

**Middle States Division  
American Association of  
Geographers**

**Annual Meeting**

**October 16-17, 2020**

**Virtual Host: Hofstra University**



## The Meeting at a Glance

### Friday, October 16<sup>th</sup>

1:00 PM – 1:15 PM	Opening Remarks and Virtual Conference Overview: <b>Welcome</b> from Dr. Benjamin Rifkin, Dean, Hofstra College of Liberal Arts and Sciences <b>Overview</b> from Dr. Jase Bernhardt, Department of Geology, Environment and Sustainability, Hofstra University, 2020 Middle States AAG President
1:20 PM – 2:20 PM	<b>Paper Session #1:</b> Climatology and <b>Paper Session #2:</b> Emerging Topics in Critical Geography
2:30 PM – 3:30 PM	<b>COVID-19 on Long Island Panel</b>
3:35 PM – 3:55 PM	Facilitated Networking
4:00 – 5:00 PM	<b>Plenary Speaker: Dr. Elisabeth Root, COVID-19 Health Geographies</b>
5:10 – 6:10 PM	<b>Paper Session #3:</b> Agriculture and Ecology and <b>Paper Session #4:</b> Cultural Geography
6:20 – 7:00 PM	Geography Bowl

### Saturday, October 17<sup>th</sup>

8:15 AM – 8:30 AM	Welcome Back and Remarks
8:30 AM – 9:30 AM	<b>Paper Session #5:</b> Physical Geography and <b>Paper Session #6:</b> Remote Sensing/GIS
9:40 AM – 10:30 AM	<b>AAG Workshop:</b> Getting the Word Out about Geography: how to extend your work beyond the academy
10:40 AM – 11:40 AM	<b>Plenary Speaker: Dr. David Kaplan, Can the Field of Geography Survive? How Will it Need to Adapt?</b>
11:50 AM – 12:50 PM	<b>Poster Session</b>
1:00 PM	Closing Remarks

## **SCHEDULE OF PRESENTATIONS**

*Friday, October 16<sup>th</sup> 1:20 – 2:20 PM*

### **PAPER SESSION #1: Climatology (Chair: Michael Davis)**

- 1:20 – 1:35 PM** Anna Grayek and Michael Davis, Kutztown University: *The Seasonal Climatology of Wind in the Great Lakes Region of the United States*
- 1:35 – 1:50 PM** Madison Clark and Michael Davis, Kutztown University: *Climate Change as a Perspective: Looking Through the Lens of High School Teachers within Berks County, PA*
- 1:50 – 2:05 PM** Shenika McFarlane-Morris, Church Teacher's College and Megan Heckert, West Chester University of Pennsylvania: *Climate Change and Precarious Livelihoods among Women in Coastal Jamaica*
- 2:05 – 2:20 PM** Logan Gerber-Chavez, University of Delaware and Alina Pavalea, Babeş-Bolyai University: *Compound risk and Natech disaster management in Romania*

### **PAPER SESSION #2: Emerging Topics in Critical Geography (Chair: Stephen Sullivan)**

- 1:20 – 1:35 PM** Mark Blumler, Binghamton University: *The Coronavirus Pandemic in Evolutionary Perspective*
- 1:35 – 2:05 PM** Ibipo Johnston-Anumonwo, SUNY Cortland: *Race and Place: Persistent Patterns and Pervasive Trends in Everyday Racism*
- 1:50 – 2:05 PM** Claire Jantz, Shippensburg University: *An assessment of housing affordability in Cumberland County, Pennsylvania*
- 2:05 – 2:20 PM** Benjamin Weigner, UCLA: *COVID-19 and the climate crisis in Israel/Palestine: Converging geographies of exception*

*Friday, October 16<sup>th</sup> 2:30 – 3:30 PM*

**PANEL SESSION: COVID-19 ON LONG ISLAND**

*This panel will contextualize the geography of Long Island and the local geographic distribution of the pandemic's impact and also address the underlying social and spatial causes of the disparities in COVID-19 cases and deaths across Long Island.*

Panel Moderator: **Dr. Kari Jensen**, Professor of Global Studies and Geography, Hofstra University.

Panelists

**Dr. Craig Dalton** is an Assistant Professor in the department of Global Studies and Geography at Hofstra University. He specializes in the use of GIS for empowerment and social justice mapping. In this panel he will briefly contextualize the geography of Long Island and the local geographic distribution of the pandemic's impact.

**Dr. Martine Hackett** is an Associate professor of Health Professions in the master of public health and community health programs at Hofstra University. Her research interests include maternal-child health, infant mortality and community based participatory research. She will address the underlying social and spatial causes of the disparities in COVID-19 cases and deaths across Long Island.

**Dr. Elisabeth Root** is a professor in the Department of Geography at The Ohio State University where her work focuses on the intersection of geography and public health. At this conference she is giving a keynote talk on the geographic patterns of unequal COVID-19 impacts across diverse areas, including New York City and Long Island, and she has graciously agreed to also contribute her knowledge to this panel.

*Friday, October 16<sup>th</sup> 3:35 – 3:55 PM*

**FACILITATED NETWORK SESSION:** Details TBA. Join one of the following:

- 1) Subfield networking
  - a. GIS/Remote Sensing
  - b. Cultural Geography
  - c. Physical Geography

*Friday, October 16<sup>th</sup> 4:00 – 5:00 PM*

**PLENARY SPEAKER: Dr. Elisabeth Root, COVID-19 Health Geographies**

Friday, October 16<sup>th</sup> 5:10 – 6:10 PM

**PAPER SESSION #3: Agriculture and Ecology (Chair: Nate Gabriel)**

- 5:10 – 5:25 PM** Sheoveney O’Bryan, Church Teacher’s College: *The Challenges of Farming in Manchester, Jamaica*
- 5:25 – 5:40 PM** Meghann Smith, Pankaj Lala, Sydney Oluoch, Neeraj Vedwan, Andrew Smith, Montclair State University: *Hard Apple Cider Consumer Valuation of Sustainable Attributes: a case study of the US Mid-Atlantic States*
- 5:40 – 5:55 PM** Dillon Kadish, Manhattan College: *Food, Sustainability and FRESH in NYC*
- 5:55 – 6:10 PM** Sydney Oluoch, Montclair State University: *Public preferences for Longleaf pine restoration programs in the South Eastern United States*

**PAPER SESSION #4: Cultural Geography (Chair: Michael Davis)**

- 5:10 – 5:25 PM** Michael Davis, Kutztown University: *An Overview of Environmental Themes in the Video Game Industry*
- 5:25 – 5:40 PM** Hanbyeol Jang, Temple University: *Japan’s Colonial Commodification of Nature: Whaling in Colonized Korea*
- 5:40 – 5:55 PM** Stephen Sullivan, Sacred Heart Academy, Hempstead, NY, and Columbia University and Christine Sullivan Pulgrano, East Williston School District: *Using Children’s Literature as a Tool to Teach Geography*
- 5:55 – 6:10 PM** Stephen Tulowiecki, SUNY Geneseo: *Constructing a spatial database of historical accounts of past Native American fire use*

