61st Annual Meeting of the
Florida Society of Geographers
1964-2025

TURLINGTON HALL, UNIVERSITY OF FLORIDA

February 21-23, 2025

Hosted by

UF | UNIVERSITY *of* FLORIDA
College of Liberal Arts & Sciences
Department of Geography

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About our Organization

The Florida Society of Geographers was chartered in 1964 as a non-profit organization for the purpose of furthering professionalism in geography through the application of geographic techniques in all areas of education, government, and business. The Society supports these objectives by promoting acquaintance and discussion among its members and with scholars and practitioners in related fields by stimulating research and field investigation, by encouraging publication of scholarly studies, and by performing services to aid the advancement of its members and the field of geography in Florida.

FSG website: https://floridasocietyofgeographers.org/
The FSG publishes the *Florida Geographer*, available to the public on-line http://journals.fcla.edu/flgeog

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Conference Assistants: Zainab Ali and Erin Mariotti, UF

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Program at a Glance

Friday, February 21st
5:30 – 8:00 p.m**.**   Informal Reception (Turlington 1215**)**

Saturday, February 22nd
8:00 a.m.– 8:45 a.m.   Registration (Turlington 3rd floor)
8:50 a.m.– 9:00 a.m.   Welcoming Remarks (Turlington 3018)

Paper Session 1
9:00 – 10:00 a.m.   Paper Session 1A (Turlington 3018)
9:00 – 10:00 a.m.   Paper Session 1B (Turlington 3012)
9:00 – 10:00 a.m.   Paper Session 1C (Turlington 3006)

Paper Session 2
10:15 – 11:00 a.m.   Paper Session 2A (Turlington 3018)
10:15 – 11:00 a.m.   Paper Session 2B (Turlington 3012)
10:15 – 11:00 a.m.   Paper Session 2C (Turlington 3006)

Poster Session 1
11:00 – 12:00 p.m.   Poster Session 1 (Turlington 3rd floor - Hallway)

Lunch
12:00 – 1:00 p.m.   Light lunch provided (Turlington 1215)

Paper Session 3
1:00 – 1:45 p.m.   Paper Session 3A (Turlington 3018)
1:00 – 1:45 p.m.   Paper Session 3B (Turlington 3012)

Paper Session 4
2:00 – 2:45 p.m.   Paper Session 4A (Turlington 3018)
2:00 – 2:45 p.m.   Paper Session 4B (Turlington 3012)

Poster Session 2
2:45 – 3:45 p.m.   Poster Session 2 (Turlington 3rd floor - Hallway)

FSG Banquet & Awards (Reitz Union 4th floor - Arredondo)
7:00 – 9:30 p.m.   Banquet dinner
7:30 – 8:00 p.m.   Keynote speaker **–** Cynthia Barnett
8:15 – 8:45 p.m.   Awards presentation
8:45 – 9:00 p.m.   Closing remarks

Sunday, February 23rd
9:30 – 11:00 a.m.   Business Meeting (Turlington 3018)

Adjournment—Have a safe trip home!

Keynote Speaker:

CYNTHIA BARNETT

Author and Journalist
University of Florida
https://www.cynthiabarnett.net/about

Keynote Presentation: Words of Wonder, Words of Warning: Communications for Changing Times:

When the Florida Society of Geographers was chartered in 1964 as a nonprofit to further professionalism in the field, its first president, Dr. Robert Fuson, told The Tampa Tribune that he felt the most important purpose of the new society was actually communications: "We're trying to combine both the academic and practical aspects of geography," he said, "with people on both sides and the people of the state benefitting." The Society dove headlong into politics in that tumultuous year, recommending a logical plan for the state's patently unfair Congressional districts.

Today, with growing numbers of the people of the state—and the people of the globe—skeptical of scientists' work from climate models to vaccines, it's more vital than ever for geographers to bridge the practical and the academic. To bridge the widening gap between science and society. And yes, even to bridge the political divide. As the scientists who work on the places we call home; on our freshwaters and coasts; on our weather and climate; and on the hazards we face, you have the knowledge and the stories that unite people around shared values. Keynote speaker Cynthia Barnett lays out the communications and storytelling approaches that stress the values and strengthen the bridges—even over choppy waters and in trying times"

Speaker Biography: Cynthia Barnett is an award-winning author and journalist who has covered water and climate change stories worldwide—reporting from the rainiest place on earth in Cherrapunji, India, on epic drought in Perth, Australia, or on the American folly of building in swamplands with too much water and deserts without enough.

