



AGC 2020 PROGRAM ABSTRACTS

Listed by Day and Session

Please use **CONTROL+F** (or **APPLE+F**) to search for author names or keywords

Track: Social Justice

When: Monday, October 19 at 9am EST

PAPER SESSION: Social Justice: Authority and Activism

Session Chair: Dawna L. Cerney (dlcerney@ysu.edu)

Session Description: The former Mayor of Flint (2009-2015) discusses the decisions that he and other mayors have had to address during this decade of disruption to include the COVID-19 pandemic. Dayne Walling provides salient warnings and recommendations regarding bureaucracy's scope, distance governing, and the need for timely response to citizen activism. This paper is paired with a discussion of how drones can be used in environmental justice activism, especially within the fight against Mountaintop Removal Mining (MTR) in Appalachia. Specifically is discusses tactics used by the Coal River Mountain Watch along with other groups to include Greenpeace, The Sea Shepherds, and DAPL Protesters, in their efforts to expose environmental degradation and exploitation, challenging knowledge production and epistemological assumptions.

Paper 1: Warnings on Authority and Power from the Crises in Flint, Michigan, USA

Dayne Walling, University of Minnesota, Department of Geography, Environment and Society

Flint is my hometown and where I served two terms as mayor from 2009-2015 including the start of the water crisis, the most recent and tragic of the disasters affecting the Vehicle City since the auto plant closing epidemic in the 1980s famously chronicled by Michael Moore in his first documentary film *Roger & Me*. The City of Flint, and mayors in particular, have faced difficult decisions in uncertain environments time and again, including during the current pandemic. Based on my own reflections and conversations with mayors, this paper presents a series of warnings on government and scientific authority and power including: a) the narrow scope of the bureaucracy; b) the problems of governing from afar; and c) the failure to respond in a timely manner to citizen activism. Each of these warnings, in turn, is the basis for recommendations on the ways in which data- and evidence-based decision-making processes may better incorporate a multi-dimensional framework of understanding; a triple-check process of verification; and a respect for local autonomy and capacity within a democratic system of good-faith governance. The paper also includes an update on Flint's recovery and the positive policies and interventions in place to address both the COVID-19 pandemic and racism as public health crises.

Paper 2: Drones, Activism, and Mountaintop Removal Mining in West Virginia

Aron Massey, West Liberty University

This research project examines the usefulness of drones in environmental justice activism, especially within the fight against Mountaintop Removal Mining (MTR) in Appalachia. The paper examines the tactics of Coal River Mountain Watch, a group of anti-MTR activists that use drone surveillance to enhance their fight against this destructive practice. The paper also examines other groups such as Greenpeace, The Sea Shepherds, and DAPL Protesters. Each of these groups utilizes drones to monitor and expose environmental degradation and exploitation. The use of drones increases the complexity of strategies employed by Appalachian activists and challenges many of the traditionally held, but continually critiqued, stereotypes present in Appalachian research. Beyond a deeper understanding of Appalachian activism, this paper investigates the ways in which knowledge production and epistemological assumptions are



Track: Education

When: Monday, October 19 at 9am EST

PAPER SESSION: Teaching Social Geography

Session Chair: Linda Peters (lpeters@esri.com)

Session Description: Learning by doing can take several forms. Service learning in particular allows the student to understand the direct utility of the course work. This session discusses a plan that partners with a local Historical Society and a course where the client is the students educational institution. One course helps the student use and develop skills geospatial skills, and the other develops student understanding of flood related awareness and flood education.

Paper 1: Service-learning and geospatial skills: What do the participants think?

Lisa Millsaps, University of Northern Iowa

This project focuses on the perspectives and perceptions of the people who take part in geospatial skill focused service-learning experiences, specifically the students and the collaborative partner. Data was gathered as part of a newly transformed service-learning course. A collaborative partnership has been formed with the local Historical Society for this course as the service-learning partner. The revision of this course is part of a university wide service-learning initiative and the research will contribute to need in the literature to target better understanding of the participants perspective, rather than the process of service-learning, which has been established. To do so, it will categorically examine the use of GIS as a geospatial skill, the professional working relationship developed between students and the collaborative partner, and overall perceptions of the participants. Qualitative and quantitative data will be in the form of surveys, interviews, and classroom artifacts. Results are expected to suggest ways to revise the course, enhance the role of the student, and strengthen the relationship with the collaborative partner.

Paper 2: Flood Hazard Awareness at Old Dominion University: Assessment and Opportunity

Nicole S. Hutton, Old Dominion University

Michael J. Allen, Old Dominion University

Building resilience to flooding is a commitment of several universities. Although education programs at universities have been proposed, the demand for them has not been explored. The goals of this research are three-fold: i) to determine the origin of flood messaging on campus ii) to determine the role of on-campus flood-related awareness iii) evaluate the desirability of additional flood education. Results (n=110) show that students receive warnings through a variety of media sources and additional information from both in-class instruction and orientation-based programming, although the content varies from scientific to action oriented. There is higher perceived risk among individuals who experienced reduced access to campus. Many students who noted a campus flood risk expressed an interest in additional flood information. These findings could support the development of a campus wide flood awareness program at Old Dominion University and support other such activities at other universities.

Track: Census

When: Monday, October 19 at 9am EST

PAPER SESSION: Perspectives on Identifying and Defining Urban, Suburban, and Rural Areas, Part 1

Session Chair: Michael Ratcliffe (Michael.r.ratcliffe@census.gov)



and can describe. The presentations in these two sessions explore what makes places urban or rural, how individuals self-define their context, and various ways to define the urban and rural landscape.

Paper 1: What makes a place urban?

Sean Fox, School of Geographical Sciences, University of Bristol

Corporeal density is the defining attribute of urbanism. The sustained concentration of many human beings in a specific geographic location—physical co-presence in a place—has wide-ranging environmental and social consequences that render urban living distinct from rural living. As demonstrated through a series of thought experiments, alternative definitions incorporating measures such as the economic structure of a community, the presence of physical infrastructure, the political or administrative status of a geographic unit, or the degree of connectivity between people do not capture the true nature of urbanism but rather some of its emergent effects. These effects may arise from the high frequency of direct and indirect material interactions of many individuals over time in a specific place, but not always. By contrast, sustained corporeal density, which makes physical interactions between people unavoidable, is a necessary and sufficient condition for classifying a place as urban. While we may debate the appropriate population density thresholds for classifying a human settlement as truly urban, there is no doubt that such a category exists and is distinct from other forms of human settlement. Minimum population thresholds for classification are proposed and the implications for the classification of functional urban regions is discussed.

Paper 2: The Urbanization Perceptions Small Area Index: An Application of Machine Learning and Small Area Estimation to Household Survey Data

Emily Molfino, U.S. Census Bureau

Shawn Bucholtz, U.S. Department of Housing and Urban Development

Urban and rural definitions are abundant in government, academic literature, and data-driven journalism. Equally abundant are debates about which factors should be used to define these terms. Absent from most discussion is evidence about how people perceive or describe their neighborhood. Moreover, as housing and demographic researchers have noted, the lack of an official definition of suburban obscures the fact that a majority of Americans live in a suburban setting. The Department of Housing and Urban Development asked 2017 American Housing Survey (AHS) respondents to describe their neighborhood as urban, suburban, or rural. We used the AHS “neighborhood description” data to create the Urbanization Perceptions Small Area Index (UPSAL). We applied machine learning techniques to the AHS neighborhood description question to build a model that predicts how out-of-sample households would describe their neighborhood (urban, suburban, or rural), given regional and neighborhood characteristics. We then applied the model to the American Community Survey aggregate tract-level regional and neighborhood measures, creating a predicted likelihood the average household in a tract would describe their neighborhood as urban, suburban, and rural. Our approach uses existing federal data to create an innovative new data product of substantial interest to researchers and policy makers.

Track: Student Papers

When: Monday, October 19 at 9am EST

PAPER SESSION: Student Paper Presentations

Session Chairs: Clayton Whitesides (cwhitesid@coastal.edu) and Brandon Vogt (bvogt@uccs.edu)

Session Description: Student Paper Presentations

Paper 1: Spatiotemporal shoreline change from (2000-2019) at Umlajj province coast, Western Saudi Arabia, using a series of quality-control

Khalid H. Alharbi, Dept of Geography, King Saud University

Monitoring shoreline positions is critical not only for coastal evolution, geomorphology, and ecosystem but also for development and planning. Remote sensing data is proving to be a valuable means for monitoring



through space and time. To account for shoreline dynamic and perform a long-term analysis, we used seasonal averages, in which three or more Landsat images were used in a given year. Further, a series of quality-control was applied, including atmospheric correction, image registration, and accuracy assessment. Umlajj province, west coast of Saudi Arabia, was selected as a case study (2000-2019), given the ongoing development and investment (i.e., NEOM project). We hope this work would promote more comprehensive procedures for short and long-term shoreline monitoring.

Paper 2: Remote Sensing of Drought Disaster Events over Free State Province, South Africa

Israel R. Orimoloye, Disaster Management Training and Education Centre for Africa; Centre for Environmental Management, University of the Free State, South Africa

Johanes A Belle, Disaster Management Training and Education Centre for Africa, University of the Free State, South Africa

Olusola O. Ololade, Centre for Environmental Management, University of the Free State, South Africa

An effective disaster management approach for dynamics representation of drought events for spatio-environmental drought distribution requires space-based information. In this study, drought disaster events for three years (2016, 2017 and 2018) were evaluated using remote sensing data. 250m 16 days EVI (MOD13Q1.006) and climate data obtained from “Application for Extracting and Exploring Analysis Ready Samples (AppEEARS)” and NASA: Prediction of Worldwide Energy Resource (POWER) databases, respectively, were utilised in this study using R programming. Results revealed that the study area experienced drought disaster in years 2016, 2017 and 2018, however, it was more evident in January, February, October, November and December during the period. The southern regions of the study area witnessed more drought disaster conditions and its occurrence, where most of the areas witnessed below 20% drought index (severe to extreme drought conditions) especially in the affected months. This development denotes that the areas within this range are more vulnerable to drought disasters especially with a prolonged occurrence and a severe water dearth, decline in agricultural products, and loss of habitats and other natural ecosystems in the affected area. Findings from this study provide information hotspots for environmental and ecosystem conservation under drought-related events and shift toward ecologically-based environmental and disaster management.

Track: Social Justice

When: Monday, October 19 at 10am EST

KEYNOTE: Governor Martin O'Malley, 61st Governor of Maryland

Session Chair: Murray Rice

Session Description: Governor Martin O'Malley served as the 61st Governor of Maryland, Mayor of the City of Baltimore, and as Democratic Candidate for the Office of President of the United States in 2016. O'Malley's data-driven approach to performance management earned his city the Innovations in Government award from the Harvard Kennedy School of Government. Governor O'Malley is the author of an Esri Press book entitled Smarter Government (2019). In addition, he advises a number of technology companies. He lectures widely on topics ranging from Climate Change, Healthcare, the Environment, Education, and Smart Cities.

Track: Education

When: Monday, October 19 at 11am EST

PAPER SESSION: GIS Education and Professional Development



presentations discuss Geospatial technologies and civic engagement. One presentation delivers the outcomes of two courses which combine geospatial technologies and civic engagement through urban streets surveys. The other presentation discusses post GIS and GISP certification career locations, the nature of their careers and various demographics.

Paper 1: Mapping the certified GIS Professionals (GISPs) in the U.S.

Dapeng Li, Department of Geography and Geospatial Sciences, South Dakota State University, USA

Yingru Li, Department of Sociology, University of Central Florida, USA

Quynh C. Nguyen, Department of Epidemiology and Biostatistics, University of Maryland School of Public Health, USA

Laura K. Siebeneck, Department of Emergency Management and Disaster Science, University of North Texas, USA

The Geographic Information Systems (GIS) Professional (GISP) certification program has enjoyed great popularity in the past few years. We employ a data-driven method to study the characteristics and spatial patterns of the members in this certification program in the United States. The results show that the majority of GISPs (97.3%) are in urban areas and about 75% of the GISPs are male. Among all the GISPs, 3,971 GISPs (43.3%) play a managerial role, while 4,983 individuals (54.5%) assume a non-administrative role. Among the GISPs with a non-administrative role, 348 GISPs (7%) fall within the GIS Developer group, 3,392 GISPs (68%) belong to the GIS Analyst group, and 1,243 GISPs (25%) play other roles. Additionally, we also analyzed the spatial patterns of the GISPs at the state level and mapped out two hotspots and two coldspots. This study can help GIS educators and practitioners develop a better understanding of the current state of this certification program and make a contribution to the development of GIS as a profession.

Paper 2: Assessing Effectiveness of Integrating Mobile Apps, Tree Surveys, and Civic Engagement in GIS Courses

Christopher A Badurek, SUNY Cortland

This presentation reports on the outcomes of two GIS courses that engaged students in community tree surveys as part of civic engagement components of each course. First, we report on the outcomes of students participating in an upper level course, Advanced GIS. Working with a community partner from the City of Cortland, students used the Collector from ArcGIS, to collect approximately 200 data points of trees. Students from an upper level course, Environmental Remote Sensing, engaged in a tree survey for the Village of Homer, NY as part of an NSF undergraduate education grant. Students from Environmental Remote Sensing worked directly with 16 students in a collaborating upper level course, Tree Biology, to collect nearly 1000 tree data points using the iTree mobile app as well as high precision GPS units. Students then created maps and conducted image processing on aerial photography to share with the project community partner. In assessing the success of these teaching approaches, we consider two primary questions: 1) did the civic engagement component improve student learning?, and 2) did the applied learning experience provide opportunity to improve general skills such as project management, collaborative work, communication skills, and interest in lifelong learning and community service.

Track: Census

When: Monday, October 19 at 11am EST

PAPER SESSION: Perspectives on Identifying and Defining Urban, Suburban, and Rural Areas, Part 2

Session Chair: Michael Ratcliffe (Michael.r.ratcliffe@census.gov)

Session Description: There is no standard definition of urban, suburban, or rural. Researchers, organizations, and government agencies have applied different concepts, criteria, and methods for defining these categories. And, yet, these are geographical categories and landscapes each of us perceives and can describe. The presentations in these two sessions explore what makes places urban or rural, how individuals self-define their context, and various ways to define the urban and rural landscape.



To distinguish urban and rural populations in the U.S., a common practice is to use one of the official federal classifications of metropolitan/non-metropolitan (i.e., metro/nonmetro) or urban/rural areas. These classifications are not identified in public use census microdata, which makes it difficult to investigate relationships between the urban/rural status of individuals and their demographic characteristics, socio-economic status, and living arrangements. The standard binary classifications are also coarse, and they each index a distinct dimension of settlement patterns, so it can be misleading to use only one classification to generalize about urban-rural disparities. To address these limitations, we compute two continuous indices for public use microdata—average tract density and average metro/micro-area population—using population-weighted geometric means. We show how these indices correspond to two key dimensions of settlement patterns, and we demonstrate their utility through an examination of disparities in poverty throughout the rural-urban universe. Both indices are now available for recent census microdata via IPUMS USA (<https://usa.ipums.org>).

Paper 2: Proposed Urban Area Criteria for the 2020 Census

Jennifer Zandoni, US Census Bureau

Years ago, a now-retired census geographer said, “don’t tinker,” when it comes to proposed changes to geographic area concepts and criteria. The proposed changes to the urban area criteria for the 2020 Census follow that instruction and are the most sweeping since introduction of the urban cluster concept in 2000. These changes include use of housing unit density as the primary criterion instead of population density; ceasing to distinguish between urbanized areas and urban clusters; and use of worker flow data to determine whether to split large urban agglomerations formed during the automated delineation process and if so, where to draw the boundary between individual urban areas. The use of housing unit density provides for the potential tracking of changes in urban extent between censuses, a process that was not possible when using population counts and density at the census block-level.

Track: Student Papers

When: Monday, October 19 at 11am EST

PAPER SESSION: Student Paper Presentations

Session Chairs: Clayton Whitesides (cwhitesid@coastal.edu) and Brandon Vogt (bvogt@uccs.edu)

Session Description: Student Paper Presentations

Paper 1: Hearts of Dixie?: Mapping a Vernacular South in the Early 20th Century

Jesse R. Andrews, Oklahoma State University

This study extends sociologist John Shelton Reed's and his followers' work delimiting a vernacular South back to the early 20th Century. Using historic city guides, I recorded and modeled the prevalence of the terms "southern" and "Dixie" at the beginning of business names in approximately 300 cities in 1910 and 1930. Then, I mapped the ratio of the "southern" and "Dixie" relative to "national" and "American." Notably, the relative frequency of "Dixie" expanded dramatically between 1910 and 1930, while "southern" shrank proportionately during the same period. This change in the term frequency differs significantly from what studies have observed using data from the past 40 years. Notably, Dixie's expansion between 1910 and 1930 was the strongest along the route of the Dixie Highway, casting doubt on the idea that historically the term was solely an indicator of neo-confederate sympathies. Ultimately, this study problematizes some of the assumptions behind the delimiting of vernacular regions via keywords. Consequently, despite being a macroscale aggregation technique, to measure vernacular regions through interpolation requires a keen understanding of local geographies and historical circumstances.

Track: Environment and Climate Change



Session Chair: Clayton Whitesides (cwhitesid@coastal.edu)

Session Description: In this session themed environment and climate, two papers are presented concerning climate trends and climate change. In the first paper, the presenter(s) explores the spatial and temporal trends in precipitation over the Arabian Peninsula. In the second paper, the presenter(s) seeks an understanding of how social media influences the fear rhetoric surrounding climate change by conducting a sentiment analysis of various views expressed in Twitter hashtags.

Paper 1: Precipitation climatology and spatiotemporal trends over the Arabian Peninsula

Nasser A. Alsaaran, King Saud University, Dept of Geography

Ali S. Alghamdi, King Saud University, Dept of Geography

Spatial patterns and temporal trends in precipitation and its spatial means and percentiles over the Arabian Peninsula (Arabia) during the period 1981–2016 were analyzed. Analyses were based on the precipitation dataset of the Global Precipitation Climatology Centre (GPCC) Full Data Reanalysis Version 8. First, the spatiotemporal characters of annual and seasonal precipitation are mapped and explored at different geographical levels (i.e., Arabia, Subtropical Arabia (STA), and Tropical Arabia (TA)) based on a weighting scheme to account for latitudinal changes in grid-cell area. Second, trend significance was evaluated using Mann-Kendall test applied to trend free pre-whitened data and trend magnitude was estimated using the Theil-Sen estimator. Results show: (1) 25% (75%) of Arabia receives greater (less) than 109.47 mm annually and has experienced a significant decreasing trend of -0.96 mm/y; (2) STA shows higher tendency to experience more frequent decreasing trends in annual and seasonal precipitations with higher rates compared to TA; (3) significant upward trends are detected in fall precipitation over TA for the spatial mean and 25th, 50th, and 75th spatial percentiles; and (4) spring is the wettest season for both Arabia and STA and has exhibited significant downward trends in spatial means and most spatial percentiles.

