. The flow of the water is controlled by the placement of rocks in the opening of the stream, allowing the appropriate amount of water to enter the patches for irrigation. The key to solving today's environmental issues might be in ancient sustainability practices.

Tucker, Clay, Louisiana State University

### *Event-Based Climatology of Tropical Cyclone Rainfall in Houston, Texas and Miami, Florida*

#### **Authors**

Clay S. Tucker. Jill C. Trepanier

#### **Abstract**

Tropical cyclone (TC) rainfall amounts are compared from 1950–2017 for Houston, Texas and Miami, Florida to estimate the risk of TC rain. Following the wake of Hurricanes Harvey and Irma in 2017, some uncertainty has risen over the future of raininess in these locations. Per-event rainfall amounts are aggregated using tracks taken from HURDAT, time-of-rain gathered from National Weather Service daily weather maps, and rainfall totals taken from airport monitoring stations. Risk analysis tools include descriptive statistics, time series, and return frequencies for Houston and Miami, and spatially interpolated surfaces for Hurricanes Harvey and Irma. The season duration is longer in Miami than in Houston. The uppermost rainfall events in the distribution for Houston show a significant increase through time, suggesting the most intense rainfall events are becoming worse for Houston. The expected return frequency for a Harvey-like event (940 mm) in Houston is every 230 years, on average, and the 90th percentile rain of 286 mm is expected once every 17 years (11–29; 90% significance). The expected return frequency for an Irene-like event (261 mm—maximum for location) in Miami is every 173 years, on average, and the 90th percentile rain of 167 mm is expected once every 11 years (7–17; 90% significance). Results show a substantial difference between Houston and Miami TC rainfall climatologies similar to the differences of Hurricanes Harvey and Irma. Though emergency management must be tailored for each TC, management for inland TC rainfall may be more applicable in Houston than in Miami.

Walker, Scott, Northwest Vista College

### *Marketable Skills and Geography Fieldwork in Higher Education*

#### **Abstract**

The purpose of this study was to identify the extent to which undergraduate students involved in a hydrology and fluvial geomorphology-oriented physical geography fieldwork program experienced and/or were engaged in marketable skills. At the end of a physical geography fieldwork program, students were administered a 31-item “marketable skills” instrument with a 5-point Likert-like response scale. Descriptive, reliability, and bivariate correlation analyses were completed on the results demonstrating the students’ perceptions of their newly acquired skills. In addition, I included three open-ended questions related to students’ responses. I analyzed these results using a phenomenological analysis approach. Quantitative results indicated that the instrument had a Cronbach’s alpha of 0.91. The mean response to all 31 items was 4.4 (on the 1-5 scale). Two items related to diversity resulted in perfect responses of 5. From the open-ended items two themes emerged: (1) students perceived “teamwork” as being a skill employers would find important and they were able to give concrete examples from their fieldwork. (2) Students equally believe employers would find “leadership” as important; however, none gave concrete examples of leadership from their fieldwork. Items related to diversity had the strongest means from the instrument results (M=5) and the second strongest means were items related to teamwork, interpersonal skills, application of knowledge (M=4.8), which were also statistically associated with  $r > 0.91$ . Teamwork and leadership were found to be perceived as important to employers, however, not necessarily to the students themselves.

Wang, Fahui, Louisiana State University

## *Big Data, Better Stories*

### **Abstract**

In contrast to “designed data” such as the census data collected via surveys, big data are “organic” and collected automatically by tracking transactions of all sorts. The availability of “big data,” especially human motion data from location aware devices (LAD) including mobile phones and Global Positioning System (GPS) receivers, afford us a rare opportunity to examine and predict human mobility with unprecedented accuracy. The data are (1) individual trips with accurate records of trip origins, destinations, and trip lengths, (2) representation of a large population, (3) updated instantly, and (4) cost-efficient. This presentation will use three case studies to demonstrate that big data are sharper, faster, and cheaper, and thus enable us to tell better stories.

Wang, Lei, Louisiana State University

## *Mapping coastal bathymetry change using a Kriged Kalman Filter*

### **Authors**

Lei Wang Xinxin Liang Jun Wang

### **Abstract**

We present an application of the spatio-temporal data assimilation method-Kriged Kalman Filter to map the dynamics of the bathymetry in the coastal area of Shanghai, China. The method was implemented as a localized interpolator that used data samples collected from a boat-based sounding device in a nearby area to calibrate the Kalman filter and Kriging prediction model. The model prediction was validated in both space and time. The accuracy was sufficient and satisfactory to study the bathymetry change over a long time period of 100 years. The localized implementation was the key to make the mathematical model work under the spatio-temporal computation framework. The model was able to handle the unstructured sample data - namely, the data were sampled from a mobile equipment rather than the fixe stations.