Her latest book, *The Sound of the Sea: Seashells and the Fate of the Oceans*, was named one of the best science books of the year by NPR's Science Friday. "The seashell might seem a decidedly small foundation for a book," The New York Times wrote, "but Barnett's account remarkably spirals out, appropriately, to become a much larger story about the sea, about global history and about environmental crises and preservation."

Barnett was a longtime newspaper and magazine staff writer before diving full time into water. Her Knight-Wallace Fellowship researching freshwater history and science at the University of Michigan led to her first book, *Mirage: Florida and the Vanishing Water of the Eastern U.S.*, later named by the Tampa Bay Times as one of the top 10 books that every Floridian should read. Her second, *Blue Revolution*, which calls for a new water ethic for the United States, was named one of the best science books of the year by *The Boston Globe*. *Rain: A Natural and Cultural History*, her third book, was longlisted for the National Book Award; a finalist for the 2016 PEN/E.O. Wilson Literary Science Writing Award; and included on a number of best books of the year lists. In 2015, Barnett returned to her alma mater, the University of Florida College of Journalism and Communications in Gainesville, to develop the college's Environment, Climate and Science Journalism program. Her many journalism awards include a national Sigma Delta Chi prize for investigative magazine reporting.

Paper and Poster Presentations – **Saturday, February 22**

Reminder to speakers: If using a digital projector, please bring your file on a USB flash drive to the room at least ten minutes prior to the beginning of the session. Once the room opens someone will be there to assist you in uploading it onto the laptop. It is important that your file be uploaded and open on the computer so that you can begin your presentation at the scheduled time. Note that each paper time slot is 15 minutes long: 12 minutes for the paper presentation followed by 3 minutes for questions and answers for the group. Please respect the session chairperson's time cues.

* Student

Paper Session 1A (Room 3018) - 9:00 – 10:00 a.m.
GEO AI & GIScience I

9:00 - Imani Ford*, Bethune-Cookman University, Assessment of Urban Stormwater Systems for Improved Urban Habitat and Estuarine Ecosystem Management

9:15 - **M. Anwar Sounny-Slitine**, University of Florida, A Dynamic Radial Method for Quantifying Environmental Justice: Assessing Racial Disparities Near Superfund Sites in Florida

9:25 - Morgan Metrailer*, University of Florida, Identifying dominant trade distributors and potential co-mingling events in native and exotic species trade between deer farms across Florida (2014-2020)

9:45 - Kisha Mulenga*, Bethune-Cookman University, Flood Mapping Using Optical Imagery with a Machine Learning Approach

Paper Session 1B (Room 3012) - 9:00 – 10:00 a.m
Climate and Hazards

9:00 - **David Keelings**, University of Florida, It's Getting Hot in Here: Spatial Impact of Humidity on Heat Wave Severity in the U.S.

9:15 - Kelly San Antonio, Bethune-Cookman University, Hurricanes and Barrier Island Resilience - Impacts from Recent Hurricanes and an Ongoing Solution to Strengthen Coastal Defense Structures

9:25 - Emma Silverman*, University of Florida, An Assessment of the Relative Drought Vulnerability of the Countries in South America

9:45 - Cori Matyas, University of Florida, Using space-based radar observations to compare mosaics created from multiple ground-based radars detecting the rainbands of tropical cyclones

Paper Session 1C (Room 3006) - 9:00 – 10:00 a.m
Critical Human Geography

9:00 - **Tyler McCreary**, Florida State University, Indifferent Doctors and Disrupted Kinship Connections: Settler Colonialism and Care for Indigenous Elders

9:15 - Wania Cardoso*, University of Florida, Indigenous Nations Under Siege: Comparing De Jure and De Facto Indigenous Rights in Ecuador and Brazil

9:25 - Rayne Hawkins*, Florida State University, Indigenous Technological Capacity Building: How to achieve ethical community-focused training endeavors that support traditional ecological knowledge

9:45 - **Cynthia Simmons**, University of Florida, Connecting Continents, Disrupting Lives: Unraveling the Impact of Infrastructure Development on Indigenous Peoples of the Ecuadorean Amazon

Break – 10:00 – 10:15 a.m.