Friday, October 16<sup>th</sup> 6:20 – 7:00 PM

**GEOGRAPHY BOWL:** Details TBA.

Saturday, October 17<sup>th</sup> 8:30 – 9:30 AM

**PAPER SESSION #5: Physical Geography (Chair: Nate Gabriel)**

- 8:30 – 8:45 AM** Paul Marr, Shippensburg University, Robert Bodnar, Steve Nissly, John Wah, Scott Drzyzga: *The Iron Springs Site (36AD0576): A Prehistoric Example of Rhyolite Quarrying Techniques*
- 8:45 – 9:00 AM** Tao Tang, SUNY College at Buffalo: *UAV-based high spatial and temporal resolution monitoring of surface moisture status in a vineyard*

- 9:00 – 9:15 AM** Falon Treis and Zsuzsanna Balogh-Brunstad, Hartwick College: *Sediment and Nutrient Load of the Charlotte Creek Watershed in New York State*
- 9:15 – 9:30 AM** Taylor Wieczerek, Montclair State University: *Public Perception and Willingness to Pay for Green Infrastructure and Improvements in Northern New Jersey Using Discrete Choice Experiment*

**PAPER SESSION #6: Remote Sensing/GIS (Chair: Michael Davis)**

- 8:30 – 8:45 AM** Julaiti Nilupaer, Penn State: *Utilization of Crowdsourcing and Volunteered Geographic Information in International Disaster Management*
- 8:45 – 9:00 AM** Junghwan Kim, University Illinois at Urbana-Champaign, Mei-Po Kwan, The Chinese University of Hong Kong: *How Neighborhood Effect Averaging Might Affect Assessment of Individual Exposures to Air Pollution: A Study of Ozone Exposures in Los Angeles*
- 9:00 – 9:15 AM** Matthew Walter, University of Delaware: *Invasive Species Mapping in Estuarine Wetlands Using High-Resolution Aerial Imagery*
- 9:15 – 9:30 AM** Shengyuan Zou, SUNY Buffalo: *Detecting Individual Abandoned Houses from Google Street View: A Patch-based Deep Learning Approach*

*Saturday, October 17<sup>th</sup> 9:40 – 10:30 AM*

**AAG Workshop: Getting the Word Out about Geography: how to extend your work beyond the academy**

*Saturday, October 17<sup>th</sup> 10:40 – 11:40 AM*

**PLENARY SPEAKER: Dr. David Kaplan, Can the Field of Geography Survive? How Will it Need to Adapt?**

*Saturday, October 17<sup>th</sup> 11:50 AM – 12:50 PM*

**Poster Session**

**Anish Adhikari, Jing Gao, University of Delaware: Global gridded GDP products: A comprehensive qualitative and quantitative review of uncertainties and fitness-of-use**

**Loonibha Manandhar, Jing Gao, Fengyan Shi, University of Delaware: Quantifying the Uncertainties of Anticipated Societal impacts in modelling a 1-in-100 year Flood in Delaware**

**Angelina Kramer, Sacred Heart Academy, Hempstead, NY: Spatial Patterns in PM2.5 Air Quality on Long Island**

**Matthew Friedman, Oceanside High School, and Mia Frattura, General Douglas MacArthur High School: From Philadelphia to Portland: The American Climate in 1897**

**Mary Kenny, Montclair State University: A Spatial Analysis of Community Solar Potential in NJ**

**Caitlyn Linehan, CUNY Lehman College: Accessibility and Connectivity of Bike Paths to Select Facilities for Bronx, NY Residents**

**Olivia Teng, Herricks High School: Identifying Factors Related to Vulnerability, Preparedness, and Resiliency in Long Island and New York City**

**Gregory Pope, Montclair State University: The Use of Green Pond Conglomerate as Building Stone in Morris County, New Jersey**

**Arachna Prasad, Montclair State University: Exploring changing vegetation dynamics of Northeastern US in 2041-2070 using downscaled, bias corrected CMIP6 data**

**Ryan Harbison, Kutztown University: Precipitation Variation and The Effect on Major League Baseball Postponements: A 50-Year Study**

**Shaquille Landell, Church Teacher's College: Issues with small scale farming in Jamaica**

**Nawal Shoaib, Montclair State University: Life Cycle Analysis of a floating offshore wind farm in New Jersey**

**Macy Turner, Kutztown University: Urban Heat Island and Heat Waves**

**Vishruta Yawatkar, Elizabeth Nguyen, Matthew Walter, Kate Tully, Pinki Mondal, University of Delaware: Quantifying Land Cover Changes due to Saltwater Intrusion within the Delmarva Peninsula Using Machine learning Approaches and Remotely Sensed Imagery**

## **ABSTRACTS: PAPER PRESENTATIONS**

**Mark Blumler, SUNY Binghamton: The Coronavirus Pandemic in Evolutionary Perspective**

Evolutionary biologists agree that an important determinant of long-term species survival is genetic diversity. Humans adapt genetically, but even more so culturally; it follows that for *Homo sapiens* cultural diversity is likely the primary key to its persistence. Cultures (societies, or nations) that respond successfully to the pandemic are likely to have, or develop, advantageous cultural traits. (Albeit there also almost certainly will be a major role for circumstance, impacts from neighboring cultures, etc.) Globalization has been homogenizing culture, and the responses to the coronavirus have seen a tension between attempts to achieve a unity of response and resistance to policy consensus. I discuss some of the major areas of uncertainty from a combined genetic and cultural evolutionary perspective.

### **Madison Clark and Michael Davis, Kutztown University: Climate Change as a Perspective: Looking Through the Lens of High School Teachers within Berks County, PA**

School districts across the country have different high school science standards. Climate change, for instance, is not part of the scientific curriculum in the Commonwealth of Pennsylvania. Polarization from politics often roadblocks states from adopting modern science topics and attempts to avoid perceived controversial topics. Getting the public engaged in scientific discourse and substantively tackling climate change involves communicating effectively with others. One of the most effective ways to communicate how climate change affects our societies is through education. In this study, we will be analyzing responses from teachers in 18 different high schools in Berks County, Pennsylvania. Within these high schools, four departments (Mathematics, Social Studies, Science, and English) receive an electronic survey through QuestionPro pertaining to their backgrounds, educational philosophy, and any issues they may have with discussing climate change with their students. Through analysis, we will be able to understand which department(s) have the most freedom and comfort with discussing climate change and what potential resistance or challenges they face when broaching the subject with their students and administrators.

### **Michael Davis, Kutztown University: An Overview of Environmental Themes in the Video Game Industry**

The video games of the early 1990s have an appreciable depth of environmental tones that seem prophetic by today's standards as climate change and environmental degradation have emerged as significant topics of scientific and geographic inquiry. The political and cultural environment of the late 1980s and early 1990s played a significant role in the development of environmentally-minded video games. Since the 20th century, the depiction of these environmental themes have changed with a greater understanding of environmental science literature, have incorporated educational qualities to game play, and have migrated from large video game developers (e.g., Sega and Nintendo) to independent developers (e.g., thatgamecompany and Plethora Project). An overview of the evolution of environmental themes in video games is presented by examining individual games along with trends in the video game industry.