Paper 2: How does social media influence the fear rhetoric surrounding climate change?

Marissa Greer, University of North Texas

Twitter has recently gained notoriety as a platform that enables the exchange of information about political viewpoints, international policy, and social movements. In this paper, we use a mixed methods approach to analyze fearful attitudes expressed by Twitter users on the issue of climate change. A sentiment analysis of Twitter hashtags representing different viewpoints is conducted using a mixed methods approach. Dominant themes surrounding discussions of climate change are identified using a random sample of Tweets (n=1000) for each hashtag. Relationships between these themes and fearful attitudes expressed on Twitter are analyzed using a frequency analysis of commonly used terms and words, and a qualitative analysis of representative Tweets. This research will add to existing literature by identifying how fearful attitudes are expressed in online forums. Such information can be used to guide online discussions towards a productive dialog that reduces the stress and anxiety associated with the negative consequences of climate change.

Track: Social Justice

When: Monday, October 19 at 11am EST

PANEL: Interdisciplinary Road Maps for Addressing Inclusivity in Applied Settings

Session Chair: Sheila Lakshmi Steinberg (ssteinbe@brandman.edu)

Session Description: Recently there has been an exacerbation of negative social constructs and associated biases about marginalized groups in the United States, in both community and academic settings. Geographers have a history of researching and addressing the spatial context of bias with respect to and associated with race, ethnicity, gender, age, place, and socioeconomic status. The applied geography community, in particular, has an important role to play in addressing the well-being of geographers and highlighting the role that intersectionality plays in the pragmatic application of geography. Current



present examples of bias and inequality and, more importantly, present a road map of ways to adequately address inequality within the field of geography and real-world communities. An open discussion of engagement and dialogue on pragmatic means to apply a road map of inclusivity will follow.

Panelists:

- Lata Murti, Brandman University
- Sheila Lakshmi Steinberg, Brandman University
- Ibipo Johnson-Anumonwo, SUNY Cortland
- Dawna Cerney, Youngstown State University

Track: Social Justice

When: Monday, October 19 at 12pm

WORKSHOP: An Open, Interactive Dialogue on Applying Road Maps for Engaged Inclusivity

Session Chair: Lata Murti (murti@brandman.edu)

Session Description: Drawing from the previous session “Interdisciplinary Road Maps for Addressing Inclusivity in Applied Settings,” this session provides the opportunity to discuss approaches for engaging and empowering diverse populations in multiple settings. Allowing session participants to guide the dialogue, the moderators will respond to questions and comments on applying road maps for engaged inclusivity both in the field of geography and beyond. In this interactive discussion, we encourage participants to share their insights and lived experiences. We recognize the value of lived experience for informing policy and action that promote social justice. Participants will leave the session with practical tools for making change in their respective communities.

Panelists:

- Lata Murti, Brandman University
- Sheila Lakshmi Steinberg, Brandman University
- Ibipo Johnson-Anumonwo, SUNY Cortland
- Dawna Cerney, Youngstown State University, Youngstown, OH

Track: Health

When: Monday, October 19 at 12pm EST

PAPER SESSION: Health Geography, Session 1: Sponsored by Maptitude

Session Chair: Chetan Tiwari (chetan.tiwari@unt.edu)

Session Description: In this session themed health, two papers are presented concerning air pollution. In the first paper, the presenter(s) investigate the relationship between mental health and environmental characteristics, namely air pollution and altitude. In the second paper, the presenter(s) argue that while satellite-derived estimates of air pollution are not as accurate as ground-monitoring stations, satellite estimates can be used to identify and prioritize areas where additional ground monitoring stations need to be established.



There has been a lack of study investigating the relationship between mental health and environmental characteristics, namely air pollution and altitude. The goal of this research is to develop and test improved methods that elucidate the complex relationships between mental health and environmental factors. The present study will test the hypothesis that air pollution is largely responsible for mental health on the basis of cross country studies. Thus, places with higher air pollution level will be more likely to have a higher rate of mental anxiety and depression. Altitude is also another environmental factor that may contribute to the regional variation in mental health. However, little research has been done to investigate the associations between the mental health and these two environmental characteristics. This research will address the research need by doing the following: 1) adapt both Geographically Weighted Regression (GWR) and Geographically and Temporally Weighted Regression (GTWR) to better address the spatial-temporal variation of mental health with respect to air pollution and altitude, and 2) map the coefficient estimates of both GWR and GTWR models presenting relationship between county-level frequent mental distress (FMD) and environmental factors, namely altitude and air pollution and other potential covariates. The analyses will likely to demonstrate how mental is associated with air pollution and altitude in the United States. The findings will propose a need for further investigation into the extent that air pollution and altitude may serve as either a triggering factor or protective factor for mental health and have major implications in our understanding of the etiology of mental health by medical professionals.

Paper 2: Challenges in Assessing Associations between Air Pollution and Health: Gaps in the Spatial Coverage of Air Monitoring Stations in India

Abhishek K Kala, Advanced Environmental Research Institute, University of North Texas
 Chetan Tiwari, Department of Geography & the Environment, University of North Texas
 Samuel Atkinson, Advanced Environmental Research Institute, University of North Texas

Clean air is a critical natural resource for human health. Anthropogenic air pollution is a major public health hazard, with almost 9 million deaths per year worldwide (WHO). India shares a disproportionately high morbidity and mortality burden due to air pollution. The Global Burden of Disease (GBD - 2016) report estimates 2 million premature deaths annually in India due to ambient air pollution (AAP) and household air pollution (HOAP) exposure. This places air pollution amongst the top of all known health risk factors in the country. In India, there is spatial heterogeneity in terms of diverse climatological conditions, environmental awareness, and population density that contribute to the overall air quality of the region. The air pollution exposure risk occurs in both urban and rural populations. However, air quality monitoring is mostly confined to urban areas (Garaga et al., 2018), making it more difficult to understand the nature and distribution of population exposures among those living in rural parts. Although ground monitoring of air pollution is considered most accurate, there exist substantial gaps due to the uneven distribution of monitors across space. Satellite data and remote sensing methodologies can reliably fill these spatial gaps. The pollutant nitrogen dioxide (NO₂) has a short lifetime, which implies it is detected near its source and is often considered a useful proxy for human activities. Tropospheric NO₂ can easily be measured by satellite, and in this study, the spatial distribution of tropospheric NO₂ was derived using Sentinel satellite data. However, satellite-derived measurements are not as accurate as those obtained using ground monitoring stations and should not be used as proxies for guiding public health intervention efforts. We propose that satellite-derived estimates can be used to identify and prioritize areas where additional ground monitoring stations need to be established. We utilized publicly available datasets and conducted our analysis using the open-source Google Earth Engine platform.

Track: Census

When: Monday, October 19 at 12pm EST

PAPER SESSION: Geospatial Data Collaboration and Development in the Americas

Session Chair: Michael Ratcliffe (michael.r.ratcliffe@census.gov)

Session Description: This session highlights collaborative projects to development harmonized approaches to managing and sharing geospatial data in the Americas. Presenters will discuss work occurring among organizations in the Caribbean as well as in South and Central America.



In the current information age, as a fundamental asset for decision-making, the integration of statistical and geospatial information is not an objective to be pursued, but rather a mandatory compliance requirement that allows the facts to be combined in their context. This integration can be approached at different scales: the global one, where the main territorial levels are articulated with the large-scale statistical variables that support the demographic, social, economic and environmental structures of a country; and the local one, in which the basic data associated with the observation units are combined with the spatial aggregations of greater detail, to visualize trends and distributions that allow targeting of follow-up and improvement actions in public policy. In this sense, the National Administrative Department of Statistics - DANE, is an active part of the Statistical and Geospatial Framework of the Americas -MEGA, this being a regional initiative for the articulation of statistical and geospatial information; In addition, it developed the methodology for calculating the vulnerability index for COVID-19 at the block level, which was used by Central America within the framework of the Integration of Statistical and Geospatial Information Project, reflecting the fundamental importance it has for the entity the aforementioned integration, in its mission to generate information for everyone.

Paper 2: CARIGEO: Advancing Geospatial and Statistical Data Collaboration for Regional Decision Making

Alvaro Monett, CEPAL

Michelle St. Clair, Barbados Lands and Survey Department

Linda Peters, Esri

In this presentation, we report on CARIGEO, a collaborative effort among the United Nations Regional Committee on Global Geospatial Information Management for the Americas (UN-GGIM: Americas), the United Nations Economic Commission for Latin America and the Caribbean (UN-ECLAC), public agencies of Member States and Territories with the Caribbean, geospatial private sector organizations, academic institutions and civil society representatives. The CARIGEO project seeks to empower the countries and territories of the Caribbean region to advance the use and sharing of geospatial, statistical and related information to support improved decision making for sustainable national and regional development.

Track: Student Papers

When: Monday, October 19 at 12pm EST

PAPER SESSION: Student Paper Presentations

Session Chair: [Information Coming Soon]

Session Description: Student Paper Presentations

Paper 1: Unhealthy After School Snacks: Socioeconomic Disparities of Food Environments around Public and Private Schools in the United States

Andrea Smith, University of Central Florida

Ting Du, University of Central Florida

This study aims to compare the Food environments (here after FE) around public and private schools in the United States and explore if socioeconomic factors on the school and county levels affect the FEs around schools. School data was obtained from elementaryschools.org, including 75,055 public and 20,427 private schools. Food store data was obtained from the U.S Department of Agriculture website including convenience stores (65,044), small food stores (44,383) and supermarkets/grocery stores (96,652). LISA maps and t test were applied to compare the FEs around public and private schools. Regression models were run to examine the influences of the socioeconomic factors on school FEs. FE around private schools was of lower quality compared to that of public schools ($p < 0.01$). Both school- and county-level socio-demographic factors had significant influences on school FEs. Schools with higher percentages of minority and low-income students tend to have worst FEs ($p < 0.001$). Schools located in counties with high racial segregation, minority percentage, unemployment, poverty rate and low educational attainment tend to



Paper 2: Mapping the Ability of People to be Financial Responsible with their Money: Case Study of Toronto, Canada

Nicholas Pulsone, Ryerson University

Geographers often look for data to better understand economic well-being. However, economic well-being is precarious to define and often is based on singular sources of data, such as household income. One creative way of observing economic well-being on a spatial level is by observing credit-score data. Typically, this data is very hard to come by, let alone be examined at a refined geographical scale. This study examines the use of a financial well-being indicator, that of credit scores, for the City of Toronto at the dissemination level. A dissemination tract is smaller than a census tract and often has around 500 to 1000 persons. The study found that average credit scores in the City of Toronto seem to be increasing and that there is a strong spatial pattern. The arrangement seems to match up with general urban-economic development patterns.

Track: Student Posters

When: Monday, October 19 at 12pm EST

POSTER SESSION: Student Posters

Session Chair: [Information Coming Soon]

Session Description: Student Posters

Poster 1: Census-Tract-Level Crop Risk Estimation Due to Drought, Extreme Cold Temperature, Extreme Heat, Hail, Lightning, and Tornadoes in Louisiana, U.S.A.

Rubayet Bin Mostafiz, Department of Oceanography and Coastal Sciences, College of the Coast & Environment, Louisiana State University, Baton Rouge, LA, United States

Nazla Bushra, Department of Oceanography and Coastal Sciences, College of the Coast & Environment, Louisiana State University, Baton Rouge, LA, United States

Louisiana is one of the most hazard-prone states in the U.S.A. where many people are engaged in agricultural activities. Each year crop is damaged by flood, hurricane, tornadoes, hail, lightning, drought, winter storms, and/or heat waves. Most of the research focused on agricultural losses due to floods and hurricanes. Our research developed a method of crop loss risk assessment due to drought, extreme cold temperatures, extreme heat, hail, lightning, and tornadoes in the future with Louisiana as a case study. This approach improves crop risk assessment in multiple ways as it includes historic and present cropland, the projected change in cropland, present and projected hazard intensity, projected population change along with cropping intensity. Result suggests that agricultural activity are decreasing in the southeast Louisiana, especially in the coastal areas along with northwestern part of Louisiana, and increasing only in some part of northeastern Louisiana. The southwestern part of Louisiana affected mostly by drought, whereas crop loss in the northeast part incurred by extreme heat, hail, lightning, and tornado. In all cases, drought is the costliest among the six hazards. The findings in this study will help decision-makers to protect croplands from future hazards and ensure food security.

Poster 2: Poverty Suburbanization and the Changing Job Accessibility Landscape

Claire Patrick, University of North Carolina at Charlotte

Job decentralization and 'White flight' into the suburbs during the mid 20th century created a concentration of low income and Black residents in US center cities. However, the 1990s brought urban reinvestment and jobs to the cities, pricing out lower-income households to the suburbs. Research suggests that low-income residents have a harder time accessing employment due to fewer jobs and limited public transportation in metropolitan outskirts. However, little is known from the perspective of residents who relocate in terms of experiences they encounter. This study included surveys and phone interviews with eight residents who had both moved beyond the Charlotte city limits to Charlotte MSA suburbs since 2010 and had a yearly income of below \$46,297. Although commute times had increased,



than spatial mismatch. Although the small, all-female sample makes it difficult to create generalizing statements, interviewing low-income residents who have relocated to the suburbs offers a personal perspective on the multi-faceted nature of job accessibility.

Poster 3: The spatiotemporal dynamics of mobility pattern during COVID-19 in the USA and its associations with COVID cases.

Ahmad Ilderim Tokey, University of Toledo

COVID-19 has impacted every aspect of life and this ranges from global to local scale as well as from personal to national level. This led to a great transportation freeze as the highly used modes, in particular, transit and ride-sourcing for having a greater health risk have witnessed a massive decline in its ridership. To this end, this study first aims at to understand the spatiotemporal pattern of mobility indicators that includes transit mode share, trips/person, miles/person, percentage of out-of-county trips, percentage of work and non-work trips and percentage of people maintaining social distance and working from home. The second objective is to examine the spatial association of the above-mentioned indicators with COVID severity. This county-level study encompasses all the counties in the USA. The timeline is basically divided into three parts; before-stay-at-home order (SHO), from SHO to reopening, and after reopening. Regarding the first objective, along with classical pattern mining tools, I used several state-of-the-art spatial tools - space-time pattern mining tools - which enabled to understand the emerging hotspots and time series clusters. While the use of these tools developed a strong idea regarding the spatiotemporal dynamics, only the logical and comprehensive results are presented. Regarding the second objective, Geographically Weighted Regression is used to understand the above-mentioned spatial association as non-spatial modeling doesn't account for spatial autocorrelation. The finding, in total, presents a panorama of the dynamics of mobility in the USA.

Poster 4: A Human Approach to Human Migration: Cartographic Renderings and Ruminations A Human Approach to Human Migration: Cartographic Renderings and Ruminations

Samantha Carr, McGill University

Migration has captured the attention of recent spatial analyses, from the investigation of species movement patterns to visualizations of human migration. Migration and mass movement fascinate us, yet also act as powerful social concepts, placing people into simplified categories of the “domestic” and the “foreign”. Bringing humanity back to reportings of human migration has been a principal focus of National Geographic Explorer Paul Salopek’s recent project. The “Out of Eden Walk” is a slow journalism venture documenting historic human migration routes via a comprehensive on foot odyssey. Central to Paul’s story has been the discussion of migration visually through cartographic renderings. I was inspired by the Harvard Center for Geographic Analysis’ ongoing collaboration with this project to create my own investigation, visualizing human mobility and its implications both regionally and globally. Through this project I aim to provide innovative cartographic analyses to act as an informational lens through which one can engage with current migration patterns and crises.

Track: Social Justice

When: Monday, October 19 at 1pm EST

PAPER SESSION: Social Justice: Communities and Communication

Session Chair: Dawna L. Cerney (dlcerney@ysu.edu)

Session Description: Deeply held beliefs are hard to recognize and cultural norms are so ingrained in a culture that they go unnoticed by many individuals until they are challenged. Identifying bias such as racism, and sexism at removing bias to proved a more equitable environment. Bias has historical legacies that are represented in place names, and action understanding these histories is important. This session examines the history of place names in Bakersfield, Mississippi and the legacy of sexism in geography workplaces with an intent to establish equability



Donato Cruz, California State University, Bakersfield

The killing of George Floyd, and events leading up have forced the nation to recognize Confederate memorials/monuments as symbols of hate intent on glorifying white supremacy and disenfranchise African Americans. Municipalities, corporations, US Military and the state of Mississippi have responded by removing confederate inspired memorials/monuments from their public and corporate spaces. This urgency has however yet to reached the City of Bakersfield, Kern High School and Greenfield Elementary officials to act on addressing one of the highest geographic concentration of officially named confederate iconography in the United States in the nondescript Plantation neighborhood in South Bakersfield, Ca. This session will examine the origins of this community, from the developers, to city public works staff that approved street name such as "Rebel, Plantation, Sumter, Pontiac, Merrimac, etc". The role of school officials had in the founding of Plantation Elementary (1980), South High School (1957) and the selection process for school colors "Blue and Grey"; mascots "Johnny and Jodie Reb"; Dixie as it's school song and use of the confederate flag by drill team and seal embossed on diplomas. Finally, it will also attempt to identify "Other" similar communities in the United States.

Paper 2: Outcomes and Suggestions from 2019 AGC "Gender Concerns in the Geography Workspace" Discussions

Dawna L. Cerney, Youngstown State University

Michael J Allen, Old Dominion University

Clayton J. Whitesides, Coastal Carolina University

Burrell Montz, East Carolina University

Jennifer Burrell, Youngstown State University

A round table discussion titled "Gender Concerns in the Geography Workspace" was conducted at the 2019 Applied Geography Conference. A preceding survey queried Applied Geography Conference listserv members and members of the AAG Applied Geography specialty group, to identify three topical areas of greatest interest for discussion at the round table. This presentation delivers the results of that survey, along with the findings and outcomes of the round table discussion. The round table discussion explored: "Career sabotage: To speak or not speak up on experiencing or being aware of gender bias and inappropriate behavior in the work place;" "Blind spots: How do we recognize and remove individual and cultural blind spots associated with gender concerns? What do we do once these are uncovered and is there recognition of gender issues? What societal and work-world dynamics might this result in?" and "Generation-specific challenges versus ongoing prejudices: Are today's gender issues a function of generation or culture or both?" Suggestions to possible opportunities to address these and other equity-based concerns are also presented.