Paper Session 2A (Room 3018) - 10:15 – 11:00 a.m.
Geo AI & GIScience

10:15 - Fiona Benzi*, Florida Atlantic University, UAS Photogrammetry for Mapping Vegetation Communities in Central Florida

10:30 - Ira Sheskin, University of Miami, Methods for Estimating the Jewish Population in Florida

10:45 -

Paper Session 2B (Room 3012) - 10:15 – 11:00 a.m.
Critical Human Geography

10:15 - **Alan Wiig**, University of Florida, Mitigation, adaptation, and everything in between: Assessing the landscape of climate urbanism in U.S cities

10:30 - Caitlin Jones*, Florida State University, Digging into the Gopher Tortoise Relocation Market: The Production of Uneven Conservation Geographies and Conditions of Uncertainty within Gopher Tortoise Relocation in Florida

10:45 - Adam Rose*, Florida State University, Predictive Policing in Miami-Dade County: A Quantitative Analysis

Paper Session 2C (Room 3006) - 10:15 – 11:00 a.m.
Human - Environment Relations in a Changing World

10:15 - David Russell*, University of Florida, A Spatial Social Network Approach to the Diffusion of Political Violence

10:30 - **Maria Fadiman**, Florida Atlantic University, Introduced exotics as rising stars of local economies and identities in the Canary Islands

10:45 - Aaron King*, University of Florida, Shared Landscape, Divergent Outcomes: Comparing Communal Conservancy Governance Participation in Kunene, Namibia

Poster Session 1 (3rd floor - Hallway) - 11:00 a.m. – 12:00 p.m.

1. Kevin Ash, University of Florida, Composite Red Tide Vulnerability Index (CRTVI): Assessing and Communicating Socio-Economic Vulnerability of Coastal Communities to Red Tide in Florida

2. Md. Shamsudduha Sami*, University of Florida, Evaluating the Spatio-Temporal Impact of Storm Surge Duration and Magnitude on Extreme Coastal Water Levels Across U.S. Coastlines

3. Caroline Huguenin*, University of Florida, Assessing extreme dry spells across the Tempisque-Bebedero River Basin, Costa Rica

4. Sara Bensalem*, University of Florida , Gang Nail Plates in Florida: Hurricane-Resilient Innovation and the IPAT Efficiency Paradox

5. Sabina Gyawali*, Florida Atlantic University, Pollen and Vegetation Trends across the Little Ice Age at Laguna Danta, Costa Rica

6. Risa Patarasuk, Alachua County BOCC, Septic Systems Heat Map of Alachua County, Florida

7. Jessica Striley*, University of Florida, 24 Years of Land Cover Change in Niassa's Miombo: Random Forest vs. Rule-Based Classification

8. Gavriella Hecht*, University of Florida, Spatiotemporal Analysis of Dengue Fever in Puerto Rico: Investigating Disease Patterns Amid Demographic Shifts (2013–2023)

9. Syarifah Ismailiyah Al Athas*, University of Florida/ Universitas Islam Indonesia, Bridging the Gap of GIS and BIM: Ensuring Information Accuracy Across Interoperability and Level of Development (LOD) Standards

10. Justin Grant*, Bethune-Cookman University, NASA DEAP Institute: A Three-University Consortium toward Improving Satellite Data-Based Coastal Flood Segmentation using Machine Learning

11. Simone Gionfriddo*, University of Florida, Mapping Environmental Injustices in Florida: An Initial Analysis of Superfund Sites and Demographic Data

12. Mason Theurer*, University of Florida, "Fracturing Ecological Frameworks": Fragmentation characteristics of sandhill and scrub habitats within the Florida Wildlife Corridor versus outside, between 1995, 2004, and the present

13. Briar Pierce*, University of Florida, Detecting Human and Environmental Changes in the Landscape Using Historical Maps and LiDAR Datasets

14. Jennie Paul*, Florida Atlantic University, Empathy Development and Long-Term Environmental Stewardship: Evaluating the Impact of Nature-Based Learning and Geoliteracy in Early Childhood

Lunch – (Room 1215) 12:00 – 1:00 p.m.