### **Logan Gerber-Chavez, University of Delaware and Alina Pavalea, Babeş-Bolyai University: Compound risk and Natech disaster management in Romania**

The goal of this exploratory study was to investigate how authorities from Cluj, Romania consider and prepare for compound disasters, when multiple disasters happen subsequently or simultaneously, namely for events known as Natech disasters, where a natural hazard triggers a technological hazard. The risk for such disasters is amplified by population increase in Cluj and effects of climate changes, thus specific considerations are required in order to be prepared. In order to do this we talked to representatives from different entities at multiple levels of government, who deal with risk management and planning, regarding their organizations' perception and handling of risks in the area. The topic evolved as the content of the interviews was based on the interviewee's experience and expertise. We were not able to incorporate



climate change policy implementation as a factor or method, because no one interviewed was working with any related policies. We found three main themes emerged from the interviews: (1) that the organization of government in Romania leads to fragmentation of the emergency management process and negatively impacts the ability to provide a comprehensive risk mitigation agenda; (2) that the representatives from each agency or research unit have different perceptions of the most dangerous and most important risks to be addressed and therefore are not matched on an aspect that should be complementary; and (3) there is no recognition of climate change as a real risk amplifier that will complicate current approaches to risk management.

### **Anna Grayek and Michael Davis, Kutztown University: The Seasonal Climatology of Wind in the Great Lakes Region of the United States**

Wind climatology in the Great Lakes region of the United States has accumulated a lengthy research archive. However, most of these past research endeavors have focused on mesoscale to synoptic scale features (i.e., lake effect snow during the winter season) and the production of wind energy. Seasonal variations in the wind speed have been less studied and have not encompassed the entire Great Lakes region. This paper aims to address those deficiencies and to strengthen the overall understanding of wind patterns within the Great Lakes region. By gathering wind data from Environmental Science Research Laboratory and coupling it with GFDL climate model future projections of wind and sea level pressure assuming a 1% increase in carbon dioxide, information can be obtained as to the future of wind in this economically important region. Rotational principal component analysis was conducted to assess the regionality of the wind and to establish spatial regimes regarding wind patterns. Shifting circulation patterns can affect shipping, agriculture, and energy production/consumption rates. Identification of seasonal variations and year-to-year variations can provide a more robust understanding of the climatology of the region as well as how the climate may change over time.

### **Hanbyeol Jang, Temple University: Japan's Colonial Commodification of Nature: Whaling in Colonized Korea**

Japanese colonial expansion throughout World War II left many footprints in colonized Asian countries. Although there were diverse exploitations of nature in those Japanese colonies, they have received little attention within the disciplines concerned with the exploitation of nature. In this paper, I pay attention to the exploitation of whales through commercial whaling in colonized Korea to examine how Japanese colonialism played a crucial role in changing nature-society relationships and the decimation of formerly copious whale populations, which are still influencing Korea long after its liberation from Japan. To examine the exploitation of whales in Korea under the Japanese colonialism, I deploy the theoretical approach of the commodification of nature that illustrates how commodified values of nature change societal recognitions of nature into something that can be traded and exchanged in the (capitalist) market. Through a review of pertinent archival documents, I develop the following set of interlinked arguments. (1) Japanese colonization led to the emergence of the commercial whaling in Korea. (2) Most of the whales caught and processed in colonized Korea were

transported to and consumed in mainland Japan, which contributed to Japanese expansion in Asia. (3) The experience of Japanese colonial commodification of whales fundamentally changed the whale-human relationship in South Korea, which have negatively affected the Korean whale conservation initiative since the effectuation of whaling moratorium in 1986. This article implies that tracing the colonial history enables us to unveil the commodification and colonization of whale and its various impacts on the colonized country.

### **Claire Jantz, Shippensburg University: An assessment of housing affordability in Cumberland County, Pennsylvania**

Cumberland County has been the fastest growing county in Pennsylvania since 2010. The resulting demand for housing has caused an increase in housing value, despite flat or decreasing average household income. The objectives of this study are to: 1) Document key indicators of housing affordability in Cumberland County, within the geographic context of the greater Harrisburg area (Cumberland, Dauphin, and Perry counties); and 2) identify key drivers of housing affordability. This study synthesizes data from the U.S. Census, Bureau of Labor Statistics, Center for Neighborhood Technology, and housing market reports and residential statistics from Bright MLS. Within the study region, metrics indicate that Cumberland County has the most competitive housing market: it has the highest median housing value, the lowest vacancy rate, the highest average and median sales prices, the lowest cumulative days on the market, and the lowest mean months of housing supply. From both the perspective of residents working in the county and employers based in the county, prevailing wages of many occupations do not support an affordable monthly housing allowance. Housing profiles show a housing market where single-family homes are dominant and widespread, with multi-family homes concentrated in just a few locations. Meanwhile, commuting patterns indicate high auto-dependence, resulting in cost burdens for combined housing and transportation costs. Drivers of housing affordability occur on the supply side (e.g. lack of moderately priced homes, rising costs of construction) and on the demand side (demographic trends that will keep demand high, cost barriers for home buyers).

### **Ibipo Johnston-Anumonwo, SUNY Cortland: Race and Place: Persistent Patterns and Pervasive Trends in Everyday Racism**

At the end of the last century, findings based on undercover investigative journalism in St Louis, Missouri revealed race-based prejudice and discrimination in housing, employment and other day-to-day urban activities. This presentation examines the degree to which stark anti-Black racism that existed in St Louis is evident or altered decades later in cities of New York state and in neighboring Mid-Atlantic states. Using research on differential experiences of residents in urban and suburban locations across New York, New Jersey, Pennsylvania and Connecticut, twenty first century evidence about contemporary realities of race-ethnicity and place indicates the need for continued interventions for dismantling racial bias and discrimination in order to foster social justice, equity and inclusion among the country's increasingly diverse population.

### **Dillon Kadish, Manhattan College: Food, Sustainability and FRESH in NYC**

The industrialization of society has created a shift in the way humans view themselves in the natural environment; humans now view themselves as independent from their environment rather than factors of it, further creating a disconnect in the way humans view their food. The industrial food system was designed to serve a system that feeds everyone. Quantity is not the problem; distribution is. This paper uses a series of geographic analyses to explore the existence of food deserts in New York City as they relate to the FRESH program, introduced in 2009 under Mayor Bloomberg. Specifically, analyzing whether the program has fulfilled its goal of increasing access to healthy foods. Additionally, this paper will explore outside forces like redlining, population demographics, and income levels to try and provide a holistic view of the question at hand.