Track: COVID

When: Monday, October 19 at 1pm EST

PAPER SESSION: Place Based Outcomes of COVID

Session Chair: Jay Lee (jlee@kent.edu)

Session Description: In this second session under the COVID-19 theme we have two papers exploring diversification, resiliency, and rapid detection. In the first paper, the presenter(s) examines the potential benefits of Real Estate Investment Trusts in providing greater resilience against sudden shocks to the market. In the second paper - with the understanding that detecting COVID-19 clusters is vital to alleviating the strain on public health systems - the presenter(s) reports on an analysis of daily county level case data using the prospective space-time scan statistic which had the ability to produce a new set of active and emerging clusters in a timely manner.

Paper 1: REIT Diversification and Resiliency: Evidence from Covid-19

Laine Gambeta, Ryerson University

Evan Cleave, Ryerson University

Real Estate Investment Trusts (REITs) are an equity investment, providing investors with consistent yields



geographically, and economically. While this diversification is typically framed as providing long-term growth, a potential benefit could be providing greater resilience against sudden 'shocks' to the market. This research explores this by examining how 16 Canadian REITs responded to the Covid-19 pandemic between February and August 2020. The response of the REITs following sharp market drops in February and March 2020 (measured by % monthly growth) was compared against different forms of diversification to determine what allowed greater resiliency and a return to a stable market state. Broadly, the findings of this research show that greater diversification allowed for a quicker rebound compared to 'pure-play' strategies (in April and May 2020), with preliminary evidence showing that greater diversification within a REIT portfolio also allowed a quicker return to a steady-state of growth.

Paper 2: Rapid detection of COVID-19 clusters in the United States using a prospective space-time scan statistic: An update

Michael R. Desjardins, Johns Hopkins Bloomberg School of Public Health

Alexander Hohl, University of Utah

Eric M. Delmelle, University of North Carolina at Charlotte

Novel coronavirus disease 2019 (COVID-19), caused by the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), is a pandemic with over 1,216,739 confirmed cases and 72,617 total deaths within the United States. As the number of cases continues to climb, detecting clusters of COVID-19 is critical to alleviate the strain on our public health system through improved resource allocation and decision-making. Here, we report on an analysis of daily case data at the county level using the prospective space-time scan statistic. In previous work, we performed the analysis up to March 27th, 2020 (Desjardins et al. 2020), and here we report updated results as of April 27th 2020, producing a new set of "active" and emerging clusters present. Our analysis resulted in sixteen significant space-time clusters of COVID-19 at the county level in the U.S. during the time span of March 22nd- April 27th. The space-time pattern of significant clusters mirrors active and emerging disease hot-spots at the end of our study period. The statistic can be rerun to support timely surveillance of COVID-19, as demonstrated here. These timely results can inform public health officials and decision makers about where to improve the allocation of resources, testing sites; also, where to implement stricter quarantines and travel bans.

Track: Census

When: Monday, October 19 at 1pm EST

WORKSHOP: Introducing IPUMS IHGIS - Population and Agricultural Census Data from Around the World

Session Chair: Tracy Kugler (takugler@umn.edu)

Session Description: We are delighted to introduce the newest IPUMS project, the International Historical Geographic Information System (IHGIS). IHGIS assembles published data tables from population and agricultural censuses around the world and makes them available through a unified data access system in a consistent structure with high-quality metadata. To make IHGIS possible, we have developed a workflow and supporting software tools to transform data tables from the highly heterogeneous structures in which they are published into a consistent structure suited for data analysis. We also capture metadata describing the datasets, tables, variables, and geographic units and organize them into a coherent database. The IHGIS data access system enables users to select tables of interest and obtain customized data extracts including the selected tables and accompanying metadata. GIS boundary files representing the units described in the tables are also available. IHGIS will facilitate spatial research on population characteristics, demographics, education, employment, crop production, farm structure, and more in countries throughout the world. Like all IPUMS projects, IHGIS data are available free of charge.

Track: Student Papers

When: Monday, October 19 at 1pm EST



Session Chair: Clayton Whitesides (cwhitesid@coastal.edu) and Brandon Vogt (bvogt@uccs.edu)

Session Description: Student Paper Presentations

Paper 1: The stories we tell about geography: The role of syllabi in graduate education

Eden Kinkaid, University of Arizona

In this presentation, we approach syllabi as key sites for understanding and situating debates about geography's history, present, and future. We analyzed syllabi from "introduction to geography" courses in the United States to understand how histories of geography are represented to graduate students. Through this analysis, we identified a recurring narrative about geography: geography is often represented as a "contested discipline." In this presentation, we critically examine the idea of geography as a contested discipline to see what work this narrative does and does not do to shape the histories we teach. On the one hand, this narrative signals an acknowledgement of the breadth and diversity of the discipline; but on the other hand, we find that this narrative fails to critically examine and incorporate ongoing debates in the discipline about its exclusionary past and present. We provide some examples of more and less effective ways to curate a syllabus that is attentive to the contested and power-laden histories of the field. We urge geography instructors to more deeply reflect on the idea of geography as a contested discipline and to examine how exclusions are (re)produced in "introduction to geography" syllabi.

Paper 2: Transit's Effects on Redlined Neighborhoods: Job Dynamics in Historically Disinvested Neighborhoods 2002–2017

Robert E. Hibberd, University of Arizona

We evaluate the recent effects of proximity to Fixed-Rail Transit (FRT) on economic development in redlined neighborhoods, before, during and after the Great Recession, 2002-2017. Discriminatory mortgage-lending practices in previous periods have led to disinvestment and intractable challenges in poor and minority urban neighborhoods. The opening of new transit stations has attracted unprecedented investment in these places. Theoretical conflicts over development have impeded a clear picture of the outcomes of transit expansion in disinvested neighborhoods. Results on the impacts of new investment have varied across metropolitan areas and by transit system modes (commuter rail, light rail, streetcar). In some cases, there has been an ongoing inability to attract needed reinvestment; in others, gentrification-driven displacement of poor residents has occurred. This paper analyzes shifts over time of jobs in redlined zones near light rail transit, using contingency tables and principle components to statistically flesh out the outcomes of transit proximity across the timeline before, during, and after the Great Recession in Dallas, Texas. We hypothesize that station-area outcomes vary by demographic segment of the population, and regional-scale economic strength and growth. Also, neighborhoods in the greatest decline will have attracted the lowest level of investment.

Track: Student Papers

When: Monday, October 19 at 2pm EST

PAPER SESSION: Student Paper Presentations

Session Chair: Clayton Whitesides (cwhitesid@coastal.edu) and Brandon Vogt (bvogt@uccs.edu)

Session Description: Student Paper Presentations

Paper 1: Dual Possibilities: A Case Study of Caribbean Shipwrecks

Ryan Aufdermarsh, Humboldt State University

Digital humanities expanded the ability for information and data to be accessible and understandable. For the public, this meant open, understandable information, while also being a stepping stone for academics to use in further analysis and research. During the 1990s, digital humanities boomed with micro-histories, digital archives of newspapers and articles, maps, videos, info-graphics, and more, providing a multifaceted approach for understanding and discussion. Having the ability to access this level of information is a double-edged sword that provides more access to the public and avenues for academic research while



to create a story map of shipwrecks in the Caribbean during this period and provide open access to both communities. The analysis will shed light on dual possibilities enabled by digital humanities and avenues for a mutually beneficial relationship between the public and the academic world.

Paper 2: Analyzing place preferences through residential satisfaction. Spatial heterogeneity in Latin American cities.

Felipe M. Valdez, Northern Illinois University

The study of residential preferences and choices is still important due to regional differences in housing markets induced by socio-demographic and economic shifts. Cultural shifts such as new family types and lifestyles have broadened the variety of housing behavior. Additionally, most studies focused on the global north cities, disregarding other regions diversity. Consequently, this article aims to identify the level of individual residential satisfaction while identifying any spatial patterns. We present the preliminary results of a cross-sectional survey on housing characteristics and preferences in the city of Quito, Ecuador. We measure the level of satisfaction by both comparing the current and preferred housing and neighborhood characteristics and by the subjective level of satisfaction expressed by individuals. We focus on the level of residential satisfaction as an outcome of the gap between current housing situation and residential preferences. We integrated a traditional housing research approach that focuses on current and future demands for housing, with a multi-attribute value that focuses on the value of each housing characteristic, and a lifestyle method that considers the heterogeneity of housing choices. We aim to capture the effects of place on residential satisfaction by incorporating neighborhood characteristics as a factor determining the level of satisfaction.

Track: Social Justice

When: Monday, October 19 at 2pm EST

PANEL: Creating Social Justice Across Organizations, Companies and Communities: First Steps

Session Chair: Sheila L. Steinberg (ssteinbe@brandman.edu)

Session Description: This session explores the different ways that organizations, companies and communities address issues of social justice in fields related to Geography. People comprise spaces and places yet there is much inequality that exists and there are many lessons to be learned about different forms of inequality and bias. Panelists present the work they are doing in corporate, community and educational arenas to address issues of diversity, inequity and inclusion from a spatial perspective. In a nutshell the context of place and space matter- but is not always considered as a force for change. Panelists come from Dolores Huerta Foundation, Esri, Black Girls Map and Brandman University.

Panelists:

- Sophia Garcia, Dolores Huerta Foundation
- Clinton Johnson, Esri

Track: Posters

When: Monday, October 19 at 2pm EST

POSTER SESSION: Regular Posters

Session Chair: [Information Coming Soon]

Session Description: Regular Posters



Patrick J. Sullivan, Cornell University
Rebecca L. Schneider, Cornell University

Extreme soil degradation is a serious problem affecting grassland ecosystems in the Great Plains, United States and globally. Long-term agricultural practices have resulted in erosion and loss of soil organic matter, with impacts on soil fertility and crop yields. Less recognised has been an associated reduction in soil moisture retention being exacerbated by climate change, with a shift in inter-annual precipitation patterns towards more intense storms and hotter, longer dry periods – presenting a new challenge. Research conducted in Mandan, ND has shown success in restoring degraded grasslands by incorporating coarse woody organic matter into top soils in order to capture and store infrequent rainfall. These woodchips were integrated into the top 20cm of the soil in replicated plots and monitored for soil moisture and temperature throughout the summer of 2015. The data were examined using a Time-Series Model based on the Penman equation and Hartge & Horn Water Content at Field Capacity to describe the relationship of interacting variables on water retention in grasslands soils under shifting precipitation dynamics. Our time-series model includes inputs such as water uptake as a function of precipitation regime and outputs reflecting evaporation rates of different coarse woody organic matter. Saturation level is a function of soil makeup modified by coarse woody organic matter directed at increasing water retention and was used to explore retention time relative to timing and variation of precipitation events. The model successfully captured the process that coarse woody organic matter increases rain capture and soil moisture retention levels in mixed grass prairies of Mandan, ND. The model is providing the basis for evaluating the water saved by reduced irrigation demand and the drought risk reduction in the presence of varying amounts, types and species of coarse woody amendments under a range of rainfall scenarios that may result from the anticipated drier climate.

Poster 2: Building a Regional Tree-Ring Master Chronology for Northcentral Pennsylvania

Lee Stocks, Mansfield University
Kara Grosso, University of Tennessee
Mikailla Nolasco, Mansfield University

Dendrochronology, or tree-ring dating, is a method of matching patterns of annual tree growth in sequences of overlapping core samples from various wood sources, to pinpoint age and analyze regional climate and environmental conditions. Beginning with live tree cores and finding progressively older samples, lengthy chronologies are compiled that can extend backwards for thousands of years. This method is currently used by many archaeologists, climatologists, and environmental scientists in the temperate forests of the world, where trees are responsive to annual variations in climate. This research addresses the lack of an existing chronology in Northcentral Pennsylvania, and aims to collect, analyze, and cross-date tree-ring samples within Tioga County to produce an open-access master database. This data has various research applications including climate change, ecological studies, geomorphic investigations, and measuring pollution. Research agreements with the Department of Conservation and Natural Resources and State Game Commission provide 184,207 acres for sampling. Eastern Hemlocks (*Tsuga canadensis*) were chosen as they are native to this region of Pennsylvania and they have high potential for matching rings, with a Cross-Dating Index rating of two. The decimation of the eastern hemlock by the invasive woolly adelgid throughout Appalachia provides further rationale.

Poster 3: Analysis of Urban Tree Problems Identified by Community Tree Survey of the Village of Homer, NY

Connor Brierton, SUNY Cortland
Christopher A Badurek, SUNY Cortland

This poster reports on outcomes of a multi-day community tree survey as part of civic engagement components of two connected SUNY Cortland courses. In fall 2019, students from the Environmental Remote Sensing and Tree Biology courses conducted a tree survey for the Village of Homer, NY as part of an NSF Common Problems Pedagogy grant. The students jointly collected nearly 1,000 tree data points using the iTree mobile app and GPS units, then created maps and conducted image processing on aerial photography. Students shared their findings in collaborative final presentations, including a species distribution of greater than 56% maples with over 25% invasive Norway maple (*Acer platanoides*) along with non-natives Callery pear (*Pyrus calleryana*) at 3.4% and Norway spruce (*Picea abies*) at 1.7%. Results presented here focus on the spatial extent of the urban tree problems of potential insect damage to maples, power line conflicts, and sidewalk damage.



J. M. Shawn Hutchinson, Kansas State University

Grasslands cover approximately half of the terrestrial earth surface and provide a plethora of environmental benefits and ecosystem services. They have become one of the most changed biomes in the world and therefore, proper monitoring and management of grasslands cannot be overemphasized. Vegetation indices time series dataset based on remote sensing is an effective tool to investigate large-scale vegetation change dynamics. A time-series analysis of Moderate Resolution Imaging Spectrometer (MODIS) 16-day maximum value composite normalized difference vegetation index (NDVI) and Enhanced Vegetation (EVI) data (MOD13Q1 Collection 5) was performed to assess long-term trends in vegetation greenness across the Great Plains ecoregion of the United States. The Breaks for Additive Season and Trend (BFAST) decomposition method was applied to a time series of images from 2001-2017 to derive spatially-explicit estimates of gradual interannual change. Results show more 'greening' trends than 'browning' and 'no change' trends in the study area during the study period. This study is a prerequisite step for future analyses seeking to quantify the influence of climate and soils, along with key regional anthropogenic factors such as fire, on shaping long-term vegetation dynamics.

Track: COVID

When: Monday, October 19 at 2pm EST

PAPER SESSION: Place Based Response: COVID

Session Chair: Jay Lee (jlee@kent.edu)

Session Description: In this first session under the COVID-19 theme, we have two papers exploring adaptations in response to the pandemic. In the first paper, the presenter(s) examines institutional decision-making practices among school administrators to assess how school districts are mobilizing to deliver non-academic services to students and families consider to be among the vulnerable populations. In the second paper, the presenter(s) examines the changes in economic activity across four Great Plains state as a result of the local pandemic responses with the overall goal of contextualizing localized differences in self-regulating behavior.

Paper 1: Assessing Schools as Infrastructure: How Do Schools Shape Adaptive Capacity During the COVID-19 Pandemic?

Sarah Heck, Temple University

Melissa Gilbert, Temple University

Hamil Pearsall, Temple University

Recently, over 80 Native American tribes have banned or disenrolled members of their tribes or denied citizenship to eligible individuals. This phenomenon has received media attention nationwide, and even the term the "disenrollment epidemic" was coined. Many speculate that at least some of it is driven by the greed associated with the multi-million dollar revenues of tribal casinos, which are sometimes distributed in per capita payments to all tribal members. Since a tribe's involvement in gaming might be endogenous, I employ an instrumental variable approach to test whether gaming has been driving disenrollments. In particular, I use machine learning to select an optimal subset of instruments for a Native American tribe operating a casino from the set of potential instruments all meeting the exclusion restriction and associated with the geographical characteristics of reservations, such as their proximity to an MSA, an interstate highway, or a border of a neighboring state with no brick and mortar casinos. I find that a tribe's involvement in gaming causes a large and statistically significant increase in the probability of a forced disenrollment episode but not of a banishment or citizenship denial episode. This paper contributes to the larger literature on club goods.

Paper 2: Pandemic patterns on the plains

Robert Shepard, University of Nebraska

The Port Authority of Allegheny County is the second largest transit agency by ridership in Pennsylvania and the primary provider of public transportation in Allegheny County and the City of Pittsburgh. This



Human Transit: How Clearer Thinking about Public Transit Can Enrich Our Communities and Our Lives by Jarett Walker. Then, a review of the Port Authority's own studies regarding service is conducted. Next, data about features of Port Authority service are collected and analyzed. Finally, a determination of how well the current Port Authority system serves Allegheny County and the trade-offs implicit in the current system are made.

Track: Economic

When: Monday, October 19 at 2pm EST

PAPER SESSION: Economic Geography

Session Chair: Wei Song (wei.song@louisville.edu)

Session Description: This session of the economic theme presents two papers dealing with consumption. In the first paper, the presenter(s) examines student housing costs and the factors driving those costs within the University of North Carolina System using housing data and semi-structured interviews. For the second paper, the presenter(s) - recognizing that consumption is typically constrained by geographic boundaries - explore the use of unique card transaction data as a way to accurately estimate cross-boundary spending flows.