Paper Session 3A (Room 3018) - 1:00 – 1:45 p.m.
Critical Human Geography

1:00 - Michael O'Malley*, University of Florida, The Case for Capabilities: Shifting the Evaluative Lens from Resources to Lived Experiences

1:15 - Dani ONeill*, Florida State University, Exclusion and Inclusion in the Public Library: A Brief History of Censorship and Librarianship in the American Public Library

1:30 - **Emily Billo**, Florida State University, Extractivism and 'green' energy transitions: Social reproduction and embodied resistance to mining futures in Intag, Ecuador

Paper Session 3B (Room 3012) - 1:00 – 1:45 p.m.
Climate, Hazards, Medical Geography, and Global Health

1:00 - Jawata Afnan Saba*, University of Florida, A Monte Carlo Approach to Quantify and Analyze Uncertainty in a Social Vulnerability Index

1:15 - Airin Akter*, University of Florida, Comparative Analysis of IMERG and MSWEP Dataset in Capturing Tropical Cyclone Rainfall in the North Indian Ocean

1:30 - Ian Pshea-Smith*, University of Florida, Geographic trends of infectious and inflammatory eye diseases in Florida from 2014 to 2019

Break – 1:45 – 2:00 p.m.

Paper Session 4A (Room 3018) - 2:00 – 2:45 p.m.
Human - Environment Relations in a Changing World

2:00 - **Audrey Smith**, University of Florida, Balancing Rapid Urban Expansion and Sustainable Development: Insights from Addis Ababa, Ethiopia

2:15 - Ursula Nash, Why should we care about Gopher Tortoises?

2:30 - Kaitlyn Anderson*, University of Florida, Parks, Forests, and People: A History of America's Protected Lands

Paper Session 4B (Room 3012) - 2:00 – 2:45 p.m.
Climate, Hazards, Medical Geography, and Global Health

2:00 - **Natalia Dambe**, University of Florida, The Impact of Climate Extremes on Wind Power Development in the United States

2:15 - Debjani Das*, University of Florida, Unequal Foot-traffic: Human Mobility Patterns to Small and Large Businesses during the COVID-19 Pandemic

2:30 - Alec Colarusso*, University of South Florida, Estimating Flood Impact, Residence Times, and Recession Rates using an Integrated Camera Monitoring Network and Digital Twin

Poster Session 2 (3rd floor - Hallway) - 2:45 – 3:45 p.m.

1. Rory Caskey*, University of Tampa, Analyzing a Spatial Dry Spell Climatology for the Southeastern United States

2. Sanjeev Luintel*, Florida Atlantic University, An Initial Record of Long-term Environmental Change at a Northern Boreal Peatland, Maine, USA

3. Zainab Ali*, University of Florida, Review of Literature on Intercomparison Studies of Measurements Between GPM DPR and Ground-Based Radars

4. Michelle Ruiz*, University of Florida, In the Path of Destruction: Spatial Relationships Between Social Vulnerability and Property Losses After Hurricane Michael

5. Donal Bissainte*, University of Florida, Understanding Social Vulnerability through Hazard of Place Model: A Comprehensive Analysis of Floridian Communities

6. Sienna Silvest*, University of Florida, Anthropogenic Modifications of the Geomorphology in the Lower Savannah River and Harbor for the Improvement of Navigation

7. Savanah Kendrick*, University of Florida, Historical and Recent Trends in Sandbar Morphology Along the Upper Escambia River

8. Christopher Atta Amponsah*, University of South Florida, Machine Learning Applications Integrated with GIS for Flood Prediction

9. Joel Wixson*, University of Florida, Using Google Earth Engine to Detect Sandbar Change in the Lower Mississippi

10. Holli Capps Herron*, University of Florida, Spatiotemporal Variability in Baseflow Relative Contribution to Extreme Annual Streamflow, Florida: Exploration in Climate Division 1

11. Ava Johnson*, University of Florida, Mapping the Loammi Skipper

12. Michael Licea*, University of South Florida - St. Petersburg, Reimagining Vulnerability and Resilience at Neighborhood Level: Post Helene and Milton

13. Erin Mariotti*, University of Florida, Optimizing Solar-Powered EV Charging Infrastructure in Florida

14. Natalie Restrepo* and Anne Chin, Florida State University, Social Perceptions of the South Platte River: A Temporal Discourse Analysis of the Local Press

Banquet & Awards - Reitz Union 4th floor – Arredondo Room
7:00 – 9:30 p.m.   Banquet dinner
7:30 – 8:00 p.m.   Keynote speaker - Cynthia Barnett
8:15 – 8:45 p.m.   Awards presentation
8:45 – 9:00 p.m.   Closing remarks

Sunday, February 23rd
9:30 – 11:00 a.m.   Business Meeting (Turlington 3018)
Have a safe trip home!