### **Junghwan Kim, University Illinois at Urbana-Champaign, Mei-Po Kwan, The Chinese University of Hong Kong: How Neighborhood Effect Averaging Might Affect Assessment of Individual Exposures to Air Pollution: A Study of Ozone Exposures in Los Angeles**

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 or 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 the Los Angeles metropolitan statistical area. The results obtained with exploratory analysis (e.g., a scatterplot and histograms) 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 interactive 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.

### **Paul Marr, Shippensburg University, Robert Bodnar, Steve Nissly, John Wah, Scott Drzyzga: The Iron Springs Site (36AD0576): A Prehistoric Example of Rhyolite Quarrying Techniques**

The Iron Springs (36AD0576) archaeological site is a small rhyolite quarrying area located at the southern end of South Mountain in south-central Pennsylvania. The site consists of approximately 5 individual quarry pits at the edge of a steep slope where large float has detached from the bedrock.

Rhyolite was used by prehistoric people to create stone tools and was traded widely throughout the Mid-Atlantic region, and South Mountain was an important source for this material. Excavation of the largest quarry pit at the site was completed over the summer of

2020. This site is important because it is only the second rhyolite quarrying site excavated on South Mountain and has given us insight into prehistoric quarrying techniques. At this location subsurface float was actively sought while the bedrock was largely ignored. Large subsurface float was battered in place, while smaller float was removed and reduced. Experiments showed that both surface and subsurface stone would produce a useful edge; however, the subsurface material was easier to work. Quarrying that focused on subsurface float produced several distinctive characteristics, such as displaced B horizons, radial mixed soil/cultural horizons, and layered channers and flags. Our current estimate is that approximately 2m<sup>3</sup> of material was removed from the pit, not accounting for any surface material removed. The excavation of this site has given us a clearer picture of the prehistoric techniques used to access workable rhyolite and allowed us to fine-tune our understanding of prehistoric quarrying.

**Shenika McFarlane-Morris, Church Teacher's College and Megan Heckert, West Chester University of Pennsylvania: Climate Change and Precarious Livelihoods among Women in Coastal Jamaica**

Climate change poses severe threats to the food security, environmental stability, health and prosperity of Small Island Developing States. Even though women bear unequal gendered impacts of climate change, there is limited research on how it affects them and their livelihoods. Using Jamaican coastal communities as case studies, where single parent families are prevalent (nearly 50% of households are headed by females) we approach this study with a two-pronged objective. Firstly, to compare the level of environmental exposure of these communities to climate change- particularly-sea level rise, coastal erosion and more intense storms- and secondly, to analyse the economic precariousness that these environmental dynamics create for women. Preliminary data was collected through a feminist research approach, where in-depth interviews were the primary methods of data collection. The focus was on these women's roles within their households and their perceptions and experiences with the ensuing challenges of climate change and how they dynamize these roles. We also used GIS to model the locations of these economic activities, showing which ones are the most vulnerable. The research found that there is a clear gendered division of labour, with the men traditionally being the ones to do the fishing and fixing the boat engines but in the past two decades the women have moved away from staying at home to carving out livelihoods for themselves through scaling, cleaning and the selling of fish as well as working in seafood restaurants on the shore. This is consistent with other studies of climate change vulnerability in Jamaica. With the majority of these women being unmarried with children, they have become highly reliant on these economic activities to sustain themselves and their families. However, the rising sea level, combined with more intense storms have made these women uncertain about their future in coastal livelihoods. Climate change is exacerbating the cycle of poverty among women through such events as loss of property; disruption in fish-selling and costs for mitigation against coastal flooding. This paper calls for empowerment opportunities for these women, including increasing their literacy and acquiring additional job skills which will be useful in adapting to survive and care for their dependents.

### **Julaiti Nilupaer, Penn State: Utilization of Crowdsourcing and Volunteered Geographic Information in International Disaster Management**

Large-scale disasters result in enormous impacts on vulnerable communities worldwide, and data acquisition has become a major concern in this time-critical situation: the limitations of geospatial technologies impede the real-time data collection, also the absent or poor data collection in some regions. With the current advances of Web 2.0, crowdsourcing and Volunteered Geographic Information (VGI) have become commonly used. As a potential solution to fill the gap of real-time geographic data, crowdsourcing and VGI enable timely information exchange through a voluntary approach and enhance amateur citizen participation. Importantly, such geographic information can substantially facilitate emergency coordination by fulfilling the needs of impacted communities and appropriately allocating relief supplies and funds. My research interest centers on the utilization of crowdsourcing and VGI for disaster management. Particularly, I work to explore their potential value and contributions by reviewing two notable and destructive disaster events as case studies: the 2011 Tohoku Earthquake and Tsunami, and the 2013 Typhoon Haiyan. In addition, I examine the challenges of this information and seek potential solutions. This research aims to contribute a comprehensive qualitative analysis of how Volunteer and Technical Communities (V&TCs) have used crowdsourced data and VGI to enhance the coordination of disaster management.

### **Sydney Oluoch, Montclair State University: Public preferences for Longleaf pine restoration programs in the South Eastern United States**

Longleaf pine (LLP) (*Pinus palustris*) is well known for its role in supporting healthy ecosystems in the southeastern US. The decline of LLP forest ecosystems has resulted in consensus for restoration between different stakeholders. However, there is still a lack of robust understanding of the economic sustainability and implications of planting LLP due to the lack of information about the economic performance of non-market benefits of LLP forests. These challenges have presented major barriers to landowner acceptance of LLP restoration programs that offer incentives. The need to understand tradeoffs between forest ecosystem services is essential to the expansion of LLP in SE US. This study implements the Best Worst Choice (BWC) method to analyze public preferences toward hypothetical LLP restoration programs that consider ecosystem services such as recreation, timber production, carbon sequestration, water yield, and wildlife diversity. A representative sample of n=953 respondents from Alabama, Mississippi, Georgia, and Florida completed an online survey. From the BWC method, we found that residents in all four states value and are willing to pay for wildlife conservation, followed by carbon sequestration and forest recreation. The study yields key outputs for policymakers to assess LLP reforestation and management programs from a public perspective.

### **Sheoveney O'Bryan, Church Teacher's College: The Challenges of Farming in Manchester, Jamaica**

Greenhouses are now being widely used all over the world as they serve as an advantage for farmers by creating an oasis for crops. More specifically they provide ventilation, adequate sunlight, humidity, temperature and even protection against insects that will cause harm to the

crops. The aim of this research was to gain an insight into the activities of greenhouse and peasant farmers with particular focus on the challenges they encounter as well as the solutions they are employing while being part of the agricultural sector in the parish of Manchester, which is located in west-central Jamaica. Manchester is known for its high-quality production of citrus, bananas and ground provisions such as yam, but has its agricultural productivity has challenged in recent times by issues relating to climate variability. Data was collected within a qualitative framework and includes: photographs, Google Earth images, observations and semi-structured interviews of two farmers. The study reveals that both greenhouse and peasant farmers are faced with many environmental challenges such as insects and rainfall-related damages, forcing them to respond by a myriad of solutions that cut into their profit margins, including the use of fungicides, pesticides, farm pond, drainage system and a sanitation strategy. This study is a comparative analysis between greenhouse farming and peasant farming.