Paper 1: Crisis for the University Student? Examining Student Housing Cost within the UNC System

R. Connor Wood, University of North Carolina at Charlotte (UNC Charlotte)

Claire Schuch, UNC Charlotte

"The cost of higher education has more than doubled in the past three decades, yet university enrollment has increased by 27% from 2000 to 2017. With rising tuition and greater demand for housing close to growing campuses, students' task to find affordable housing options is increasingly more difficult. According to College Data (2018), 40% of the college cost burden is housing. This substantial burden has already forced 36% of college students to be housing insecure and 9% to be homeless (Goldrick-Rab et al, 2018). This study investigates student housing costs and the factors driving them at institutions in the University of North Carolina System using secondary housing data and semi-structured interviews with University Administrators and Housing professionals across the state. Findings suggest an even more uncertain and unaffordable future for an already turbulent student housing market due to changing students, economic complications, the role of the market in university functions & student recruitment, and nationalization forces. Results can begin to inform policy and action that needs to be taken by students, universities, and local leaders to alleviate this crisis. "

Paper 2: The Geography of Consumption and Local Economic Shocks: The Case of the Great Recession

Abe Dunn, Bureau of Economic Analysis

Mahsa Gholizadeh, Bureau of Economic Analysis

Geographic analysis of consumption is often constrained by geographic borders such as counties or MSAs, but economic agents often cross-borders to consume. Using unique card transaction data we estimate across-county spending flows between firms and consumers for every county in the U.S. and for 15 NAICS industries to provide a new consumption-link across counties that has not previously been studied. To demonstrate the importance of this consumption-link, we re-examine the 2007-2009 Great Recession following the work of Mian and Sufi (2013) and Mian, Rao, and Sufi (2014) who demonstrate that those counties with the greatest decline in housing net worth also had the largest declines in consumption and employment. We show that the effect of the housing wealth decline crosses borders to affect consumption and employment in a pattern consistent with our spending flows, even for the non-tradable sector. We find that not accounting for cross-border effects tends to understate the impact of local housing wealth shocks on employment and spending by 26 percent and 17 percent, respectively; and also mis-allocates where those changes are occurring, by about 11 percent for both spending and employment



ROUND TABLE: Doing the Impossible: Perfect* Urban COVID-19 Policy with Imperfect and Incomplete Data

Session Chair: Richard D. Quodamine (Richard.Quodamine@phila.gov)

Session Description: Urban Policy Analysts are used to having a plethora of peer-reviewed data at their fingertips. While we may disagree on the correct policy to implement for any given situation, we're used to having census, economic, and health data at our fingertips. And then, along came COVID-19, a pandemic such as policy makers haven't seen in 100 years, and one in which the situation changes daily. For example, we know travel helped spread the disease, but now we have community spread. We know respiratory droplets are spreaders of the disease, but we don't how long they're infectious for and on what kind of surfaces. We don't know who's most susceptible compared to other similar viruses. We know there's other factors, such as Air quality, poverty, and detrimental health circumstances such as obesity and COPD. But how do we weight them and alleviate what are already pervasive problems in society? Most importantly, how do we balance the needs of maintaining the health of our citizens with the necessity of a functional and growing economy, particularly in a recession? This panel will explore applied research and making policy in an environment where the data is deficient, but the demands on government are anything but.

Track: Economic

When: Monday, October 19 at 3pm EST

PAPER SESSION: Economic Geography

Session Chair: Wei Song (wei.song@louisville.edu)

Session Description: The papers in this first session under the economic theme analyze income related issues in two distinct places in Africa. In the midst of an economic slowdown - brought on by a global pandemic - and the anticipated rise in poverty, the first paper explores the potential for poverty reduction in Ghana through policy initiatives such as the Ghana Poverty Reduction Strategy. The second paper focuses on the Casablanca Metropolitan Area and examines the differential influence income and gender exert on travel behaviors within its boundaries using information extracted from Household Survey data.

Paper 1: The Path to Poverty Reduction in Ghana

James C. Saku, Frostburg State University

Poverty is an endemic problem affecting many developing countries including those in Sub-Saharan Africa. With COVID-19 pandemic and global economic slowdown, the percentage of people experiencing extreme poverty will increase in the years ahead. However, with good policy initiatives and political commitment, this problem can be averted or minimized. To remedy poverty problems in Ghana in the late 20th century, the government implemented poverty reduction strategies (Ghana Poverty Reduction Strategy I and II). Remarkably, these policies led to more than 50% reduction in poverty, from 52.6% to 21.4% between 1991 and 2012. The proportion of people living in extreme poverty also declined tremendously. However, the outcomes were not uniform in the country. Four regional disparities emerged consisting of, top (Greater Accra and Ashanti Regions), bottom (Upper West, Upper East, and Northern Regions), fluctuations (Central and Northern Regions) and consistent decline (Brong-Ahafo, Western and Eastern Regions). Several factors contribute to the north-south variation in poverty incidence. These include remoteness of the north from the southern economic hub and top-down policies that excluded northern rural dwellers from participating in the planning and implementation of these policies. This paper examines the institutional structures of the three-year (2002-2005) Ghana Poverty Reduction Strategy (GPRS). While there are numerous positive outcomes of the policy, a few shortcomings are identified and discussed.

Paper 2: Understanding Gender, Income and Commuting in Casablanca City Morocco

Zineb Chamseddine, Hassan II University of Casablanca

This paper presents the results of the study analyzing the travel patterns of Casablanca City residents



a rise of private vehicle use as the main travel mode. For this study, information from the Household Survey data was used to run statistical analysis allowing the comparison of the male and female core travel components and the analysis of the different influences of gender and income on travel behavior and how it varies across the Metropolitan area of Casablanca. The findings highlight gender disparities in matters of travel behavior that are accentuated by the geographical parameter of residential location.

Track: Student Papers

When: Monday, October 19 at 3pm EST

PAPER SESSION: Student Paper Presentations

Session Chair: Clayton Whitesides (cwhitesid@coastal.edu) and Brandon Vogt (bvogt@uccs.edu)

Session Description: Student Paper Presentations

Paper 1: Understanding the Tribal Disenrollment Epidemic: The Unintended Consequences of the Indian Gaming Policy

Anna Malinovskaya, Cornell University

Recently, over 80 Native American tribes have banned or disenrolled members of their tribes or denied citizenship to eligible individuals. This phenomenon has received media attention nationwide, and even the term the "disenrollment epidemic" was coined. Many speculate that at least some of it is driven by the greed associated with the multi-million dollar revenues of tribal casinos, which are sometimes distributed in per capita payments to all tribal members. Since a tribe's involvement in gaming might be endogenous, I employ an instrumental variable approach to test whether gaming has been driving disenrollments. In particular, I use machine learning to select an optimal subset of instruments for a Native American tribe operating a casino from the set of potential instruments all meeting the exclusion restriction and associated with the geographical characteristics of reservations, such as their proximity to an MSA, an interstate highway, or a border of a neighboring state with no brick and mortar casinos. I find that a tribe's involvement in gaming causes a large and statistically significant increase in the probability of a forced disenrollment episode but not of a banishment or citizenship denial episode. This paper contributes to the larger literature on club goods.

Paper 2: A Case Study of the Port Authority of Allegheny County Transit System

Matthew Brahms, University of Pittsburgh

The Port Authority of Allegheny County is the second largest transit agency by ridership in Pennsylvania and the primary provider of public transportation in Allegheny County and the City of Pittsburgh. This paper assesses the quality of the Port Authority's service from the perspective of a transit rider in Allegheny County and determine various characteristics of the system as a whole. To accomplish this, a set of assessable characteristics that can be assessed for a transit service have been adapted from the book Human Transit: How Clearer Thinking about Public Transit Can Enrich Our Communities and Our Lives by Jarett Walker. Then, a review of the Port Authority's own studies regarding service is conducted. Next, data about features of Port Authority service are collected and analyzed. Finally, a determination of how well the current Port Authority system serves Allegheny County and the trade-offs implicit in the current system are made.

Track: Social Justice

When: Monday, October 19 at 3pm EST

PANEL: Data Driven Social Equity-Using GIS to Empower



Session Description: This session focuses on presenting examples of the important role and race, place, culture and space play in combating racism and inequality. A variety of data-driven examples that highlight community inequality and racial injustice are presented. We explore role of narrative and storytelling to determine public action and policy using GIS.

Panelists:

- Sheila L. Steinberg, Brandman University
- Sophia Garcia, Dolores Huerta Foundation
- Helen Thompson, Esri
- Clinton Johnson, Esri

Track: Transportation

When: Monday, October 19 at 4pm EST

PAPER SESSION: Planes Trains and Automobiles

Session Chair: Harrison Campbell Jr. (hscampbe@uncc.edu)

Session Description: In this session under the transportation theme we have two papers that explore the movement of people and products. In the first paper, the presenter(s) examine the proposed "Ports-to-Plains Corridor" linking Laredo, Denver and Western Canada in order to identify; (1) the underlying policy implications of such a corridor and (2),the emerging political partnerships needed to bring the plan into reality. In the second paper, the presenter(s) examine the factors influencing the preference for train transportation amid a growing economy and an improving transportation network in the Czech Republic.

Paper 1: Ports-To-Plains: A Case Study in Cargo Transport Infrastructure Policy and Planning

Michael S. Yoder, University of Texas, Department of Geography and the Environment

The US, Mexico and Canada form a highly competitive and globally connected regional production platform. The implementation of the USMCA in 2020 emphasizes nearshoring of production from East Asia. As such, policymakers, manufacturing companies, and logistics companies are among the stakeholders advocating improved cargo transportation linkages between the three countries. The proposed Ports-to-Plains Corridor, linking Laredo, Denver and the Western Canadian Plains, is a rather new idea designed to expand cargo transport capabilities west of the dominant I-35 and I-69 NAFTA corridors. Legislation filed in the US House of Representatives this year would pave the way for I-27 to expand beyond its present route in West Texas, to enhance trucking infrastructure, and ultimately to connect Mazatlán to Alberta and Manitoba. This paper explores the underlying policy implications of the corridor and the emerging political partnerships to bring it about. The paper provides a brief identification of the economic geographic regions along the corridor, a discussion of the history of the plan, and commentary on the ways that the corridor is promoted to potential users in the manufacturing, agriculture, and energy sectors. The qualitative research methods involved in the study are described, and the paper concludes that the case study method and open-ended interviews are useful in the sub-discipline of economic geography concerned with cargo transportation policy and development.

Paper 2: Why do Czech commuters choose train for the transportation?

Kristyna Rybova, Jan Evangelista Purkyne University in Usti nad Labem

The mobility of population in the Czech Republic is increasing over the last years. It is supported by growing Czech economy as well as by development and improvement of transportation networks. The Czech commuters broadly prefer individual car transport over public transport modes. To explore the factors that influence the preference of train transportation, a survey on the trains between Prague and Usti nad Labem was conducted. The survey took place in time between October 2018 and September 2019 and almost 300 respondents were questioned. Even though, all the respondents used the train in the time when they were questioned almost one third of them prefer to use car for commuting to work. This situation enables us to compare the factors that are important for decision about preferred transportation



differences in evaluation of importance of selected factors between car and train users are rather small. Factors such as prestige, travel time, time reliability or flexibility were slightly more important for car users. Commuters by train emphasized number of connections, prize, possibility to work on board, safety and habit as crucial factors for the selection of transportation mode. Reduction of travel time between Czech capital and Usti nad Labem was perceived by 60 % of respondents as motivating for more frequent commuting to the other city. The interviewed differ in the foreseen purposes of their journey (work, school, services, culture or sports etc.). The willingness for more frequent travelling was more distinctive among the train users than among car users. Most of the respondents who would not travel more often with the high speed train stated that they have everything they needed in their home town. Nevertheless, the results showed that people are willing to use train more often if it is fast, comfortable and affordable.

Track: Political

When: Monday, October 19 at 4pm EST

PAPER SESSION: Political Geography

Session Chair: Wei Song (wei.song@louisville.edu)

Session Description: Politics plays out in real space. Understanding the drivers to how space is utilized to manage, enhance or limit political action speaks to the power and importance of geography. Legislation introduced with the intent to limit protests has been found to be related to political party, other political conditions and geographic factors. Gerrymandering of electoral districts in order to gain electoral votes by a party is common, but communities are often divided and not truly represented in legislative bodies.

Paper 1: Legislative geographies of anti-protest bills at the U.S. state level

Julie Cidell, University of Illinois

Since 2014, Black Lives Matter and related organizations in the U.S. have deliberately blocked limited-access highways to increase the visibility of their protests and to highlight the already-existing politics of transportation infrastructure. In response, in 2017 seventeen states introduced twenty-one pieces of legislation aimed at stopping such protests, either by increasing criminal penalties, creating new violations, or indemnifying drivers who accidentally hit protestors. While only two of these bills passed into law, they are still of interest for what they demonstrate about state-level legislative responses to protest and for possible future attempts to restrict the locations where protests can take place. This paper address the question of why some state legislators supported these bills by sponsoring or co-sponsoring them while others did not, using logistic regression models. While political party of the legislator was the most important factor, other geographic and political variables mattered as well: the conservatism of voters, the whiteness of the district population, and the presence of an Interstate in the legislator's district. With a second wave of protests in 2020 using limited-access highways across the U.S., understanding who is sponsoring these bills and why is important for future social justice actions.

Paper 2: Split Communities and Unequal Representation: The effects of Texas House of Representatives district boundaries in Houston

Rebecca Theobald, University of Colorado Colorado Springs

Madeline Kresin, Middlebury College

At its core, partisan gerrymandering is the manipulation of electoral districts in order to favor one political party over another. This often results in oddly-shaped districts which are neither compact nor an accurate representation of an area's population. As a result of this partisan gerrymandering, communities of interest are often divided and not truly represented in legislative bodies. Communities of interest are defined here using a number of different characteristics, ranging from race and ethnicity to common physical geography attributes to school districts. This research use geospatial technology analysis tools to examine public data identifying the different ways that communities of interest in the Houston, Texas area are divided across state House of Representatives district lines, the impacts on the services available to district residents, and identifies the communities with the most incongruent representation. Although

**Track: COVID****When: Monday, October 19 at 4pm EST**

PANEL: Strategies for Teaching Online During COVID 19

Session Chair: Sheila L. Steinberg (ssteinbe@brandman.edu)

Session Description: This session presents innovative approaches to teaching the online environment. We share how to create a sense of community in courses and how to effectively engage in real-world applied geographic projects and a variety of GIS projects using a variety hands-on activities. The pedagogy of teaching online, particularly GIS online, coupled with intensive student engagement is a theme throughout the session. Our session is interactive session with participants to help attendees game plan for effective online teaching. Panelists consists of Joseph Kerski and Sheila Steinberg.

Panelists:

- Sheila L. Steinberg, Brandman University
- Joseph Kerski, Esri

Track: Place**When: Monday, October 19 at 4pm EST**

PAPER SESSION: Technology and Active Living

Session Chair: Jay Newberry (jnewber@binghamton.edu)

Session Description: This first session dealing with place presents two papers focusing on places of utility. The first paper concerns the use of mobile apps in national parks and protected areas for promoting geospatial thinking - and by proxy the discipline of geography. The second paper in this second session centered on place explores the use of traditional statistical models and voting records to examine surname types in Ohio. The second paper concerns an examination of temporal patterns with respect to the location and proliferation of active adult communities.

Paper 1: Creating a Digital Wonderland: The Potential of Mobile Apps for Cultural Geography in National Parks and Protected Areas

Yolonda Youngs, Idaho State University

Mobile phones are a common part of visitor experiences in national parks and historic sites. But often these devices are undervalued and overlooked by scholars as tools for enhancing visitor knowledge and communicating geographic scholarship. Mobile applications offer a rich opportunity for applied geography projects. Geographers are well positioned to employ mobile apps that reach out to a public audience by using some of our strongest skills and training in systems-based thinking, landscape interpretation, and geospatial technologies. This paper explores these opportunities through a case study of an innovative mobile application (app) developed for Yellowstone National Park, Wyoming, U.S.A. Drawing on ideas about inductive visualizations and scholarship from situated learning, cultural landscape interpretation, and digital geography, we explore the ways that cultural geographers can help park visitors visualize spatial relationships, environmental histories, and social geographies embedded in cultural landscapes. We focus our work on Yellowstone Lake, the site of some of the oldest tourism development and environmental management in the park. The paper concludes with a discussion of future opportunities for geographers to extend their reach to public and interdisciplinary audiences using citizen science, social media and crowdsourcing techniques in mobile apps for research and cultural site interpretation.



A wealth of geographic phenomenon is captured in xy qualitative data, for example, neighborhood characteristics such as income value or socioeconomic status have been shown to influence criminal behavior, substance abuse, mental health and psychiatric treatment (Sampson et al., 2009). Traditionally, a map can be drawn and evaluated visually, but it becomes unproductive for 1,000,000 values. As initial data, there was a .txt file, where coordinates and user names derived from voting records were processed. Such dataset was chosen as the simplest way to conduct cluster analysis of categorical big data. This study was designed to determine if Ohio state surname types highlighted by their origin using traditional statistical models. The results showed that 4 centroid groups are statistically significant and correspond to the geographic distribution of the historical population of Ohio. The conclusion is that, the proposed approach is suitable for the analysis of large qualitative data by traditional statistical methods, such as cluster analysis.

Track: Transportation

When: Monday, October 19 at 5pm EST

PAPER SESSION: Location and Transportation

Session Chair: Harrison Campbell Jr. (hscampbe@uncc.edu)

Session Description: Spatial analysis is used to determine transportation related conditions, to include examinations of why the state of Ohio is seeing increases in work zone crashes in both 2019 and 2020 despite a statewide stay-at-home order due to COVID-19. Evidence indicates that certain types of crashes and certain locations within a work zone are more dangerous than others. Reduction of automobile dependancy is also spatially analysed through design principles. Evidence indicates that accessibility performance of New Urbanist developments and implementation of four design principles do not meet criteria for New Urbanist ideals to reduce vehicle dependency.

Paper 1: An Analysis of Severe Work Zone Crashes in Ohio, 2015-2019

Rebekka E. Apardian, University of Toledo

Bhuiyan Alam, University of Toledo

In the state of Ohio, 2019 saw a record number of work zone crashes, an increase of about 40 percent from the previous year. These crashes, 6,574 in all, have more than doubled 2014 totals. Work zone crashes in 2020 are currently on pace to set another record high in Ohio, despite a multiple-month long statewide stay-at-home order due to COVID-19 measures resulting in significantly fewer vehicle miles traveled. This paper analyzes the crash characteristics for work zone crashes with the most severe outcomes. The most recent 5-year time period in Ohio is analyzed using data from the Ohio Department of Transportation's crash database (GCAT). The goal of this research is to understand which driver characteristics and which environmental characteristics influence occurrence and severity of work zone crashes. Certain types of crashes and certain locations within a work zone are found to be more dangerous than others. Interactions between crash type and crash location are also found. Additionally, driver characteristics such as age and intoxication are found to play roles in severity levels. Understanding these factors can lead policy change recommendations and targeted safety efforts. This analysis can also help to understand why work zone crashes are increasing at a high rate in the state. As a ubiquitous part of the transportation system, work zone crashes are unique in that they endanger not only vehicle occupants, but also workers who may be present and particularly vulnerable. Outcomes from this research will seek to increase safety for everyone involved in work zones.

Paper 2: Testing Accessibility Performance of New Urbanism Communities in Florida, USA

Sunhui Sim, University of North Alabama

Kathryn Ziewitz, Florida Agricultural and Mechanical University

Jimmy Hilley, Optimal GEO

New Urbanism is believed by some advocates to prevent sprawl and reduce auto-dependency through its design principles. This article focuses on accessibility. The study presented here tested four indicators: distance between new urbanism communities and existing city center, transit service, road



ideals.