Webb, Hannah, Texas Tech University

## *The Magic of Tourism: A Look into the Spatiality of Harry Potter Tourism in Edinburgh*

### **Abstract**

The Harry Potter series by J. K. Rowling has profoundly touched the lives of many readers. The books and later the movies became a global cultural phenomenon of unimagined proportions. Set in the United Kingdom, many of the places in the books and many of the scenes in the movies are based on locations in Edinburgh, Scotland, the city where Rowling wrote most of the Harry Potter

series. These locations in Edinburgh have become places of Harry Potter tourism. The aim of this research is to show the ways in which the Harry Potter series has reshaped and reimagined the meanings of place at selected locations in the city of Edinburgh. During the summer of 2018 I conducted fieldwork in Edinburgh with The Potter Trail walking tours, a tour company that specializes in connecting the fictional places of the books and movies to their real-world counterparts in the city. Over a three day period I was a participant observer of eight tours that included approximately 300 tourists. During this time period I interviewed 30 tourists. The preliminary analysis of my data suggests that visitors take these journeys in order to encounter points of connection, facilitated by the tour guides, which challenge the line between fiction and non-fiction. In this way, they are able to experience the magic of Harry Potter for themselves.

Whitesell, Dominica, University of Texas at Austin

*Market Fires and Rights to the City: Understanding Globalization and Gentrification through Park Yard Market in Kampala*

**Abstract**

In this paper, I examine how geopolitical and geoeconomic shifts are enacted through the often-overlooked spaces of consumption in Kampala, Uganda. I use a feminist and postcolonial lens to center the lived experiences and spatial encounters of young, primarily female Ugandan used clothing vendors, using their stories to understand how these women carry out, disrupt, and navigate rapid processes of neoliberal urbanization and gentrification. Specifically, I examine the Park Yard market and its numerous fires since 2009. Using archival methods (national media coverage of the market since 2001) and ethnographic data collected in the summers of 2015 and 2017, I analyze the various tensions around the Park Yard market space to better understand broader issues around urbanization, international investment, and individual autonomy.

Wiley, Delorean, Texas State University

*Beer Social: A Spatial and Temporal Footprint of America's Popular Beers*

**Abstract**

Beer is more than just a frothy, carb-filled libation; it is a social and nutritional supplement that, throughout history, has offered interesting geographic trends. Still, studies of beer culture beyond expensive consumer preference survey and tasting, historical record, or market trends are sparse. Social media offers a potential venue for academics to cheaply and abundantly gather geographic information about beer. Using geotagged Twitter data, I mapped the spatial and temporal footprint of popular beers as identified by users of Beer Advocate (a beer community website) to see if any trends emerged. Results showed the dataset can identify regional differences for popular beer labels. In conclusion, geotagged Twitter data fused with a community-centered source offers a cheap way to collect a large amount of data and offers new aspects of beer culture to study.

Wong, Emily, University of Oklahoma

*Changes in Summertime Synoptic Patterns in the 21st Century for Selected US Cities*

**Abstract**

Climate variability has had an increasing impact on the human population. The change in the chemical composition of the atmosphere, especially through anthropogenically produced increases in radiatively active trace gases such as CO<sub>2</sub>, have contributed to climate change. This study uses downscaled GCM scenario estimates for select cities in the United States to determine any impacts future climate variability might have on synoptic patterns. Using an established spatial synoptic classification scheme, the GCM data was used to develop a daily synoptic calendar for each city for select summertime periods through the twenty-first century. The downscaled data was analyzed and examined to identify changes in frequency of different air masses throughout the century as well as changes in the air mass character and regional variability of air mass change. Historical data from 1980 to 2010 was utilized to compare future climate projections to the past. Results show an increase in moist tropical air masses in the summer throughout the twenty-first century over the US. Spatially, an increase of extremely hot and humid air masses over the eastern cities in the US was prevalent through both CO<sub>2</sub> emission scenarios. The air mass character is projected to change as well, with the most significant example being an increase in average afternoon temperatures in the moist tropical air mass. These results show how important it is to consider where the most extreme effects of climate change are occurring to see which populations may be most affected.