**Meghann Smith, Pankaj Lala, Sydney Oluoch, Neeraj Vedwan, Andrew Smith, Montclair State University: Hard Apple Cider Consumer Valuation of Sustainable Attributes: a case study of the US Mid-Atlantic States**

Hard apple cider is the smallest, but fastest growing sector within the alcoholic beverage industry in the United States, and opens a unique opportunity for agricultural entrepreneurship amongst apple orchard owners of all sizes. To support sustainable industry development, it is important to understand which attributes of 'sustainability' are most valued to customers, and how those values translate to their willingness to pay a premium for sustainably produced goods. The US Mid-Atlantic represents a region in the country with the largest market share of cider sales, ample apple production volume and potential, and a supporting network for continued development of the cider economy. We surveyed 630 hard apple cider consumers residing in this region. By using the best-worst choice, we presented a two-tiered method which estimated a hierarchal relationship among sustainability attributes that affect a consumer's intention to purchase at different price points. Our results showed that respondents do value sustainability attributes, and in many circumstances are willing to pay a premium; however, there were some discrepancies which point to a key challenge in consumer behavior research: the attitude-behavior gap. Effective communication of the specific actions and inactions that take place in sustainable management practices is necessary to convey the proper message to potential consumers. By bridging this gap, hard apple cider producers can better position their product, convey important environmental information, and have consumers value their products in a way that make the additional resources allocations to incorporate sustainability metrics prudent in terms of enhanced product profitability.

**Stephen Sullivan, Sacred Heart Academy, Hempstead, NY, and Columbia University and Christine Sullivan Pulgrano, East Williston School District: Using Children's Literature as a Tool to Teach Geography**

By using children's books to highlight the essential elements of geography, we can integrate ELA, social studies, science and more into a single, memorable unit. The only limit is our collective imagination. *A River Ran Wild* (Cherry 2000) directly links all six elements to the

Nashua River Valley as the area goes from pristine to polluted. The House on Maple Street (Pryor 1992) takes readers on a 300-year adventure – told by child archeologists. Mixing nonfiction (The Kid Who Changed the World, Andrews 2014) with fiction (Town Mouse/Country Mouse; Brett 2003) offers more choices. Bring your own favorites.

### **Tao Tang, SUNY College at Buffalo: UAV-based high spatial and temporal resolution monitoring of surface moisture status in a vineyard**

Drone-based RGB and thermal infrared remote sensing are rapidly becoming useful tools for monitoring crop and soil status for precision farming. The objectives of this study are: 1) flying UAV or drone to collect large spatial scale RGB and infrared aerial images during the growing season; and 2) producing high spatial-temporal resolution digital surface models (DSMs) and imagery mosaics to help farmers monitor surface moisture status in the study vineyard. A total of four field aerial surveys were conducted during the growing season of 2018 from May to August. A surface moisture mapping index (SMMI) model was proposed based on modified normalized difference water index (NDWI) and topographic wetness index (TWI). This model combines the factors of both radiant reflection properties by moisture bearing surfaces of a farming field, and the slope gradient and micro-topographic positions in the field. The results indicate that the spatial pattern of SMMI, or the relative quantities of surface moisture contents, across the vineyard was maintained the same during the entire growing season. This might be impacted by localized factors of surface slope gradient and topographic positions. Meanwhile, temporal variations of surface moisture status are mainly influenced by frequency and intensity of the precipitations.

### **Falon Treis and Zsuzsanna Balogh-Brunstad, Hartwick College: Sediment and Nutrient Load of the Charlotte Creek Watershed in New York State**

Sediment and nutrient load in river systems has been studied for over 100 years. Global averages of sediment transport from continents (denudation) and dissolved chemical transport to the oceans are well characterized. However, most of the understanding is coming from baseflow and normal flow measurements, but the spatial and temporal understanding of individual watersheds are still lacking. The goals of this study were twofold. The first goal was to characterize the Charlotte Creek watershed in terms of both chemical and physical parameters during base/normal flow conditions to determine spatial variations within the watershed. The second goal was to investigate the impacts of storm (rain) events on the sediment and nutrient load of Charlotte Creek. To complete these goals a one-time sampling campaign was executed to collect water samples throughout the watershed using a grab sampling technique, then an autosampler was set up at a selected location to monitor discharge and collect samples at specified time intervals. After the autosampler failed and I had to move to manual sampling once every 24 hours. All collected samples were analyzed using various field probes for common field parameters, such as pH, temperature, total dissolved solids, dissolved oxygen, and suspended sediment was estimated via turbidity measurements. In the laboratory, the samples were analyzed for cation and anion composition, total nitrogen and phosphate concentrations, and dissolved silica content using various standard analytical methods and

equipment. This study provided preliminary information about hydrological dynamics, sediment, and nutrient load during storm events.

### **Stephen Tulowiecki, SUNY Geneseo: Constructing a spatial database of historical accounts of past Native American fire use**

The past several decades have seen scholarly debate surrounding the severity and geographic extent of forest modification wrought by Native American land-use practices such as burning and agricultural clearing. Scholars have renewed this debate recently in arguing whether modern forest management should incorporate controlled burning to recreate early-successional and/or pyro-climax landscape conditions seen under Native American land stewardship, or whether land management objectives should focus on restoring late-successional forests for carbon sequestration. One common data source used to understand past Native American modification are historical accounts of fire use from early histories and traveler journals. However, no systematic effort has been conducted to catalog and map such accounts. This presentation covers an ongoing project to document historical accounts of Native American fire use. Through a combination of revisiting past scholarly works that compiled historical accounts, along with the use of modern information retrieval and text mining techniques to discover previously unknown accounts within digitized historical documents, this project seeks to create an exhaustive spatial database of such accounts. Efforts have so far discovered over 200 accounts of past Native American fire use in the northeastern and Midwestern US. Although accounts vary with respect to positional accuracy and overall veracity, this project has discovered previously-unknown primary accounts of fire use or landscapes recently impacted by Native American burning. This spatial database of historical accounts will be a valuable resource for geographers, ecologists, and land managers for understanding past Native American land-use practices and its effect on forests.

### **Matthew Walter, University of Delaware: Invasive Species Mapping in Estuarine Wetlands Using High-Resolution Aerial Imagery**

*Phragmites australis* is a widespread invasive plant species in the United States that greatly impacts wetlands by creating dense patches and outcompeting other plants. The invasion of the plant into wetland ecosystems is known to decrease biodiversity, destroy the habitat of threatened and endangered bird species, and alter biogeochemistry. While the impact of phragmites is well-known, the extent to which the plant affects wetlands is not known across the United States. Through the use of high-resolution imagery from the National Agricultural Imagery Program (NAIP), *Phragmites* is mapped for the entire state of Delaware. Normalized difference vegetation index (NDVI) and principal component analysis (PCA) bands are generated from the NAIP data and used as inputs in a Random Forest classifier to achieve a high overall accuracy for the *Phragmites* classification of around 97%. The classified map has a spatial resolution of 1m and documents the spatial distribution of phragmites throughout the state (around 17% of all plants in estuarine wetlands). Such detailed classification could aid in monitoring the spread of this invasive species over time and would inform decision-making process for landscape managers.