Track: Place

When: Monday, October 19 at 5pm EST

PAPER SESSION: Transitions of Place

Session Chair: Jay Newberry (jnewber@binghamton.edu)

Session Description: The first paper concerns an examination of temporal patterns with respect to the location and proliferation of active adult communities. The first paper in this second session centered on place explores the use of traditional statistical models and voting records to examine surname types in Ohio. In the second paper, the presenter(s) uses GIS, historical research, and content analysis not only to measure and analyze physical and social changes in the Oakland neighborhood of Pittsburgh, but also to gauge community sentiment towards the change.

Paper 1: From the Sunbelt to the Frostbelt: Examining the Changing Geography of Active Adult Communities, 1954 - 2020.

Susan Lucas, University of Pittsburgh

Susan Grunewald, University of Pittsburgh

The first active adult community, Youngtown, opened in 1954 in the quintessential sunbelt state of Arizona. Residents of active adult communities stereotypically enjoy endless recreational opportunities in warm sunny places. In this study, data on the characteristics of active adult communities built by the top 10 community builders and a text analysis of select national newspapers is used to examine the temporal patterns in the number and spatial location of active adult communities from 1954 to 2020. The text analysis was carried out using keywords and the named entity recognition (NER) functions of the natural language processing package spaCy in ProQuest. Data on individual retirement communities was collected using a search of community, real estate and builder's websites. The results of the builder analysis show that the number of active adult communities remained low until the 1990s. The majority of active adult communities were built after 1990. The results of both analyses show that active adult communities are clustered in sunbelt states before the 1990s. After the 1990s, active adult communities were constructed across the US. In the 2000s, the newspaper data in particular shows that active adult communities were increasingly constructed close to large urban centers.

Paper 2: Shaping Oakland: The evolution of Oakland's land use and functionality from post-WWII to now

Emilianna Kim, University of Pittsburgh

After WWII, Pittsburgh's future direction swiftly moved away from steelstacks and railroads. Especially in the Oakland neighborhoods where the University of Pittsburgh's campus buildings and medical centers intersect with the local residences, the impacts of the growing 'Eds and Meds' economy are clear to see. At the end of 2019 the University released its 25-year Institutional Master Plan, a sweeping comprehensive vision that sets to improve infrastructure, design, and mobility on campus all while being mindful and protective of the local community. In order to study how land use in Oakland has changed over time, GIS applications and historical research were used to measure and analyze both the physical and social changes in land use since post-WWII. Content analysis of news articles and other sources regarding the Plan was then performed to measure the local community sentiment towards the impending changes. The results of the study concluded that there has been a significant shift in land use and expansion that has increasingly benefitted the University over time, and that the local community is largely distrustful of the Plan due to inadequate community inclusion and empowerment in the decision-making process.

Track: Student Papers



Session Chair: Clayton Whitesides (cwhitesid@coastal.edu) and Brandon Vogt (bvogt@uccs.edu)

Session Description: Student Paper Presentations

Paper 1: Using climate modeling and interdisciplinary theory to analyze climate justice impacts of the Paris Agreement

Shaina Sadai, University of Massachusetts Amherst

The science linking anthropogenic greenhouse gas emissions with our changing climate, and the resulting impacts, has been well established for decades. During that time one of the focal points of international negotiations was to establish a common target for action to address climate change. These negotiations culminated in the Paris Agreement at COP21 in 2015 which seeks to limit the global mean surface temperature (GMST) rise to well below 2C above pre-industrial, and to pursue efforts to limit it to 1.5C. This research seeks to assess the climate justice implications of using global mean surface temperature as a metric for climate action by combining data from ice sheet models and fully coupled global climate model simulations in conjunction with a literature review spanning fields including international relations, political economy, critical geography, and history. Considering the political and scientific history of the development of the temperature target alongside global impacts of climate change we gain a new understanding of spatial, temporal, and procedural aspects of climate justice.

Paper 2: Temperature Variability in the South-central United States and Relationship to Atmospheric Teleconnections

Nazla Bushra, Department of Oceanography & Coastal Sciences, College of the Coast & Environment, Louisiana State University

Local manifestations of global warming are examined through the lens of linear temperature trends and atmospheric teleconnection patterns from 1950 to 2019 over the south-central U.S.A., consisting of Arkansas, Louisiana, New Mexico, Oklahoma, and Texas. Breakpoints that maximize the difference in the slope of time series of surface air temperature are identified for the weather stations within the climate region. The temperature time series are then correlated with indices representing the North Atlantic Oscillation (NAO) and Pacific North American (PNA) pattern, two of the most prominent modes of low-frequency variability in the Northern Hemisphere (NH). Results suggest that both of these teleconnections show strongly significant correlations with surface air temperature except for the last few decades. This study can be extended to other climate regions to observe spatial variability of the temporal temperature trend and their links to these and other decadal and multi-decadal oscillations of atmospheric mass or oceanic temperature.

Track: Place

When: Tuesday, October 20 at 9am EST

PAPER SESSION: Place Preferences 1

Session Chair: Harrison Campbell (hscampbe@uncc.edu) and Michael Ewers (mewers@uncc.edu)

Session Description: How do the characteristics of places influence where people live? What role do place-based social, economic, life cycle/style and environmental factors play in shaping decisions to move to, settle in, or leave from a particular place? Some suggest that the attractiveness of places to the creative class is strongly influenced by amenities, community attitudes and receptivity, strong public services, low crime rates, affordability and livability (Florida 2012; Partridge, 2010). Others have shied away from such assertions, instead emphasizing processes of industrialization and economic specialization which in turn attract skilled workers and fosters localized job creation (Scott 2011, Storper and Scott 2009). Rather than choosing sides in this debate, this session seeks to explore the relationship between preferences and place using real world cases and applications based on, for example: employment and labor markets; health, well-being, quality of life; wages and cost of living; family ties, community attachment, social capital; amenities, recreational opportunities, and/or public services.



Recent research has highlighted the varied and contingent relationship between income and cost of living. By some measures, substantial imbalances between income and cost of living could induce individuals and households to move from less affordable to more affordable areas. However, the decision to move or stay is a complicated one, potentially influenced by dozens of counterbalancing factors. In this paper we examine the importance of geographic differences in cost of living to other variables known to influence migration. We differentiate the mobility patterns of in-migration, out-migration and non-migration while controlling for other place characteristics across 96 U.S. urban areas.

Paper 2: Migration and place preferences: an experimental approach to student migration decision-making

Michael Ewers, University of North Carolina at Charlotte

Bethany Shockley, American University of Sharjah

How do university students evaluate prospective jobs in different cities after graduation? Here we explore the priorities underlying student migration decision-making and the determinants of urban attractiveness using a conjoint survey experiment. Building on research which has established the utility of experiments in evaluating complex migration decision-making, we provided UNC Charlotte students with seven hypothetical city and job packages to consider upon graduation. With each package, we offer randomly combined dimensions and possible values, including city name, salary, taxes, cost of living, rent, crime, pollution and commuting time. We hope that this research can serve as a proof of concept for a larger, more representative survey as well as a model for scholars working on migration and place preferences.

Track: Business

When: Tuesday, October 20 at 10am EST

PAPER SESSION: Emerging Retail: Business and Retail

Session Chair: Tony Hernandez (thernand@ryerson.ca)

Session Description: This session themed “Emerging Retail: Business and Retail” consists of two papers that look at different aspects of emerging retail markets. In the first paper, the presenter(s) study the roll-out of cannabis stores in Ontario, Canada and what role social media played in the public’s response to provincial government messaging. In the second paper, the presenter(s) inquired whether brewer’s spent grain from central Texas breweries could be effectively upcycled into a baking mix for human consumption and how a business doing so might improve local breweries’ sustainability profile while strategically feeding food insecure populations.

Paper 1: The Roll-Out of Cannabis Stores across Ontario, Canada: Social Media Response to Government Policy

Joseph Aversa, Ryerson University

Tony Hernandez, Ryerson University

Jenna Jacobson, Ryerson University

Evan Cleave, Ryerson University

With Canada becoming the first of the G20 countries to legalize the recreational use of cannabis, there has been increasing interest in the emergence of this new retail market. With every province and territory in Canada having the choice to decide what the sale of cannabis will look like, there are growing questions and concerns about the potential implication surrounding these decisions. Media attention has mostly focused on the rules and regulations that will govern the provincial licensing and roll-out of cannabis stores across Canada. However, there has been limited research focusing on Canadian's response to the cannabis legalization policy and the geographic differences in cannabis supply at the provincial level. This paper utilizes social media analytics to investigate tweets mentioning Ontario Cannabis Stores. This research has two main objectives: (i) to identify the nature of provincial messaging regarding cannabis legalization and roll-out; and, (ii) to identify the public's response to provincial government messaging.

Paper 2: From Brewer to Baker: Transformative Praxis through Upcycling Brewers’ Spent Grain

Delorean S. Wiley, Texas State University

Colleen C. Myles, Texas State University



brewers' waste. Brewers' spent grain (BSG) is the largest by-product of brewing and can be a burden for breweries seeking to be(come) more sustainable. As breweries strive to increase their operational efficiency and come closer to a zero-waste production cycle, processes for repurposing BSG become appealing. Sustainable waste management can also help to address other social issues, like hunger. Using a transformative praxis approach, wherein a business plan using BSG for a safe and marketable food product in Central Texas was created, and a test business launched, this research inquired whether BSG from central Texas breweries could be effectively upcycled into a baking mix for human consumption and how a business doing so might improve local breweries' sustainability profile while strategically feeding food insecure populations. The findings indicate that BSG can be successfully repurposed into a baking mix, and the test business showed the potential for profit, but there are some limitations (environmental, economic, regulatory) that make it difficult to bridge brewers and bakers in this way.

Track: Education

When: Tuesday, October 20 at 10am EST

PAPER SESSION: Geography and Interdisciplinary Educational Experiences Abroad 1

Session Chair: Clayton Whitesides (cwhitesid@coastal.edu) and Dominique Cagalanan (dcagalana@coastal.edu)

Session Description: Geography is well equipped to provide internationalized curriculum through interdisciplinary educational experiences abroad. Researching and studying abroad are germane to and established traditions of the discipline. Because study abroad is inherently interdisciplinary and disciplines across the natural and social sciences and humanities increasingly tackle contemporary challenges that transcend disciplines, potential exists for geographers to partner with departments from virtually all colleges across a given campus to provide cross-cutting, interdisciplinary experiences abroad. To be effective, however, this necessitates better communication between disciplines to highlight synergies and underscore benefits, rather than each discipline functioning in their own silos on parallel paths. The purpose of this session is to highlight effective and successful Geography educational experiences abroad that have partnered with other disciplines. We intend to solicit presenters from those who are contributing to a special issue of The Geography Teacher that Cagalanan and Whitesides are guest-editing on this topic.

Paper 1: A Global Educational Experience between Geography and Nursing: Interdisciplinarity and Sustainability
Stavros Constantinou, The Ohio State University
Dianne Morrison-Beedy, The Ohio State University

The purpose of this paper is to present an interdisciplinary model of education abroad in Cyprus. This unique educational opportunity allows undergraduate students from across several campuses to achieve three goals: (1) to enhance their global perspective by participating in an Education Abroad experience, (2) to participate in an interdisciplinary learning experience between geography and nursing, and (3) to fulfill the proposed university general education thematic requirements which focus on sustainability. The United Nations Sustainability Development Goals, focused on Cyprus as a case example, provide a common theme for interdisciplinarity. This transformational educational experience provides students with a "team lens" drawing upon targeted field trips throughout the island, interdisciplinary projects between the two fields of study, and the opportunity to live and learn together within a foreign country.

Paper 2: Integrated international field trips maximize accessibility and preserve learning value in an age of uncertainty
Dominique Cagalanan, Coastal Carolina University
Clayton J. Whitesides, Coastal Carolina University

Study abroad has benefits but also challenges associated with cost, time, and feasibility for a student's degree program. Integrating international field trips into semester-long courses may provide opportunities that mitigate these challenges and make study abroad more accessible. Based on preparations for a spring break field trip to the Philippines, integrated international field trips can allow for targeted recruitment,



Track: Health

When: Tuesday, October 20 at 10am EST

PAPER SESSION: Health and the Environment

Session Chair: Kari Northeim (karinortheim@my.unt.edu)

Session Description: The geography of environmental indicators and health is complex and dynamic. Understanding spatial variability in exposure risk and associated health outcomes requires the use of new data sources and the development of novel methods for analysis. This session comprises of papers that focus on methods to map environmental indicators such as air pollution and to assess their impact on human populations. This research seeks to promote the importance of spatial perspectives, including scale, in environmental health.

Paper 1: Health Fragility and Vulnerability From Environmental Pollution

Kari Northeim, University of North Texas

The negative effects of air pollution on human health are implicit, but the differential effects on vulnerable populations remain unclear. In addition, it is unknown if air pollution monitoring policies and placement strategies are spatially adequate to assess personal health exposures. Moreover, due to a lack of pollution monitoring data based on where they live, vulnerable and undeserved populations health risks may be underrepresented. This paper evaluates the ozone air pollution-monitoring network in Dallas – Fort Worth (DFW) by assessing the active spatial scale and deriving the monitored surface using spatial representativeness and the Environmental Protection Agency's (EPA) coverage thresholds. Using socioeconomic data and social determinants of health, it contends that although significant strides have been made, the current pollution sensor network is unable to capture environmental pollutants threat to fragile community's public health.

Paper 2: "Who give you belle?": Understanding the structural drivers of Teenage Pregnancy in Nigeria

Tolulope Osayomi, Department of Geography, University of Ibadan, Ibadan, Nigeria

Ayodimeji Jonathan Orelusi, Department of Geography, University of Ibadan, Ibadan, Nigeria

Teenage pregnancy is a growing demographic concern worldwide. Most of these teenage pregnancies occur in low and middle income countries including Nigeria. Several research have focused on individual-level factors associated with teenage pregnancy but very few have emphasized on the structural drivers of teenage pregnancy. Thus, the study views the geographical distribution of this social problem in Nigeria from a structural perspective. The central question of the study is to what extent do societal conditions shape teenage pregnancy in Nigeria? The source of the data used for this research were the National Demographic and Health Survey report of 2018, Annual Abstract of Statistics report of 2012 and 2016 and State of States report 2018. The statistical and spatial tools employed to analyse the data were global Moran's I, Local Getis Ord, Pearson correlation and stepwise regression. Teenage pregnancy hotspots were widespread across northern Nigeria. Results also pointed out that poverty and illiteracy among women were the major drivers of teenage pregnancy in Nigeria. The study recommends that poverty eradication and women education should be a priority of the State so as to reduce the prevalence of teenage pregnancy in Nigeria.

Track: Student Papers

When: Tuesday, October 20 at 10am EST

PAPER SESSION: Student Paper Presentations

Session Chair: Clayton Whitesides (cwhitesid@coastal.edu) and Brandon Vogt (bvogt@uccs.edu)



Paper 1: What is Proper Place? Perceptions of High Schools in Lincoln, Nebraska

Morgan Ryan, University of Nebraska-Lincoln

Place is the human and nonhuman cocreation of the culture and context of space. Perception of place therefor is the assumptions, positive or negative, ascribed to areas of everyday life in which individuals interact, work, or learn. Historically, poverty and race have played a significant role in determining the perception of a neighborhood or community. This research paper will take a critical look at the different perceptions of the neighborhoods surrounding the high schools in Lincoln, Nebraska. To look at perception of place, a survey was given to individuals to see which schools they identified as “good” and “bad”. Through the composition and analysis of both qualitative and quantitative data, this paper aims to identify if there is a connection between poverty, race, and negative perception of the schools in the different areas of Lincoln.

Paper 2: Exploring Local Heterogeneity in Social Vulnerability using Geographically Weighted Principal Components Analysis (GWPCA)

Gainbi Park, University of Wisconsin-Milwaukee

Social vulnerability index (SoVI) has been widely used to measure the extent to which people or places are socially vulnerable. The SoVI is computed as an aggregate index that linearly combines a few principal components resulted from the principal component analysis (PCA) on a number of selected social variables, and it can quantify the relative level of social vulnerability but cannot indicate the heterogenous local social conditions that contribute to the vulnerability in various degree. The specific local social conditions that either attenuate or amplify local social vulnerability is of much need in policy-making to reduce local vulnerability. This study explores the heterogeneity in the components and local social conditions of social vulnerability by using the geographically weighted principal components analysis (GWPCA), and it also investigates how the local heterogeneity in the vulnerable social conditions has evolved over time and across the Greater Houston metropolitan area in the United States. It found that the SoVI exhibits persistent spatial patterns in the study area, and the major contributing variables can vary from time to time, but the disadvantages in economic condition, education attainment, and family structure have appeared to be prominent factors to high social vulnerability.

Track: Place

When: Tuesday, October 20 at 10am EST

PAPER SESSION: Place Preferences 2

Session Chair: Harrison Campbell (hscampbe@uncc.edu) and Michael Ewers (mewers@uncc.edu)

Session Description: How do the characteristics of places influence where people live? What role do place-based social, economic, life cycle/style and environmental factors play in shaping decisions to move to, settle in, or leave from a particular place? Some suggest that the attractiveness of places to the creative class is strongly influenced by amenities, community attitudes and receptivity, strong public services, low crime rates, affordability and livability (Florida 2012; Partridge, 2010). Others have shied away from such assertions, instead emphasizing processes of industrialization and economic specialization which in turn attract skilled workers and fosters localized job creation (Scott 2011, Storper and Scott 2009). Rather than choosing sides in this debate, this session seeks to explore the relationship between preferences and place using real world cases and applications based on, for example: employment and labor markets; health, well-being, quality of life; wages and cost of living; family ties, community attachment, social capital; amenities, recreational opportunities, and/or public services.

Paper 1: Three Towns, One County: Experiences of the Columbiana County (OH) Landbank

Robert Richie

Tad Harold

Columbiana County, Ohio is both physiographically and culturally diverse. Much of the culture and historic economy is drawn sharply by the Appalachian plateau topography which is ether glaciated or unglaciated. Forty years of economic transitions, in this primarily rural and working class county, have resulted in



Track: Place

When: Tuesday, October 20 at 11am EST

PAPER SESSION: Urban City Perceptions

Session Chair: Harrison Campbell (hscampbe@uncc.edu) and Michael Ewers (mewers@uncc.edu)

Session Description: This third session centered on place presents two papers exploring place potential. In the first paper, the presenter(s) analyzes the barriers residents might face with tree planting and urban greening trends in Philadelphia. In the second paper, the presenter(s) examines how middle-income renters reconcile the desirability of a place with the affordability of that place in New York City.