Xu, Yaping, Louisiana State University

*Downscaling SMAP Soil Moisture Using Random Forest and Regression Kriging*

**Authors**

Yaping Xu, Lei Wang, Cuiling Liu, Rudy Bartels and Xukai Zhang

**Abstract**

We present a spatial statistical downscaling method that is capable of fusing multi-scale geospatial data with the soil moisture product from NASA's Soil Moisture Active and Passive (SMAP) satellite. The multi-scale data includes the 9-km resolution SMAP soil moisture image, 1-km resolution normalized difference vegetation index (NDVI), 30-m resolution digital elevation model (DEM), 1-km resolution MODIS land surface temperature (LST), 500-m resolution gross primary productivity (GPP), and West Texas Mesonet (WTM) station data. We used the random forests machine learning method to make a downscaled soil moisture prediction at the 1-km resolution. Then, a regression kriging was applied to calibrate the downscaled soil moisture using the WTM station data. The validation was based on the unbiased root mean square deviation (ubRMSD) of the test set separated from the calibration set from the WTM station data. The validation showed that the downscaled soil moisture data at 1 km resolution can significantly



improve the accuracy of the soil moisture product as well as enhancing its spatial resolution. The present work has its novelty in using the spatial statistic method to reconcile the scale difference from satellite data and ground observations.

Yut, Katherine, University of Oklahoma

*Using Spatial Modeling to Identify Areas Susceptible to Gentrification in the South Central United States*

**Abstract**

Gentrification is an increasingly prevalent, often irreversible process of housing change that both revitalizes neighborhoods and displaces their inhabitants. Despite significant research attention, gentrification has only been modeled historically. Here, we introduce the first version of a spatial model for visualizing future gentrification potential. We build on a literature review of leading gentrification indicators, including median housing cost, vacancy rates, and surrounding amenities. While accurate measures of gentrification, lagging indicators appear in the data after gentrification occurs, not before, rendering them useless in this predictive model. Common lagging indicators of gentrification, such as median income, age, and education, are excluded. Using census data, the model normalizes, weights, and sums the leading indicators into a gentrification susceptibility index on the block group level. The map output visualizes the gentrification susceptibility indices, identifying neighborhoods at risk of gentrifying. Next steps in this research project include validating the model against preexisting data.

Yoder, Michael, University of Central Arkansas

*Economic Development, Land Use, and Commercial Transportation in Two Small Cities of South Texas*

**Abstract**

Studies of economic development of cities overwhelmingly address the largest of the world's urban areas. Such studies rightly emphasize ways that economic development is deeply intertwined with each city's spatial layout and its transport and supply-chain connections. However, little is written about the economic development of small cities and their regional, national and global connections. This paper is the summary of research conducted in the summer of 2018 on two small cities of South Texas, Beeville and Gonzales, that pursue economic development, yet face challenges related to transportation and to small and inadequately developed workforces. Yet, to varying degrees, each has been impacted by national, regional and local economic activities as well as by international trade. Hydrocarbon energy production had been important to both, but they diverge in terms of manufacturing. Main Street development is a major focus of community leaders in both cities. The two case studies are based largely on qualitative research methods that include interviews, snowball sampling, and triangulation with data obtained from the business press and from web sites of local governments, non-profit economic development entities, and

companies. Thus, the paper presents not only profiles of Beeville and Gonzales, but insights into qualitative ways of studying economic development policies of small cities.

Zimmer, Anaïs, University of Texas at Austin

*Alpine ecosystems establishment and ecosystem services in recently deglaciated landscapes: an assessment to advance periglacial area management policy.*

### **Authors**

Anaïs Zimmer, University of Texas at Austin, United States Fulbright Fellow, 2018-2019 and Monahan Foundation Grantee, Timothy Beach, University of Texas at Austin, United States

### **Abstract**

Glacier retreat is accelerating in most mountain regions of the world, which exposes increasing “virgin” area to ecological succession. Our research objectives are to evaluate ecological changes at the community and ecosystem level, and their influence on ecosystem services. We aim to advance land use management of areas recently deglaciated to maximize ecosystem functions like supplying water for downstream populations. Two published articles of the author form the main technical background of this project. Based on this study, held in the Tropical Andes, we hypothesize that the increasing time lag between the velocity of global warming and the slowness of primary succession drive species range shifts and possible species extinctions in alpine regions. We found consistent patterns in plant succession—abundance, species richness, and functional strategies—along post-glacial chronosequences. Dispersal limitation, deficient facilitation among plants, and competition for nutrients are limiting factors for primary succession. We now begin to apply a similar methodology to multiples sites in the Andes and Alps, setting up a biogeographical comparison between continents. We will focus on a deeper functional approach to study the patterns of upward migration of alpine plant communities and soil processes. Our hypothesis is that new post glacier ecosystems won't provide the same services as actual adjacent ecosystems. We aim to develop a model that assesses the relations between shifts in alpine plant community and ecosystem establishment. Ultimately, we plan to experimentalize alpine deglaciated area management methods that can benefit to ecosystem development and therefore facilitate human adaptation to climate change.

## CONFERENCE SPONSORS



# TEXAS STATE <sup>®</sup>

---

## GEOGRAPHY



*Ron Hagelman, Texas State University*