## **Benjamin Weigner, UCLA: COVID-19 and the climate crisis in Israel/Palestine: Converging geographies of exception**

Drawing on the quasi-State of Palestine's and the State of Israel's respective National Communication reports to the UN Framework Convention on Climate Change, I comparatively examine the uneven production of national environmental discourses around climate change. This comparative discourse analysis questions how climate planning, with its own set of immense uncertainties, operates within already uncertain political geographies of conflict amidst uneven territorial struggles for statehood and sovereignty. Under an apparatus that privileges the sovereignty of nation-states, these climate reports unsettle and expose the institutional inadequacies and constraints of climate planning. Situated in (geo)political ecological, settler colonial, and Indigenous climate justice literatures, this analysis pays particular attention to the historical and ongoing structures of erasure and occupation that precondition adaptation to climate change and decolonial struggles for justice. I seek to locate the inherent exclusions, limitations, and conditions under which climate planning has been forged to bring forth a new space for political futures and climate justice. This presentation will engage with recent mass uprisings spurred by COVID-19 in Israel/Palestine which have begun to push the rather limited, nascent, and apolitical Israeli climate movement towards a more radical, anti-state politics that may define the future of climate justice in this precarious territory.

## **Taylor Wiczerak, Montclair State University: Public Perception and Willingness to Pay for Green Infrastructure and Improvements in Northern New Jersey Using Discrete Choice Experiment**

Significant water pollution caused by flooding due to heavy precipitation and extreme weather events such as Hurricane Sandy and similar storms of the past have become a considerable problem. Urbanized areas of northern New Jersey experience heavy downpour-related contamination and water pollution when stormwater and untreated sewage are diverted through old drainage systems to adjacent water bodies. These contaminated discharge events are from combined sewer overflows (CSOs), which many municipalities in the United States and abroad have used green infrastructure (GI) to mitigate. However, while the effects of CSOs and the ability of green infrastructure to reduce them are well documented, there has been considerably less study addressing public perception and willingness to pay for GI-based solutions. As such, this study seeks to understand these facets of GI management in urbanized areas of New Jersey, including Newark, Paterson, and Elizabeth. A discrete choice experiment method was used to analyze the willingness of residents to pay for improvements to CSO infrastructure through the assimilation of green infrastructure such as bioretention gardens, rain barrels, and green roofs, and to identify attributes (such as secondary benefits, proximity, and water retention). The analysis also sought to understand how different factors such as age, economic status, and ethnicity, in addition to perceptions of environmental problems and governmental action, affect willingness to pay for and overall perceptions of green infrastructure improvements. We found that respondents were mostly willing to pay for green infrastructure annually and as a one-time payment, and had overall positive outlooks on green

infrastructure while citing some concerns about existing infrastructure. These findings are important in assessing the overall attitude towards these fixtures, and may be critical in crafting local policy and development, especially in terms of environmental equity.

### **Shengyuan Zou, SUNY Buffalo: Detecting Individual Abandoned Houses from Google Street View: A Patch-based Deep Learning Approach**

In the U.S. legacy cities, abandoned houses are focal points in urban communities by threatening local security, devastating housing markets, and burdening government finance. Abandoned house detection provides detailed land use information in such urban environments, which is essential for the society. Previous abandoned house detection studies relied on existing field survey data and socioeconomic data, which have considerable limitations in generalization. In this paper, we proposed the first method to automatically detect abandoned houses from Google Street View (GSV) images. Two visual features of abandoned houses, deteriorated building facades and unmaintained vegetation, bring the opportunity to identify housing abandonment from GSV images. To better present these visual features, we propose a patch-based deep convolutional neural network (CNN) approach, including the following three steps. First, patches are extracted from the image using a variant of dense scale-invariant feature transform algorithm and pre-classified into two categories, building and vegetation. Then, a transfer learning approach is implemented separately for building patches and vegetation patches. Finally, decisions at the patch level are fused to the scene level. The experimental results show that the overall detection accuracy is 81.9%. The performance of the proposed patch-based method overcomes the scene-based method. GSV data source and the patch-based deep learning approach empower the detection model by providing a new observing perspective and involving knowledge from visual interpretation. Also, thanks to data accessibility and the automatic processing approach, the proposed method is notable in effectiveness and generalizability to detect abandoned houses in a regional study.

## **ABSTRACTS: POSTER PRESENTATIONS**

### **Anish Adhikari, Jing Gao, University of Delaware: Global gridded GDP products: A comprehensive qualitative and quantitative review of uncertainties and fitness-of-use**

Gross domestic product (GDP) is one of the most useful and widely used indicator to measure economic development. Spatially explicit gridded data products are an increasing area of research with applications in fields ranging from development activities, humanitarian crises, natural disasters, pollution monitoring to policy making at local, national and regional levels. Gridded GDP products help to understand the socio-economic dynamics in these different applications when combined with other spatially-explicit gridded products such as population, emissions, agriculture, and precipitation among many. This paper focuses on a systematic review and comparison of the most comprehensive gridded GDP data products available to date by discussing them through qualitative and quantitative methods. It focuses on analysing their underlying approaches and input data to determine their goodness-of-fit and to fully

understand the characteristics of the products. This paper's goal is to help the data user community make informed decisions on the appropriateness of selecting a particular dataset for their set of applications and analysis. We found that the GDP data products show their differences coming fundamentally from the underlying gridded population datasets that they use. Analysing case studies for United States and India (scenarios of highly developed and rapidly developing nations), we found interesting results on how the datasets behave and how accurately they predict the GDP estimates in accordance to national statistics. Furthermore, in contrast to gridded population datasets, use of auxiliary variables apart from population count itself is negligible and we believe that could significantly increase the accuracies of the data products.

**Matthew Friedman, Oceanside High School, and Mia Frattura, General Douglas MacArthur High School: From Philadelphia to Portland: The American Climate in 1897**

In certain occasions, limited numerical data is available regarding the historical climate, but primary sources such as diaries can help researchers gain insight into this topic. By expanding the body of knowledge about the historical climate, researchers can make comparisons with the modern climate and discoveries of climate change's current effects can be assessed to make predictions of the future. This study examined the 1897 diary 9000 Miles on a Pullman Train to obtain a deeper understanding of aspects of the historical climate including precipitation patterns, temperature, and agriculture through content analysis. It was found that precipitation patterns expanded further West than they do today. Moreover, qualitative analysis of the daily temperatures described suggested that the modern relationship between regional temperatures across the United States was similar in 1897. However, factors such as high elevation snow cover recorded in the diary was found to be greater than today's suggesting an increase in overall temperature. This was corroborated by the shorter historical growing season. The diary also allowed for the examination of natural disasters and the population of individual towns. The lack of quantitative data in the diary limited rigorous statistical analysis, however, the qualitative information was able to contribute to an expansion of knowledge regarding the historical climate.