Paper 1: Barriers in Urban Tree Planting Initiatives in Philadelphia, PA

Elizabeth Riedman, Temple University

Urban tree cover is particularly low in low-income areas in American cities, leading to increased temperatures for vulnerable residents. Tree planting programs aim to address this gap in tree cover, however a lack of resident participation can prevent tree canopy levels from rising. This research aims to better understand the barriers that residents may face in planting trees or getting involved in current urban tree planting efforts, with a focus on communities with the greatest need for urban greening initiatives in Philadelphia, PA. Working in collaboration with the Pennsylvania Horticultural Society (PHS), twenty in-depth interviews were conducted remotely with various community leaders around North Philadelphia. Findings reveal residential fears regarding the long-term cost and maintenance of older, larger trees, as well as the need for further education regarding the benefits of tree plantings. This research highlights the importance of integrating resident perspectives into tree cover initiatives from both city governments and nonprofit groups alike to ensure equity and inclusion.

Paper 2: Desirability, Affordability, and Knowledge of Place: evidence from middle-income renters in New York City

Rebecca M. Shakespeare, Tufts University

Common sense suggests that housing price and household budgets inform where people can afford to live or move to. But how do people associate desirable neighborhood characteristics with their financial ability to move to them? This paper examines how middle-income renters in New York City assess areas of the city as desirable places they could afford to live. Using interviews and sketch-mapping, this paper focuses on how renters express the qualities of desirable places to live and how they know areas of the city are affordable. This paper applies Yi-Fu Tuan's framework of knowledge and experience of place as a conceptual framework to analyze on how expressed knowledge of places in the city related to renters' assessments of them. This paper finds that desirable and affordable places were described with specific details, demonstrating knowledge of places and housing prices. Desirable but unaffordable places were so classified because their desirable attributes rendered them unaffordable. However, affordable but undesirable areas were often only vaguely described, conceptually linking affordability with lack of knowledge and often negative qualities. This suggests that experience and knowledge informs which places a household would consider living or moving to.

Track: Business

When: Tuesday, October 20 at 11am EST

PAPER SESSION: Advantage of Space and Place

Session Chair: Tony Hernandez (thernand@ryerson.ca)



paper, the presenter(s) examine how the 20 finalist cities to host Amazon's second headquarters positioned themselves to secure the HQ.

Paper 1: Public space as a factor of competitive advantage of the High Street. Oxford city centre example
Dorota Celinska-Janowicz, University of Warsaw, Euroreg

Since at least a decade the increasing competition of e-commerce and out-of-town retail, as well as rise of the convenience culture among the consumers, undermine the position of the High Street in the UK urban retail landscape. The recent pandemic has only worsened the situation. Despite these negative processes the High Street is still alive and one of the reasons are its competitive advantages related to, among others, public space and public realm. The aim of the paper is to present the role of public spaces in creating this advantage on the example of the Oxford primary shopping area. The research is based on the survey conducted in Oxford at the beginning of 2019. The results confirm the positive role the public space can play in creating the competitive advantage of the High Street, especially in comparison to the e-commerce, although the relationships between consumers opinions and behaviours are not always direct and straightforward. Based on the results several recommendations for the retailers and policymakers in the area of city centre management were formulated. The research results and recommendations were also confronted with the new realm created by the COVID-19 pandemic.

Paper 2: Selling the city: Place branding, place promotion and the Amazon HQ2 competition
Evan Cleave, Ryerson University
Joe Aversa, Ryerson University

In September 2017 Amazon released a call for proposals to "kick off" a competition to select a site for their second corporate headquarters ("HQ2"). For cities, this was a potential 'game changer' represented a major opportunity to enhance their local economy. At least 238 cities from across North America provided responses to Amazon, presenting information about their locales to position themselves against other places in the competition, attract Amazon's attention, with the ultimate goal of investment. In essence, the Amazon HQ2 competition became an exercise place branding and promotion. Place brands are the network of associations in the mind of a target audience, created through the attenuation of the local attributes that comprise this network. This not only provides insight into how cities were jockeying for Amazon's attention, but also into the way prominent cities in North America 'see themselves' and want to be seen. Through a comprehensive content analysis of bid response documents, this paper explores how the 20 finalist cities positioned themselves. While neoclassical economic elements were present in the promotion efforts, there were also "softer" social, behavioural, and place factors that were prominent features in the cities' efforts to "sell" themselves to Amazon.

Track: Education

When: Tuesday, October 20 at 11am EST

PAPER SESSION: Geography and Interdisciplinary Educational Experiences Abroad 2

Session Chair: Clayton Whitesides (cwhitesid@coastal.edu) and Dominique Cagalanan (dcagalana@coastal.edu)

Session Description: The purpose of this session is to highlight effective and successful Geography educational experiences abroad that have partnered with other disciplines. We intend to solicit presenters from those who are contributing to a special issue of The Geography Teacher that Cagalanan and Whitesides are guest-editing on this topic.

Paper 1: Interdisciplinary Study Abroad: The Fruits of Two Traditions
Daniel P. Dugas, New Mexico State University
Eric Morgan, New Mexico State University

Through New Mexico State University's Office of Study Abroad, Faculty-Led International Programs we



the collaborating faculty team include cross-discipline interaction and enrichment, mutual support and backup, and dynamic feedback. Students demonstrate knowledge and the application of skills concerning cultural observation, cultural landscapes, and acculturative experiences. In-country student interactions included homestay and an extensive list of nationally recognized experts. Our interdisciplinary concordant course design greatly enhances the trip's purpose, and student participation and learning. Because of the universal nature of the design, its use is appropriate anywhere students are abroad in the world.

Paper 2: A Survey of Interdisciplinary Educational Experiences Abroad in Geography

Clayton Whitesides, Coastal Carolina University

Dominique Cagalan, Coastal Carolina University

Geography is well equipped to provide internationalized curriculum through interdisciplinary educational experiences abroad. Undergraduate geography students surveyed 213 geography programs in the United States to identify disciplines partnering with geography in short-term, faculty-led study abroad opportunities. Only 42 opportunities, offered by 31 departments, were identified. Ten of the abroad opportunities partnered with a single discipline, one partnered with four disciplines, and 31 had no disciplinary partner. Undoubtedly, more geography experiences abroad exist than what was found. These findings suggest there are missed opportunities for interdisciplinary geography programs abroad and highlight the need for better advertising when targeting undergraduate geography students.

Track: Modeling

When: Tuesday, October 20 at 11am EST

WORKSHOP: Fast Track Your Data Extraction Experience with AppEEARS!

Session Chair: Danielle Golon, Innovate Inc, Contractor to the USGS (dgolon@contractor.usgs.gov)

Session Description: Searching, downloading, and transforming geospatial data to make it right for your project takes way too much time! NASA's Land Processes Distributed Active Archive Center (LP DAAC) has developed an intuitive, no-cost web application that will do most of the work for you! This presentation will show you how to access and explore geospatial data from multiple federal archives using the Application for Extracting and Exploring Analysis Ready Samples (AppEEARS). AppEEARS provides access to over 120 no-cost geospatial data products that cover a range of variables including elevation, fire, population, precipitation, reflectance, snow cover, surface temperature, vegetation data, and more! With AppEEARS you are able to subset, mosaic, reproject, and examine data and data quality information over your study area through charts and graphs without needing to download a single byte of data to your machine. Prefer analyzing the data yourself? Bulk download your analysis ready outputs as csv, GeoTIFF, or NetCDF4 format to get started. Sound too good to be true? Attend this talk to watch AppEEARS in action!

Track: COVID

When: Tuesday, October 20 at 11am EST

ROUND TABLE: Academia in the Covid-19 Era: How Programs and Departments Must Address and Adapt

Session Chair: Patrick Lawrence (patrick.lawrence@utoledo.edu)

Session Description: This round table discussion will focus on the various aspects and impacts associated with Covid-19 to Geography Department and Programs. Topics will include degree programs, curriculum and courses, budget and resources, research activities, impacts to graduate students and faculty, operations, health and safety, morale, plus associated issues, concerns and questions. The aim is to present an overview of the challenges and suggest best practices and approaches to address. Highlights of



Track: Business

When: Tuesday, October 20 at 12pm EST

PAPER SESSION: Retail Landscapes: Business and Retail

Session Chair: Tony Hernandez (thernand@ryerson.ca)

Session Description: This session themed “Retail Landscapes: Business and Retail” consists of two papers that look at retail trends in Canada. In the first paper, the presenter(s) study the adverse impacts on small businesses when large, “big box” retailers move into an area. In the second paper, the presenter(s) find that in response to the growth of online shopping, shopping center space in Canada is undergoing a wave of transformation with widespread redevelopment, adaptive re-use and mixed-use development as the emerging real estate trends.

Paper 1: Refashioning the Contemporary Retail Landscape: A Canadian case study.

Brian Ceh, Ryerson University

Tony Hernandez, Ryerson University

The market place is comprised of small and larger retailers that compete for a finite number of customers. Competition between small and large retailers can enhance the retail landscape. However, when a crowding-out-effect takes place at the local level the retail landscape can be significantly impacted. This study examines this relationship using Canadian retail data during the past few years for a mid-sized Canadian city. It is shown that when a large retail chain moves into a community there are some adverse impacts on local retail activity. Additionally, when several box-stores locate within a community the impact is magnified, resulting in adverse outcomes. Not only are local retailers crowded-out by the larger invading retail chains, but that retail vacancies also increase. It is expected that as online retailing escalates this will only magnify the outcomes detected in this study. In other words, large retailers will not need to build brick and mortar as a way to phase out smaller independent retailers. As such, the findings in this study are anticipated to only magnify in the years to come.

Paper 2: The Redevelopment of Shopping Centres amid Retail Disruption: Evidence from Canada

Tony Hernandez, Ryerson University

Online retailing and associated omnichannel shopping behaviours have widely led to the media heralding a new era for the shopping centre industry - the retail apocalypse. While there is no clear consensus as to the future for retail, the prevailing storyline, largely from the US and Europe, has been framed as the death of the mall, with virtual digital shopping channels replacing physical brick-and-mortar stores. Retailers and service firms have been reassessing the space needs of their store (offline) networks and, in turn, shopping centre landlords, owners, commercial real estate developers and investors have had to re-examine the scale, function and form of the commercial spaces within their property and investment portfolios. This paper delves beneath the sensationalist headlines and examines the actual changes taking place within shopping centre industry within Canada. Based on a preliminary data-gathering exercise, the shopping centre inventory and planning data presented highlights that shopping centre space in Canada is undergoing a wave of transformation with widespread redevelopment, adaptive re-use and mixed-use development as the emerging real estate trends. The paper concludes by discussing future trajectories for the shopping centre industry in Canada.

Track: Education

When: Tuesday, October 20 at 12pm EST



Session Chair: Clayton Whitesides (cwhitesid@coastal.edu) and Dominique Cagalanan (dcagalana@coastal.edu)

Session Description: Geography is well equipped to provide internationalized curriculum through interdisciplinary educational experiences abroad. Researching and studying abroad are germane to and established traditions of the discipline. Because study abroad is inherently interdisciplinary and disciplines across the natural and social sciences and humanities increasingly tackle contemporary challenges that transcend disciplines, potential exists for geographers to partner with departments from virtually all colleges across a given campus to provide cross-cutting, interdisciplinary experiences abroad. To be effective, however, this necessitates better communication between disciplines to highlight synergies and underscore benefits, rather than each discipline functioning in their own silos on parallel paths.

Paper 1: Geography and the Study of Spanish in Spain

Jose Torres, Weber

Studying a foreign language is not just about translating words from one language to another. It also includes learning about the cultures that are linked to the language, and an effective way to understand those cultures is to incorporate learning about a country's human and physical geography in a language-based educational experience abroad. In the case of Spain, a study of human geography topics such as migrations, urban and built environments, and religion and culture, combined with topographical features that served as barriers or as facilitators to human geography activities, helps explain European Spanish language features.

Paper 2: Teaching Historical Geography through French Landscapes

Philip Whalen, Coastal Carolina University

Dominique Cagalanan, Coastal Carolina University

This presentation discusses a ten-day, study-abroad trip to France that focused on landscapes to explore heritage production as the outcome of tensions between modernization and preservation across space and over time. We assigned the same readings to all students- geography and history majors alike- and co-taught all field lectures. This promoted group cohesion and underscored the entangled contributions that geographical and historical vectors contribute toward landscape and heritage production. We examined the role of humans in shaping built and natural environments, landscapes as material and symbolic with meaning produced at various scales, and the [often purposefully designed] sensorial and affective experiences of people in landscapes. The course facilitated student learning through the levels of Bloom's taxonomy: understanding the concepts above and applying them to components of landscapes; analyzing landscapes at broader spatial scales as complex systems that integrate diverse components; and evaluating how landscapes are curated, politicized and contested.

Track: Careers

When: Tuesday, October 20 at 12pm EST

PANEL: Careers in Industry Panel

Session Chair: Claire Burch (burchcm@ou.edu)

Session Description: This session will consist of a panel of six individuals currently working in various industry positions. The purpose of this session is to provide students an opportunity to ask questions related to jobs in industry, including sectors such as natural resource management, real estate, and emergency and risk management planning. Panelists will also include individuals from city and federal government organizations.

Panelists:



- Linda Peters, Esri, Business Development
- Amanda Rumsey, Geographer, Address and Spatial Analysis Branch of the U.S. Census Bureau
- Maurice Cruz, New Mexico Tribal Liaison South Central Climate Adaptation Center
- Peter Bonsall, National Park Service National Trails Program Specialist
- Candice Luebbering, GIS Certification Institute

Track: Student Papers

When: Tuesday, October 20 at 12pm EST

PAPER SESSION: Student Paper Presentations

Session Chairs: Clayton Whitesides (cwhitesid@coastal.edu) and Brandon Vogt (bvogt@uccs.edu)

Session Description: Student Paper Presentations

Paper 1: The Effects of Renewable Energy, Economic Growth, and Fossil Fuels Consumption on Carbon Emissions: An empirical study on Ontario

Idris Ali, Ryerson University

Brian Ceh, Ryerson University

Mohammad Salahuddin, Trent University and George Brown College

This study attempts to investigate the relationships of carbon emissions with renewable energy, fossil fuels consumption and economic growth using data for Ontario province of Canada for the period from 1981 to 2018. After performing a battery of diagnostic tests, this paper applied Autoregressive Distributed Lag (ARDL) model to estimate the long-run and short-run coefficients of the independent variables on the dependent variable. Empirical findings suggest that there are significant long-run and short-run negative effects of renewable energy, hydroelectricity, nuclear power, solar energy, wind energy, and biomass energy on carbon emissions. On the contrary, fossil fuel consumption, refined petroleum products, natural gas and economic growth have both long-run and short-run positive effects on carbon emissions. Toda-Yamamoto causality test was also performed to find the direction of causality between the variables. Results revealed that there are unidirectional causal link running from carbon emissions to total renewable energy, hydroelectricity, petroleum products, nuclear power and from solar energy, wind energy, and biomass energy to carbon emissions. Bidirectional causal links is also observed between economic growth and carbon emissions, and between natural gas and carbon emissions. Policy implications are discussed.

Paper 2: Determining the Sustainability of Cities: Fallacies and Accurateness.

Damon Recagno, Ryerson University

A concern has arisen about the numerous rankings of sustainable, green and smart cities in various publications. Different publications are producing vastly different results. If a consistent and legitimate set of measures were being adopted by various researchers, there would be commonality among the rankings. However, this does not seem to be the situation. As such, this study explores the credibility of the published rankings of cities as to whether they are sustainable, green, or smart. The findings show that the majority of the rankings of sustainable, green and smart cities are diverse and employ questionable techniques. Sources that publish such rankings seemingly compile random lists of cities with no research having taken place. A survey helped establish some criteria by which to rank cities so as to create more consistent results

Track: Miscellaneous

When: Tuesday, October 20 at 12pm EST

PAPER SESSION: Migration & Decision Making



causes and impacts. The first paper looks at identifying the underlying priorities college students assign to place in anticipation of their post-graduation migration. In the second paper, a novel algorithm is posited for determining the temporal lag between population growth (of which migration contributes to) and urban expansion.

Paper 1: Migration and place preferences: an experimental approach to student migration decision-making

Michael Ewers, University of North Carolina at Charlotte

Bethany Shockley, American University of Sharjah

How do university students evaluate prospective jobs in different cities after graduation? Here we explore the priorities underlying student migration decision-making and the determinants of urban attractiveness using a conjoint survey experiment. Building on research which has established the utility of experiments in evaluating complex migration decision-making, we provided UNC Charlotte students with seven hypothetical city and job packages to consider upon graduation. With each package, we offer randomly combined dimensions and possible values, including city name, salary, taxes, cost of living, rent, crime, pollution and commuting time. We hope that this research can serve as a proof of concept for a larger, more representative survey as well as a model for scholars working on migration and place preferences.

Paper 2: Consumption Zones as an Alternative to Commuting Zones

Abe Dunn, Bureau of Economic Analysis

Andrea Batch, Bureau of Economic Analysis

Mahsa Gholizadeh

Jeff Cheny

Mei-Po Kwan, Department of Geography and Resource Management, and Institute of Space and Earth Information Science, The Chinese University of Hong Kong

Commuting (CZs) zones are a standard for evaluating labor market activity in the United States for the entire country, even in regions outside metropolitan areas. However, they are not the most appropriate spatial clusters for other economic activities, including household consumption. As an alternative, we propose "Consumption Zones (ConZs)", which clustered based on spending flows across consumer residence and merchant location, comparable to the CZ approach that groups counties based on employee residence and employer location. ConZs offer an alternative definition of a "market" that can give us information on county regions where people consume goods and services... To create ConZs clusters, we use a unique data source of card transactions from Fiserv, one of the largest card transaction intermediaries in the country. We introduce consumption zones as an alternative to commuting zones for analysis of household consumer activities, and present a method for economic zone configuration comparison that can be applied to any pair of dissimilar spatial cluster sets. Finally, we present cases in which consumption zones would have been the more appropriate spatial clusters for measurement of economic activity from existing literature, and reevaluate their findings using consumption zones.

Track: Business

When: Tuesday, October 20 at 1pm EST

PAPER SESSION: International Retail: Business and Retail

Session Chair: Sina Hardaker (sina.hardaker@uni-wuerzburg.de)

Session Description: This session themed "International Retail: Business and Retail" consists of three papers that look at the international expansion of (mainly) grocery stores. In the first paper, the presenter(s) study hybrid market entry strategies of Costco as it entered Chinese markets. In the second paper, the presenter(s) examine how German-owned Aldi grocery chain has adapted and reinvented itself as it entered Chinese markets. The third paper determines that shopping centers in a region of Nigeria are clustered to better understand the factors influencing the siting of shopping centers there.



This paper examines Costco's hybrid market entry strategies to China within the framework of multidimensional embeddedness. Different from its standardized operation in all the other international markets, Costco entered the Chinese market first through an online store on Alibaba's Tmall Global cross-border e-commerce platform in 2014. After opening another flagship store on Tmall's domestic marketplace in 2017, Costco opened its first warehouse club in Shanghai in August 2019. The debut of Costco's first outlet in China was a huge success. Based on an in-depth interview with a representative of Costco China and secondary company documentation, this study investigates how hybrid market entry strategies enabled Costco to achieve societal, network and territorial embeddedness in the Chinese market. Through this case study of Costco in China, this paper also adds insight into how international retailers strike the balance between standardization and localization in retail internationalization.

Paper 2: International Expansion and Strategies of Discount Grocery Retailers Revised

Sina Hardaker, Julius-Maximilians-University Warzburg

Grocery discounters are among the most successful retailers to internationalize. Colla in 2003 demonstrated the underlying causes that have determined the success or failure of the discount retailers internationally, revealing different strategic groups and internationalisation strategies. So far it has been argued that food discounters are prepared to accept a lower expansion speed in order to reduce risk and cost as much as possible. In addition, countries were selected which already reveal a certain market maturity. The purpose of this article is to revise the international expansion strategies of discount grocery retailers. While factors such as competitive advantages have not changed significantly, the paper argues for several factors, such as digitalization, that lead to the shift of key success factors as well as the geographical scope of internationalization. As one example serves German Aldi Süd's market entry into China. So far, the German discounters have relied heavily on their standardized concept of the domestic market and are pursuing a global internationalization strategy, with the rapid establishment of a (stationary) branch and distribution network. Yet, in China, the grocery discounter is reinventing itself, totally abolishing the discount format.

Paper 3: Locational Analysis of Shopping Centers in Kaduna North LGA, Kaduna State, Nigeria

Y. Saleh, Department of Geography, Kaduna State University, Kaduna

This paper carried out the locational analysis of shopping centers in Kaduna North Local Government Area of Kaduna State, Nigeria. Garmin Handheld GPS was used to obtain the coordinates of all the shopping centers in the study area. Average Nearest Neighbour was calculated using ArcGIS 10.4. The expected distance is 433.9973 meters, while the observed distance is 347.1671 meters with a z-score of -2.198730. The result shows that the pattern of distribution of shopping centers in Kaduna North is clustered. The study therefore recommends further research to ascertain the factors influencing the siting of shopping centers in Kaduna North Local Government Area of Kaduna State.

Track: Education

When: Tuesday, October 20 at 1pm EST

PAPER SESSION: Experiential Learning

Session Chair: Dawna Cerney (dlcerney@ysu.edu)

Session Description: Student engagement is important in learning geography. Field experiences in particular offer concrete ways for the student to understand the disciplines content and how professional geographers, collect, manipulate and display data. Development of technology such as a Survey APP and Virtual Reality can further help stimulate student interest and understanding in geography, as well as develop skill sets. This session explores the use development of a Survey123 to demonstrate mapping and a Virtual Reality learning platform to engage in field exercises when students cannot engage in field exercises, such as under the conditions of COVID.



Scott Miller, New Mexico State University

Engaging students in experiential learning by designing field activities on campus can demonstrate how geographers collect, manipulate, and display data. This undergraduate module provides an example of the scientific method and potentially recruits curious geographers into the major. We developed a Survey123 app to demonstrate mapping activities to students in an on-line freshman-level course. The activity coincided with a chapter on biodiversity which described photosynthesis, and the importance of trees in carbon sequestration. Students mapped locations of common tree species on campus. Students not on campus were guided to use the app to zoom in to campus and mark features on the associated satellite image. We downloaded their data into spreadsheets and designed an Excel activity to demonstrate data organization and summary. Next, we mapped the survey results on Google Earth. The objective of our effort was to design activities that make the link between apps, maps, features of the environment, and geographic concepts obvious; thus, prompting the realization that we all use geography in our everyday lives. Developing an assessment tool and structured discussions for this activity will likely improve the learning, and possibly the recruiting and retention of freshman students in geography.

Paper 2: GeoEPIC: Launching virtual field geography experiences in the time of COVID

Dianna Gielstra, Prescott College

Dawna Cerney, Youngstown State University

Lynn Moorman, Mount Royal University

Niccole Cerveney, Mesa Community College

With the present COVID-19 circumstances, opportunities afforded students for field experiences in the K-16 classroom are interrupted. Moreover, on-line opportunities for field geography opportunities may be cost-prohibitive for school programs facing tight budgets and challenging transitions from face-to-face to remote learning. Our team designed GeoEPIC, a learning platform to house field geography lessons using virtual reality, to simulate a classic field geography experience. We offer a sample lesson for AP Human Geography and Comparative Government and Politics that uses GIS tools, remote sensing, 'field measurements', gamified content and virtual reality to allow teachers and students to partake in multi-dimensional, novel landscape, field opportunities. Inquiry-based learning paired with field geography are valuable teaching tools that allow students an intrinsic understanding of 'place' via engagement in direct, authentic experiences in the environment. Fieldwork is active learning, developing skills beyond course curriculum, and acquainting the student with data collection, tool and device use, map reading analysis, interpretation and analysis, while interacting with others for a deeper, socio-emotional learning experience. GeoEPIC, as a repository for field lessons, has the potential to increase availability of supplemental education opportunities lost because of the pandemic.

Track: Student Papers

When: Tuesday, October 20 at 1pm EST

PAPER SESSION: Student Paper Presentations

Session Chairs: Clayton Whitesides (cwhitesid@coastal.edu) and Brandon Vogt (bvogt@uccs.edu)

Session Description: Student Paper Presentations

Paper 1: Examining Food Insecurity in the Arctic Region: Case Study of Arviat, Lessons to be Learned from Building Greenhouses in the Far North

Julie Robertson, Ryerson University

Brian Ceh, Ryerson University

Food insecurity is impacting a greater share of populations worldwide. This is as true in highly developed regions as it is in remote regions. In the Arctic region those residents impacted by this health risk range from 46% to 70% depending on the region and the community. This research will measure the impact of two 42-foot geodesic dome greenhouses on the most vulnerable members of Arviat, Nunavut, the second largest community in the region. The preliminary research survey completed on June 2019 prior to the first



secure status of the participants after they have benefited from two years growing seasons of fresh local produce.

Paper 2: Circular Economy in local food systems: a framework for future investigation

Shriya Rangarajan, Cornell University

The Circular Economy (CE) is paradigm that seeks to promote environmentally-sound economic practices by closing the loop on material cycles in product value chains. Through reducing, reusing, and recycling, and linking of disparate industries, closed loop production cycles achieve lower carbon footprints and better economic outcomes by reducing virgin material consumption, emissions associated with transport and production, and stimulating labor markets by replacing manpower for machinery. CE is an inherently spatial concept since cooperative structures, industrial symbiosis, recycling of byproducts, and transport of products, are all functions of proximity. Food as an essential human need is a major polluter and therefore a CE focus area. Local food systems, especially those composed of clusters of small-scale producers, direct marketing channels to local consumers, and cooperative producer organizations, supported by local policy, form the ideal base for application of a CE. Despite much potential, geographical research on CE lags efforts from within industry and the nonprofit sector. Utilizing concepts from CE, industrial ecology, and supply chain literature on the one hand, and social and community capital theory on the other, this paper develops a theoretical framework for application of CE in local food systems and explores agendas and directions for future research.

Track: Miscellaneous

When: Tuesday, October 20 at 1pm EST

PAPER SESSION: [Information Coming Soon]

Session Chair: Jay Newberry (jnewber@binghamton.edu)

Session Description: [Information Coming Soon]

Paper 1: Not Your Grandmother's GIS

Kevin A. Butler, Product Engineer – Sciences, ESRI

Almost from its inception as a sub-discipline of geography, GIS has been criticized for its naïve empiricism, zealous adherence to positivist tenets, and temporal myopia (Leszczynski, 2008). While some of this criticism is well deserved, some of it is based on a stale view of the techniques and approaches available in modern GIS software. Through a series of analysis vignettes, this presentation will explore new(er) spatial analytical tools and workflows that can help GIS-based research and practice be more equitable, robust, realistic, and reproducible. The analysis vignettes will explore ways to identify and mitigate racial and ethnic bias in spatial data, incorporate spatial and attribute uncertainty in analysis workflows, move beyond simplistic linear relationships in analytical models, and demonstrate practical ways to meet the ethical requirement of making GIS-based research and practice replicable and reproducible.

Track: Business

When: Tuesday, October 20 at 1pm EST

ROUND TABLE: Defining A Core Set of GIS Methodologies for Business Study and Application

Session Chair: Murray Rice (murray.rice@unt.edu)



whether the foundational methods and application areas are well-chosen. This session is an opportunity for business geography community members to examine the foundations of the field and provide some baseline level of what might be considered standard practice in terms of GIS application.

Participants:

- Brett Lucas, City of Cheney
- Gary Gruccio, Signet Jewelers
- Evan Cleave, Ryerson University
- Joseph Aversa, Ryerson University

Track: Business

When: Tuesday, October 20 at 2pm EST

PAPER SESSION: COVID-19 and Business Geography

Session Chair: Tom Dwyer (tom.dwyer@bankofhope.com)

Session Description: This session themed “COVID-19 and Business Geography” consists of two papers that look at the business reactions to the coronavirus pandemic. In the first paper, the presenter(s) study the state of the health of US lodging corporations pre-pandemic and then how these corporations managed their outstanding loans to stay in business. In the second paper, the presenter(s) examine how quick service restaurants and casual dining restaurants have had to adapt to social-distancing requirements and how this is leading to a right-sizing opportunity.

Paper 1: Handling \$1.75 Billion in Hotel Loans During a Pandemic: Lessons Learned

Tom Dwyer

Toward the end of the first quarter of 2020, the COVID-19 pandemic began to severely impact the US lodging industry. This session begins with a review of how pandemic-related events played out, and what the perceived health of the US lodging industry was just before the pandemic-related impacts manifested. With that foundation established, the focus then shifts to how the problems of hotel/motel operators became a critical challenge for a nationwide bank with approximately \$1.75 billion in outstanding loans to those hotel/motel operators. Strategies employed by the bank to mitigate potential losses on those loans will be discussed, including specific actual examples of loan issue mitigations. There will be significant focus on one particular strategy that involves the use of a particular data vendor’s hotel performance data, including specific insights gained from those data related to attributes like chain scale segmentation and seasonality in the local geographic market. The lessons learned should provide valuable insights for appropriate responses to future industry challenges.

Paper 2: Insights on the Right-Sizing of Restaurant Formats in a Post-Pandemic World

Steve Kerhart, Continental Realty Advisors

COVID-19 has laid bare the fragility of the economy, and reoriented consumers attitudes between necessities and desired goods and services. Among the fallout from this recent economic shift, the retail sector has been the most impacted of commercial property classes nationwide. Restaurant sales have experienced declines overall, but the Fast Food / QSR sector has seen limited impact (or even, in some cases, positive growth) while casual dining has seen the greatest decline in revenues. This is, in part, due to the implementation of social distancing practices and the implication of decreasing space utilization (fewer seats). With insights from GIS databases as well as publicly provided sales data from restaurant chains (10Ks/Investor Relation Data), this session will evaluate and measure the differences between QSRs (in particular drive-through chains) and casual dining (indoor dining, typically with beer and liquor licenses) to determine both historic and prospective risks and opportunities for the two property types. Special focus will be given to the physical attributes (building size, site area, and location) to develop a “right-size” model by property type. Concepts covered include highest-and-best use, variations of property rights, lease types,



Track: Education

When: Tuesday, October 20 at 2pm EST

PAPER SESSION: Geographic Education, K-12, Higher Education

Session Chair: Dennis Edgell (dennis.edgell@uncp.edu)

Session Description: This session will explore issues and techniques utilized in Geographic Education. This includes enhancement of liberal arts courses and problems and prospects for general education. Topics also include instructional experiences teaching applied geo-spatial technologies, and the mentoring of student research.

Paper 1: A Fair Candlemas: The Use of Folklore for Teaching Upper Air Meteorology and Climatology.
Dennis Edgell, University of North Carolina at Pembroke

This paper is the second in my geographic education series "Meteorology and Myth". The purpose was to develop teaching modules which bridge topics in geography and atmospheric science with topics in history, art, folklore and culture. One question that students in my introductory "Weather and Climate" class would inevitably ask was if the "Groundhog Day" predictions are true. Although a groundhog and its shadow cannot predict the weather several weeks in advance, I found that there was a holistic teaching opportunity within the folklore. The legend does not make short-term meteorological sense. However, there may be long-term upper atmosphere circulation patterns, which have allowed the folk myth to arise in Europe, then survive in America. The lesson was not designed to "prove" if the Groundhog Day folk predictions are true. The point was to explain the relevant physical and cultural geographies in an interesting and accessible manner. Vivid and evocative imagery were used to make the atmospheric concepts engaging and memorable for general education students. Student outcomes include the skills to describe synoptic weather patterns, use climatic charts and explain climate change. A secondary pedagogical outcome was to develop student appreciation of cultural geography, folklore and religion.

Paper 2: A Report on a Roundtable Discussion of the Future of Geography Education
Richard G. Boehm, Texas State University

The geography education community in the U.S. is small and acutely aware of the challenges it faces. Moving forward, its members must work collaboratively and build capacity to provide high quality geography instruction in schools. Judicious decision-making matters now more than ever. Alarms were sounded by a series of events taking place across the last three years (2017-2019). Initially, these threats to the field's well-being and status might not have been perceived as ominous; but when compounded over time, their potential negative influence cannot be ignored. Because of these warning signs, the Grosvenor Center for Geographic Education prepared a Roundtable discussion regarding the future of geography education with geography educators across the nation. This report reviews the results of that discussion and suggestions for moving forward.

Track: Student Papers

When: Tuesday, October 20 at 2pm EST

PAPER SESSION: Student Paper Presentations

Session Chairs: Clayton Whitesides (cwhitesid@coastal.edu) and Brandon Vogt (bvogt@uccs.edu)

Session Description: Student Paper Presentations



Exposure to Arsenic (As) is known to be associated with several adverse health outcomes including skin and internal cancers. Geological processes and anthropogenic activities are known to influence As concentrations in groundwater and can lead to geographical differences in risk of exposure. In Texas, groundwater is the major source of water consumption and contains high As concentrations. While previous research has identified spatial and temporal trends in As concentrations in Texas, their focus is limited to relatively small geographic regions and/or short time periods. This paper uses a geostatistical model and well data from the Texas Water Development Board's groundwater quality database to identify areas with historically elevated values of As in groundwater as well as those areas showing a persistent increase. The first map identifies those areas that are consistently in the top one-third of As concentration between 1990 to 2019. The second map identifies those areas that show persistent increases in As concentrations over 5-year increments for the same time period. The results show several areas of concern especially in the Panhandle and Gulf Coast regions, where As concentrations exceed the 10 ug/L levels that studies show may contribute to an elevated risk of several diseases. Developing maps of existing and emerging risk of exposure will help guide health care intervention efforts for diseases that are commonly associated with As.

Paper 2: Nashville through the eyes of youth: Using participatory mapping as a tool for spatial justice

Kathryn Morgan, Vanderbilt University

Kayla Anderson, Vanderbilt University

As cities grow and change rapidly, young people's participation in local decision-making is crucial for achieving more equitable urban spaces. Youth-led participatory mapping is an applied research modality through which young people record and represent the spatial knowledge of their communities and leverage mapping as a tool to drive policy change. This presentation traces the formation, goals, and target outcomes of the Nashville Youth Design Team (NYDT), a youth-led participatory mapping collective formed through a community-university collaboration and funded by the National Institute of Justice. NYDT is charged with creating a comprehensive spatial dataset that will allow for a deeper understanding of youth experience in Nashville. NYDT members lead mapping processes aimed at identifying the issues most pressing to young people in their communities and addressing these local issues through urban design. Through mapping, they seek to spatially represent the current state of youth wellness in Nashville by combining information from schools, community institutions, and young people themselves. This session outlines the training process used to prepare NYDT members to engage others in a participatory mapping process and the team's plans for leveraging participatory mapping to decrease disparity in the city's urban policies, systems, and environments.

Track: Careers

When: Tuesday, October 20 at 2pm EST

WORKSHOP: The Successful Virtual Interview

Session Chair: Denise Blanchard (rb06@txstate.edu)

Session Description: Covid-19 has ushered in an era of "new normals." For geographers entering the job market, or making a career change, interviewing is likely to be conducted virtually at some level. This workshop will offer insight, advice, tips, and a checklist to help you prepare for the day before, the day of, and during your virtual interview to ensure a successful online encounter.

Track: Careers

When: Tuesday, October 20 at 3pm EST

PANEL: Challenges in an Evolving Academic Job Market for Geographers



given daunting challenges faced by universities' long-established business models, uncharted waters in dealing with Covid-19, and myriad other economic, demographic, and social shifts. This panel will address key issues affecting career opportunities for academic geographers and strategies for improving preparation for employment as educators and scholars, with an emphasis on these changing times. The panelists in this session are early-, mid-, and late career geographers as well as aspiring academics with a wide range of experiences and perspectives.