**Ryan Harbison, Kutztown University: Precipitation Variation and The Effect on Major League Baseball Postponements: A 50-Year Study**

Altercations in precipitation patterns across the United States can impact economic and tourism of a specific region. Every spring, summer, and early fall, many people attend Major League Baseball (MLB) games at different stadiums within the United States and Canada. While changes in precipitation have been well-documented in climate literature, potential impacts on rainout events in MLB have not been a focal point of climate literature. Rainouts can have impacts on the economic and transportation geography within a city, especially near the stadium. This study aims to address changes in rainout probability by assessing baseball seasons from 1950-2018 and then comparing the resulting trends to what is projected by the US National Climate Assessment.

**Mary Kenny, Montclair State University: A Spatial Analysis of Community Solar Potential in NJ**

Climate change is a growing concern in New Jersey. Both state and non-governmental agencies have come together to reduce the state's greenhouse gas emissions in an effort to mitigate the impact of climate change. These state initiatives are providing guidance for the renewable energy sector to expand its market in order to support a clean energy future. Re-Powering Sites, a new initiative associated with the Energy Master Plan (EMP), is a program that enables communities to repurpose sites that have little, if any, development potential for renewable generation. However, limited funds are available, and thus optimal sites for RE-Power need to be selected. We propose a solar suitability study based in New Jersey that is constructed around current state policies specifically restricted to electronic distribution companies (EDC) territories. The crux of this model will be on repurposing degraded or underutilized land and building upon past suitability studies. The model will account for locations with a high potential to utilize solar energy while accounting for other social and environmental characteristics. Analytical Hierarchy Process (AHP) will be the technique used in this Multi-Criteria Decision Analysis (MCDA) to interpret environmental, social, and economic factors that should impact community solar site locations. By providing a spatial analysis of electric distribution companies (EDC), community solar capabilities that are assessed can enable the Board of Public Utilities (BPU) to select ideal community solar sites that best allocate available funds.

### **Angelina Kramer, Sacred Heart Academy, Hempstead, NY: Spatial Patterns in PM2.5 Air Quality on Long Island**

As human population expands and industrial production increases there has been a consequential and dramatic increase in air pollution levels, particularly *PM2.5*. *PM2.5* refers to particles that have a diameter less than 2.5 micrometers and remain suspended for longer. They are formed as a result of burning fuel and chemical reactions that take place in the atmosphere. Levels vary in different regions due to the changing temperature, weather normality's and other associated factors. The main goal of this research was to determine how the climate and external factors (location, degree of foot and car traffic, and whether there are factories in the area) of a region affect the concentrations of *PM2.5* pollutants in the air. Understanding the relationship between the variables is paramount in maintaining the state of the world around us and ones' health in spite of the continued deterioration of the earth. The methods used to collect data were the regular collection of air quality samples at four different locations around Queens and Long Island within a span of two months. The air quality monitor HUMA was used to record levels of *PM2.5*, VOC, AQI, and temperature. In addition, the time, precipitation, wind speed, cloud cover and descriptions of the collection sight were also recorded. After analyzing the data, a direct relationship was found between temperature and pollution; the higher temperature correlated with higher *PM2.5* concentrations. Lastly, in the areas with the most surrounding variables, such as proximity to industrial plants or heavy transportation routes, there is an increasing trend in pollutant levels. These findings underscore the importance of finding more environmentally friendly ways of production and transportation, especially in close proximity to residential areas in order to protect the health of those who frequent the area and the states of the environment around the area.

### **Shaquille Landell, Church Teacher's College: Issues with small scale farming in Jamaica**

The purpose of this research was to investigate the different farming techniques used by small farmers within the small island developing state of Jamaica. It also sought to explore the issues they face regularly, along with the solutions that these farmers have created to minimize the effects of such issues. The study was conducted within a qualitative framework, with the use of Semi-Structured Interviews (SSIs), photography, and observation as the primary methods of data collection. A total of 8 small farmers were interviewed within the same agriculturally dominated community, Paul mountain, which is in the parish of St Catherine. Through the research, the interviewed farmers stated their most trusted and relied upon techniques of farming; these techniques regularly aid the farmers to yield the most profit from their acres of land. The research revealed that small scale farmers face their fair share of issues, many of which have led to some even considering permanently closing their pens and retiring. Lastly, the study revealed what solutions that these farmers have implemented to combat these troublesome issues, so that they may continue to carry on their profession and support themselves and their families. The effectiveness of these solutions vary however, based upon different factors mentioned in the report, such as available workforce along with the state of the respective tools and equipment.

### **Caitlyn Linehan, CUNY Lehman College: Accessibility and Connectivity of Bike Paths to Select Facilities for Bronx, NY Residents**

It is widely known that cycling as a form of physical activity provides substantial health benefits and psychological benefits, including reducing stress and anxiety. However, a great deterrent to cycling for many residents is the lack of a connected bike path that would take them from their point of origin to their destination safely. The expansion of biking networks throughout urban areas would provide residents easier access to exercise and an alternative method of transportation. This study aimed to determine a low stress biking network for Bronx residents and to assess the accessibility of various health and educational facilities: libraries, recreation centers, and parks. A low stress biking network was determined based on roadway size and attributes and bicycle accommodation. Next, network analysis and an origin destination cost matrix was used to calculate how many of the facilities of interest are accessible to Bronx residents using the low stress network. From this study it was concluded that 53.7% of the population did not have bike accessibility to libraries, 89.25% did not have access to recreation centers, and 7.77% of the population did not have access to parks. This case study highlights the lack of accessibility for cyclists in the Bronx to reach these vital facilities and the potential and need for a connected and low stress biking network for residents of the Bronx.

### **Loonibha Manandhar, Jing Gao, Fengyan Shi, University of Delaware: Quantifying the Uncertainties of Anticipated Societal impacts in modelling a 1-in-100 year Flood in Delaware**

The estimation of the projected exposure to sea level rise and coastal storm surge has been important in informing risk mitigation strategies. Probabilistic estimates of sea level rise values now replace deterministic ones and projections of population are available in terms of alternate plausible trajectories across Shared Socioeconomic Pathways (SSPs), resulting in a range of different values increasingly used in literature. This paper quantifies and compares three sources of uncertainties of anticipated societal impacts for a 1-in-100 year storm in Delaware at

the end of the century namely, the type of modelling method used, climatological parameters and socioeconomic parameters. A simplistic bathtub-type model and a hydrodynamic FUNWAVE-TVD model were both used to map the spatial patterns of inundation extent for the different sea level rise (SLR) values. Exposure in terms of population and urban land was then quantified across different SLR-SSP pairings and the range of impacts across the three sources was compared. Results show that modelling methods are the largest source of uncertainty, followed by climatological parameters and the least uncertainty is due to socioeconomic parameters. Furthermore, static models overestimate inundation by 180-250% as compared to dynamic models resulting in 4,000-15,000 more people under the threat of inundation in 2100. This study reinforces the pronounced impact of the type of modelling method used towards estimating exposure to coastal flooding. Furthermore, we also conclude that climatological factors like sea level rise drive human exposure more than socioeconomic projections of population and urban land in Delaware.