Panelists:

- Dennis Edgell, University of North Carolina-Pembroke
- Michael Solem, Texas State University
- Dawna Cerney, Youngstown State University
- Thomas Larsen, University of Northern Iowa
- Brandon Vogt, University of Colorado-Colorado Springs

Track: Business

When: Tuesday, October 20 at 3pm EST

PAPER SESSION: Retail Geography: Education and Critical Thought

Session Chair: Tom Dwyer (tom.dwyer@bankofhope.com)

Session Description: Retail geography is a popular subject in North American and European universities, as it frequently leads to rewarding professional jobs in retail corporations, financial institutions, and commercial real estate companies. Yet, there are only a few textbooks available for adoption, and the current textbooks are all in need of update to reflect the changes in the retail industry and the recent development in geo-technologies. The alternative textbook is developed with three distinctive features. First, the book is guided by both the traditional location theories and the theory of the New Geography of Retailing. Second, the component chapters are conceptualized and organized using the retail planning process as the framework. Third, the methodological chapters are presented with detailed descriptions of the techniques and are supported with practical examples to reflect the latest software development (including the Huff Model and Location-Allocation modelling). The book is written primarily for students interested in specializing in retail geography, but the majority of the chapters are useful for students of retail management and commercial real estate management, who take retail geography as a professionally-related course. As well, the application of the GIS-based techniques and the practical examples should make it a valuable handbook for practitioners in the field. Despite the trend of online retailing taking increasing market shares, bricks-and-mortar stores will continue to stay; even online retailers (including Amazon) are moving towards multi-channel retailing by building physical stores of their own. Therefore, store location analysis is still needed, and such a book still relevant.

Paper 1: An Alternative Textbook of Retail Geography

Shuguang Wang, Ryerson University

Paul Du, Allstate Insurance Co of Canada

Retail geography is a popular subject in North American and European universities, as it frequently leads to rewarding professional jobs in retail corporations, financial institutions, and commercial real estate companies. Yet, there are only a few textbooks available for adoption, and the current textbooks are all in need of update to reflect the changes in the retail industry and the recent development in geo-technologies. The alternative textbook is developed with three distinctive features. First, the book is guided by both the traditional location theories and the theory of the New Geography of Retailing. Second, the component chapters are conceptualized and organized using the retail planning process as the framework. Third, the methodological chapters are presented with detailed descriptions of the techniques and are supported with practical examples to reflect the latest software development (including the Huff Model and Location-Allocation modelling). The book is written primarily for students interested in specializing in retail geography, but the majority of the chapters are useful for students of retail management and



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Paper 2: Can Applied Geography be Critical?: A Case Study of the Target Corporation

Jack Swab, University of Kentucky

The Minneapolis-based Target Corporation is one of America's most beloved and progressive retailers. At the same time, it is also a retail behemoth competing in an increasingly aggressive and cut-throat business environment. In this presentation I outline aspects of Target's corporate strategy over the past decade, showing how a commitment to social justice was combined with an urban spatial strategy to remain profitable. By placing this strategy in the context of the Black Lives Matter protests of Summer 2020, I illuminate the limitations of this strategy, discussing how urban Targets' came to represent peak gentrification, tying whiteness, retailing, and urban space together. In the process I explore how applied geographers can reconcile some of the differences and mitigate issues between critical and applied geographical work.

Track: Education

When: Tuesday, October 20 at 3pm EST

WORKSHOP: Connecting for Community: Studying Community Issues through Connecting the GIS Platform

Session Chair: Joseph J. Kerski, PhD GISP, Esri (jkerski@esri.com)

Session Description: Individual web GIS applications have existed for over a decade, but the rapid evolution of cloud-based GIS offers instructors the ability to connect these applications that powerfully enhance teaching and research. Through connecting such tools as Survey123, ArcGIS Online, spatial analysis, story maps, and dashboards, instructors and students can gather field data, map, analyze, communicate, crowdsource, and create real-time views of the data as it is being gathered. Connecting these tools in a platform can enhance inquiry, foster critical thinking, enhance spatial analysis skills, encourage collaboration, and encourage communication. Moreover, they can serve as a medium and catalyst to encourage the community to take action about a relevant and timely issue of concern to community members. Join Joseph Kerski as he illustrates how these tools can be used in a variety of studies of local to global issues, and in a wide array of online and face-to-face courses. Emphasis will be placed on how you can use these tools in your own work.

Track: Health

When: Tuesday, October 20 at 3pm EST

PAPER SESSION: Health Geography, Session 2: Sponsored by Maptitude

Session Chair: Jon Comer (jon.comer@okstate.edu)

Session Description: In this session themed health, two papers are presented. In the first paper, the presenter(s) investigate the relationship between environmental characteristics and obesity. In the second paper, the presenter(s) argue that the differential effects of air pollution on vulnerable populations is understudied and that the current pollution sensor network in the Dallas-Ft. Worth metroplex is unable to capture environmental pollutant's threat to a fragile community's public health.



Obesity continues to be an on-going health problem in the U.S. Health geographers have pursued much research on this topic, but more often the focus is on socio-economic and racial/ethnic factors, the built environment (e.g., walkability), or the availability of fresh foods (e.g. food deserts). This research controls for these factors in an attempt to uncover the extent to which climate, population density (as a proxy for rurality), and other environmental factors correlate with obesity at the county level. Understanding what environmental traits seem to lead to higher or lower obesity levels can provide health departments and other involved agencies with insight into how positive traits (those that correlate with lower obesity) can be enhanced or recreated as well as how negative traits can be reduced or mitigated to encourage healthier nutrition and exercise habits of residents in higher obesity areas.

Paper 2: Building sustainability through community-based ecotourism: a framework for the Chorokhi Delta
Sujayita Bhattacharjee, University of Mumbai

The Chorokhi Delta, located in the south Caucasian country of Georgia, is an ecological paradise of remarkable natural beauty. It is rich in biological diversity as well as attracts a large variety of migratory birds. However, as a result of the growing human intervention, the natural environment of the Chorokhi Delta is gradually degrading. The existing socio-economic condition in the areas surrounding the delta also has been proving to be detrimental in this regard. As a result, the delta is struggling amidst unsustainable conditions. Hence, there is a need to plan and develop such strategies that will enable re-establishing its sustainability. Based on the existing scenario, conserving the environment of the delta along with promoting socio-economic development in the areas along it can prove to be beneficial in this regard. Since the area offers a huge ecotourism potential, developing strong community-based ecotourism can enable achieving this goal. Therefore, in this study, a framework for developing community-based ecotourism as a suitable strategy for building sustainability in the Chorokhi Delta is presented.

Track: Modeling

When: Tuesday, October 20 at 4pm EST

PAPER SESSION: Modeling water and society

Session Chair: Chetan Tiwari (chetan.tiwari@unt.edu)

Session Description: Water is critical and clear and accurate communicating the condition of water is critical for decision making and policy. These two papers investigate the importance of that communication. The use of a web map and digital dashboards allows raw data to be shared to the public and stakeholders. A comprehensive national geospatial data base of publicly available drinking water in 23 states. The procedures of standardization and output of these data sets are discussed in the creation of a standardized national database.

Paper 1: Well, that's water: Interactive visualization of groundwater data

Jesse Rouse, UNC Pembroke

Madan Maharjan, UNC Pembroke

Groundwater data is a key metric for understanding changes in local aquifers in response to external stresses such as precipitation, drought, and human activities. These responses could have significant impacts on the economy and environment overtime. The Department of Geology & Geography at UNC Pembroke has been conducting groundwater monitoring in Robeson County, NC since the winter of 2017. This data includes continuous water-level measurements from thirteen wells across the county monitored by students involved in the project and water-level measurements at fourteen wells on the UNCP campus. While the project has previously made these data available via a webmap, the growth of digital dashboards has provided a new way to share not only the raw data, but to share the data through interactive graphs and charts in addition to a webmap interface. This paper will discuss the planning and initial implementation of a dashboard for this on-going project which can inform direct stakeholders and the general public using more immersive tools.



Kayla Anderson, Vanderbilt University

Due to data limitations, US drinking water analysis is often conducted at the county-level. The lack of readily accessible community water system (CWS) estimated service area boundary (ESAB) data has limited community-level water justice analysis around drinking water quality and affordability from being more accurately measured; thereby limiting evidence to support policy recommendations. By using county-level analysis, nuances caused by social, political, economic, and geological differences are masked. To address this limitation, the Drinking Water Justice Lab at Vanderbilt University has created the most comprehensive national geospatial database of CWS ESABs in the US. The database consists of 23 states' geospatial data of ESABs; this number represents the publicly available datasets. This presentation will focus on the procedures implemented to create a standardized process and output across these data. Several challenges emerged, such as the inconsistency and incompatibility of state data and the time and effort needed to mitigate these discrepancies to create a standardized national database. We discuss the need for the accurate scale of analysis within drinking water research, the challenges around creating a national database of CWS ESABs, recommendations to improve the database construction and quality, and the potential impact to address drinking water injustice.

Track: Hazards

When: Tuesday, October 20 at 4pm EST

PAPER SESSION: Flood Risks and Hazards 1

Session Chair: Jon Comer (jon.comer@okstate.edu)

Session Description: In this session themed flood risks and hazards, two papers are presented concerning these environmental risks. In the first paper, the presenter(s) determine that the main risks in northwest Albania and the whole country are earthquakes and floods. In the second paper, the presenter(s) propose a framework utilizing spatiotemporal analysis for flood risk assessments at a continental scale.

Paper 1: Environmental hazards In Albania: case study - Shkoder Region

Dritan Rustja, University of Shkoder "Luigj Gurakuqi"

This paper takes into consideration the occurrence of environmental hazards in Albania, analyzing their patterns of development for this country in general and for Shkoder region, which is located in its North-western part, in particular. Based on the use of the existing scientific literature, on a concrete case study and on field work, this paper analyzes in more detail the occurrence of the last earthquake that hit Albania in 2019 and the floods that occurred in Shkoder region in 2010. The paper finds out that, the most important environmental hazards faced both at the national and regional level, are earthquakes and floods; despite the fact that landslides, avalanches, wildfires, epidemic diseases and technological hazards have their relative importance, too. One of the main conclusions drawn based on these data, is that the consequences of these hazards, besides their natural character are also driven by stimulated factors of human vulnerability, such as population growth, urbanization, poverty, unsustainable development, natural resource degradation, inadequate infrastructure and weak institutional capacity. As a conclusion, this paper provides concrete recommendations on how to minimize the effects of environmental hazards in Albania and Shkodra region, by adapting and preparing to them.

Paper 2: A framework to analyze flood risk at a continental scale

Deb Smith, Penn State University

Flooding is a consistently destructive issue, and as flooding increases due to climate change, more people will be affected by it. Flood maps show where floods might happen, but typically don't show who and what is at risk. Flood risk assessments are needed that include hazard, exposure, and vulnerability data. The following is a proposal for a framework utilizing spatiotemporal analysis for flood risk assessments at a continental scale. Data used is SRTM elevation data and ECMWF runoff data, as well as various datasets showing exposure and vulnerability, including population density, poverty, and access to resources. This project utilizes spatiotemporal streamflow data to determine flood probability. By blending current



information can help leaders and organizations to make the proper preparations or do things to mitigate flood risk in the assessed areas of risk.

Track: Education

When: Monday, October 20 at 4pm EST

ROUND TABLE: Using a blended learning approach to bridge the applied and the theoretical in teaching Geography

Session Chairs: Siobhán McPhee (siobhan.mcphee@ubc.ca) and Nina Hewitt (nina.hewitt@ubc.ca)

Session Description: Applied geography represents the dialectic relationship between theory and application (Pacione 1999, 2004). A well-informed and rigorous pedagogy to teaching and learning Geography must represent this dialectical relationship (Pacione 1999). How then can the relationship between the theoretical and the applied be challenged within the 'spaces' of the university lecture room or lab? Can this happen in the increasingly online, blended approaches instructors are adopting, especially with the current requirements of COVID19 teaching situations? This roundtable session will focus on a critical discussion of approaches to delivering applied experiences for students. Examples from the organizers' experience and toolbox of blended and synchronous approaches will be presented to stimulate discussion. In particular we will explore how emerging media and online environments may challenge traditional 'spaces' of learning and contribute to more applied active learning. The contention is that adopting more blended approaches to teaching Geography will enable students to make critical connections between theory and application. The objective of the roundtable session is to bring together geographers from all backgrounds of theoretical and applied approaches to have a conversation on how best to deliver formative and rigorous geographical content to students.

Track: Modeling

When: Tuesday, October 20 at 5pm EST

PAPER SESSION: GIS: Qualitative Analysis and Visualization

Session Chair: Chetan Tiwari (chetan.tiwari@unt.edu)

Session Description: Because place is important - the inclusion of context and experience of place is intentional to its understanding. GIS has become an important agent in delivering a frame of reference. These presentations illustrate how GIS is paired with direct experiences through driving interviews and historical data to expand the understanding of place which is often lost to history or is difficult to share as it is related to knowledge and experience.

Paper 1: "Ride with me": the advantages and challenges of driving interviews

Shaolu Yu, Urban Studies, Rhodes College

This paper aims to expand qualitative GIS and mobile interviews by discussing driving interviews as a research method that integrates interviews, videos, and spatial data. By using the research project "Between White and Black: Chinese in the South" as an example, this paper discusses both the phenomenological and epistemological implications of using driving interviews in studying everyday human experiences as racialized bodies. The driving interviews engage with the multi-scalar data by simultaneously collecting maps (macro), videos (meso), and audios (micro). Similar to walking interviews, driving interviews capture both topography and biography: place contexts and individual narratives in real time with locations and paths. Driving interviews have advantages over walking interviews as they are



research but also in the applied fields such as urban planning and design.

Paper 2: Exploring Historic Landscapes in a GIS Environment - A Study of Lahore, Pakistan

Fatimah Khan, FK Consulting

This paper explores the use of GIS methods to map and visualise a city's historic landscape. Using Lahore, Pakistan, as a pilot case, the study aims to understand the challenges involved in conceptualising a city's dynamic past in a digital environment. The thesis demonstrates how GIS is applied to record and in the process represent what used to be, what was lost and what came to be over time in the context of Lahore – a city associated with different rulers. Historic maps, photographs, gazetteers, historical and literary accounts, memoirs etc., and contemporary mapping platforms constitute examples of data sources. The documentation of place-names and the extent to which they can be linked to other types of data is central to the study. With the help of examples, the paper draws attention to the constraints and choices faced in defining the study area, in representing a historic urban landscape(s) in a geodatabase and in collecting and creating meaningful data.

Track: Education

When: Tuesday, October 20 at 5pm EST

PAPER SESSION: Critical Geographies of Schools and Education

Session Chairs: Reecia Orzeck (rorzeck@ilstu.edu) and Lauren Fritzsche (fritzsche@email.arizona.edu)

Session Description: This session brings together scholars working on a range of topics within the broad umbrella of critical geographies schools and education. Critical geographies of schools and education centers struggles for justice and interrogates the manners in which overlapping systems of oppression, such as racism, sexism, and colonialism, shape education, including practices and modes of teaching and spaces of learning. Papers included in this session critically examine pedagogical practices and curriculum design at the undergraduate and graduate levels, the discursive construction of student protest, and the role of schools within cities.

Paper 1: Teaching information literacy in an undergraduate area studies class

Reecia Orzeck, Illinois State University

Scholarship on teaching and learning has made it clear that students' existing misperceptions can impede the acquisition of new knowledge, especially when these misperceptions are not isolated ideas but part of an overarching and deeply-entrenched way-of-seeing. In this presentation, I report on one attempt to facilitate students' examination of the nature and genealogy of their existing beliefs, as well as the source of many socially-dominant ideas: a two-week information literacy module included at the start of an undergraduate Geography of the Middle East course. I also report on the results of an online questionnaire designed to assess whether the module was effective. I conclude with some thoughts on how to improve the module, as well as on the future research that may guide those improvements.

Paper 2: Rude and in Defiance of Authority: Civility Discourse as Strategy to Undermine Student Concerns in Arizona Anti-Mexican American Studies Legislation

Gloria Howerton, University of Wisconsin, Eau Claire

This paper addresses how the attempted erasure of Mexican American history and culture in public K-12 classrooms in Tucson, Arizona was, and continues to be, rationalized through rhetoric concerning "rude" youth protest. Arizona Revised Statute (ARS) § 15-112 was used as justification to terminate Tucson Unified School District's Mexican American studies (MAS) program in 2010. Former state superintendent Tom Horne wrote the bill that became ARS 15-112, admitting that his goal was to first end MAS and then all ethnic studies programs in Arizona public schools. Years of protest and legal battles followed. I consider the flagging of "rudeness" in attempts to undermine student protest and avoid discussions of racism in the



the discursive political work done through relying on this version of civility discourse that particularly targets youth of color, which I refer to as “rudeness rhetoric.” Here, politicians engage in rudeness rhetoric to undermine the credibility of both those negatively impacted by the legislation and those who protest it. The use of the image of the rude or disrespectful student does the work of not only framing protest as “uncivil” but diminishing youth protesters and their agency. Doing so allows politicians to lay the blame for “rude behavior” at the feet of the MAS program, and moves the discussion away from racism in the legislation toward whether the program trained “future” citizen subjects in the appropriate forms of civil discourse and debate.

Track: Hazards**When: Tuesday, October 20 at 5pm EST**

PAPER SESSION: Flood Risks and Hazards 2

Session Chair: Jon Comer (jon.comer@okstate.edu)

Session Description: In this session themed flood risks and hazards, two papers are presented concerning these environmental risks. In the first paper, the presenter(s) provide an in-depth examination of the neighborhood effect averaging problem (NEAP) and how the NEAP is associated with people’s daily exposures to ground-level ozone in Los Angeles. In the second paper, the presenter(s) illustrate a case study on the economic impacts of transport infrastructure disruptions caused by the hypothetical Istanbul earthquakes in Turkey.

Paper 1: How Neighborhood Effect Averaging Might Affect Assessment of Individual Exposures to Air Pollution: A Study of Ozone Exposures in Los Angeles

Junghwan Kim, University of Illinois at Urbana-Champaign

Mei-Po Kwan, Department of Geography and Resource Management, and Institute of Space and Earth Information Science, The Chinese University of Hong Kong

The neighborhood effect averaging problem (NEAP) can be a serious methodological problem that leads to erroneous assessments when studying mobility-dependent exposures (e.g., air/noise pollution) because people's daily mobility could amplify or attenuate the exposures they experienced in their residential neighborhoods. Specifically, the NEAP suggests that individuals' mobility-based exposures tend toward the mean level of the participants or population of a study area when compared to their residence-based exposures. This research provides an in-depth examination of the NEAP and how the NEAP is associated with people's daily mobility through an assessment of individual exposures to ground-level ozone using the activity-travel diary data of 2,737 individuals collected in Los Angeles. The results obtained with exploratory analysis and spatial regression models indicate that the NEAP exists when assessing individual exposures to ozone in the study area. Further, high-income, employed, younger, and male participants (when compared to low-income, nonworking, older, and female participants) are associated with higher levels of neighborhood effect averaging because of their higher levels of daily mobility. Finally, three-dimensional geovisualizations of the space-time paths and hourly ozone exposures of seventy-one selected participants who live in the same neighborhood corroborate the findings obtained from the spatial regression analysis.