### **Gregory Pope, Montclair State University: The Use of Green Pond Conglomerate as Building Stone in Morris County, New Jersey**

Green Pond Conglomerate (GPC) is a maroon colored quartzite with white quartz pebbles, a classic “puddingstone”. GPC derives from a NW-SW-trending sliver of Paleozoic sediments, the “Green Pond Outlier”, surrounded by older metamorphic and igneous rocks of Morris and Passaic Counties. Buildings, retaining walls, field fences, and monuments incorporate the durable and attractive stone, in a distinct geographic area of Morris County. Several instances of structures completely constructed or faced with GPC occur in and around Morristown, limited to affluent houses and one prominent church. In these cases, GPC stones were dressed and faced, a labor-intensive effort. Elsewhere in the county, GPC forms decorative accents to fences and walls, or in most cases, comprises a portion of the undressed rounded fieldstones in buildings and field fences. No historic GPC quarries are noted, so the source of the building stone is from glacial sediments. The Pleistocene continental ice advances crossed and eroded the Green Pond outcrop from the north and northwest, depositing GPC boulders to the Illinoian and Wisconsinan moraines, terminating just north and east of Morristown. Isolated Pre-Illinoian deposits exist as far south as Somerset County, which may contain rare GPC cobbles. From Morristown and south, GPC as a building stone would likely have been imported. North of the terminal moraines, GPC is common and probably proportional to distance from the bedrock source. Ongoing research seeks to quantify the proportional frequency of GPC in human structures and in the glacial sediments.

### **Arachna Prasad, Montclair State University: Exploring changing vegetation dynamics of Northeastern US in 2041-2070 using downscaled, bias corrected CMIP6 data**

Climatic patterns are expected to change significantly within the next few decades, with some impacts of these changes already felt across the world. Parts of Asia, Europe, and North America, for example, have seen increases in vegetation greening and browning. Climatic zones have expanded or shifted because of the changes in climate patterns. The northeastern United States has experienced an overall increase in temperatures by nearly 2° F, increased frequency of precipitation events with a near 70% increase in precipitation, and sea level rise of approximately 12 inches. These changes already have had impacts on vegetation in the Northeastern United States, and with expected climate change, will further affect vegetation

dynamics. The Coupled Model Intercomparison Project (CMIP) has recently released improved climate data from several Global Circulation Models (GCMs), updated to include more emissions scenarios and varied economic paths. In this poster presentation, methods to explore changing vegetation dynamics with regards to climate change using the 6th generation of CMIP data in emissions scenarios RCP 4.5 and 8.5 are discussed.

**Nawal Shoaib, Montclair State University: Life Cycle Analysis of a floating offshore wind farm in New Jersey**

Wind energy power plants have seen a tremendous growth over the past few years. As countries strive to become carbon neutral and reduce their greenhouse emissions, the need for new renewable energy power generation increases. New Jersey, USA, has been diligently working towards this cause, as the State aims to be carbon neutral by 2050. As wind energy is an abundant resource amongst coastal states, offshore wind farms have gained momentum in early development. This thesis aims to calculate the environmental impact of the construction, operation, and decommissioning of a 1.1 GW offshore wind power plant along the New Jersey coastline using a cradle-to-grave Life Cycle Analysis (LCA) environmental assessment technique. This study aims to closely represent New Jersey's developing plans in collaboration with Orsted's Ocean Wind proposal, and will explore different scenario analysis including material suppliers, grid connections, and recycle options.

**Olivia Teng, Herricks High School: Identifying Factors Related to Vulnerability, Preparedness, and Resiliency in Long Island and New York City**

In October 2012, the U.S. East Coast received extensive damage from Sandy. Due to the lack of tropical cyclones impacting this area, residents' vulnerability, preparedness, and resiliency during such events is understudied. Research in areas that more regularly experience flooding from tropical cyclones, such as Texas, has shown that income correlates well with individual susceptibility to damage and overall resilience to flooding. Employing the use of a survey, this study evaluated if a similar connection between income, related demographic factors, and vulnerability exists for New York City and Long Island residents. It was hypothesized that regardless of economic status, individuals with more social capital would be better prepared and informed about resources. Therefore, these individuals would be predisposed to easier preparation and recovery. However, the results were insignificant as the infrastructure of and services in a community were not definitively better indicators of ability to plan for and overcome flooding than finances. As hurricanes are rare in New York, participants were hesitant to take proactive measures both preceding and following Sandy. This finding demonstrates the need for better education and resources for all residents in areas where personal flood safety is not prioritized. The study was limited by the backgrounds of the participants: each demographic was unequally represented. However, by surveying more people, possibly in a different area of the country, this issue can be mitigated. Additionally, similar research in the future can inform improved flood risk communication, as well as flooding management plans and policies.

**Macy Turner, Kutztown University: Urban Heat Island and Heat Waves**

Urban heat islands are increasingly becoming prevalent in modern day society as the effects of global warming have devastated urban communities across the world. Global warming has caused these heat islands to warm over time to temperatures warmer than the surrounding areas. Heat waves caused by global warming can be detrimental to one's own health if not taken seriously. Previously, climate change was thought to only have environmental impacts, but now are also being seen as a direct human health impact. Studies have shown how incremental temperature increases have led to an uptick in emergency room hospitalizations. By using thermal imaging, we incorporate the overarching notion of climate change onto what future trajectories may hold if change is not made, and the consequences that the urban heat island effect may have if temperatures begin to rise higher anthropogenically in the future.

**Vishruta Yawatkar, Elizabeth Nguyen, Matthew Walter, Kate Tully, Pinki Mondal, University of Delaware: Quantifying Land Cover Changes due to Saltwater Intrusion within the Delmarva Peninsula Using Machine learning Approaches and Remotely Sensed Imagery**

Saltwater intrusion is a critical issue prevalent in coastal areas. It can have major effects on upland salinity and can thus lead to land cover changes. These effects can have consequences in terms of agricultural land abandonment and/or changes in crop selection by farmers over the years. In this study, we examined the impact of saltwater intrusion in the Delmarva Peninsula, USA on different land cover types, including forest and agricultural land. We used a machine learning algorithm, random forest (RF), available on the Google Earth Engine (GEE) platform to classify different land covers using the imagery collected through the National Agriculture Imagery Program (NAIP) during 2011 and 2017. We performed an accuracy assessment using validation data collected using a combination of methods, such as visual inspection of the NAIP imagery and field visits to collect ground truth observations. Preliminary results indicate an accuracy of the classified maps in the range of 71.3% 82.7%. The information generated by this study is vital to identify areas with the highest saltwater intrusion impact, which can inform agricultural land management and policy measures in the region.