Paper Abstracts

Airin Akter*, Corene Matyas
University of Florida

Comparative Analysis of IMERG and MSWEP Dataset in Capturing Tropical Cyclone Rainfall in the North Indian Ocean

This study evaluates the performance of two satellite-based rainfall datasets—Integrated Multi-satellite Retrievals for GPM (IMERG) V07 and Multi-Source Weighted-Ensemble Precipitation (MSWEP)—in capturing rainfall during tropical cyclones in the North Indian Ocean. The analysis focuses on differences in rainfall capturing over land, with a specific emphasis on landfalling tropical cyclones. Daily precipitation data for tropical cyclones from 2014 to 2020 were analyzed using GIS methods, including buffer and intersection techniques, to calculate volumetric rainfall over land. Results indicate that MSWEP captures a larger area of heavy rainfall, particularly for thresholds ranging from 62.5 mm to 125 mm, and exhibits a more consistent distribution of rainfall over land compared to IMERG. Additionally, MSWEP performs better in identifying extreme rainfall events. These findings align with existing research, emphasizing MSWEP's accuracy in capturing daily precipitation over land. This study highlights the importance of selecting appropriate datasets for accurately assessing cyclone-induced rainfall, particularly in vulnerable coastal regions.

Kaitlyn Anderson*
University of Florida

Parks, Forests, and People: A History of America's Protected Lands

The history of national parks and forests in the United States reflects a transformative journey in environmental conservation, balancing public access, resource management, and ecological preservation. The establishment of Yellowstone National Park in 1872 marked a global precedent, laying the foundation for the National Park Service (NPS) in 1916. Simultaneously, the U.S. Forest Service, created in 1905, began managing public lands for both conservation and sustainable resource use. Together, these agencies manage over 275 million acres of protected land, fostering biodiversity while supporting recreational and economic activities. The expansion of protected areas during the 20th century coincided with the rise of automobile travel, reshaping the accessibility and infrastructure of these landscapes. Roads, initially constructed to facilitate visitor access and resource management, became a pivotal feature of both national parks and forests. While these developments democratized access to protected areas, they also introduced significant ecological challenges. Roads fragmented habitats, disrupted ecological connectivity, and initiated long-term environmental impacts. Today, the history of road development within national parks and forests underscores the dual mandate of these systems: providing public enjoyment while ensuring the preservation of natural and cultural resources. This presentation explores the historical milestones of national parks and forests, emphasizing the interplay between conservation and infrastructure. It highlights the evolving strategies of the NPS and U.S. Forest Service in navigating these competing priorities and shaping the legacy of America's protected landscapes.

Fiona Benzi*, David Brodylo, Abdulla Al Fazari, and Caiyun Zhang
Department of Geosciences, Florida Atlantic University, Boca Raton, Florida

UAS Photogrammetry for Mapping Vegetation Communities in Central Florida

Inland wetlands have an inherent physical inaccessibility, which leads to problems when attempting to monitor them. Developing remote sensing techniques enables community analysis during periods when the environment is otherwise inaccessible. To aid in the data collection, UAS photogrammetry can ascertain centimeter-level orthoimagery of communities to capture intricate details. This project explored the potential of UAS photogrammetric products to develop object-based image analysis and machine-learning methods to classify five inland wetland communities identified within the study area, located in Central Florida. The results compare the reliability of UAS-derived products utilized for inland wetland community spatial analysis with lower-resolution sources. By increasing the accuracy, there is an improved potential to refine vegetation community management and restoration plans.

Emily Billo
Florida State University

Extractivism and 'green' energy transitions: Social reproduction and embodied resistance to mining futures in Intag, Ecuador

Intag, Ecuador is known for its 30-years long anti-mining movement, its success most recently evident in a 2023 legal victory that cancelled Chilean state mining company, CODELCO's, and Ecuadorian national company, ENAMI's, license to operate the Llurimagua concession. Yet, the march toward an open-pit copper mine in the region continues, as the surrounding concessions continue to be bought up by foreign companies. Building on scholarship focused on 'green' energy transitions in Latin America, and the ongoing socio-ecological and socio-territorial struggles of extractivism associated with these transitions, this paper examines how the anti-mining movement in Intag relies on women's socially reproductive labor. In the uncertainty generated by state and capital's incessant march toward exploiting Ecuador's 'copper-belt', and the delay produced by those who resist this extractive future, campesinas tell stories, including rumor and gossip, to express themselves in the shifting socio-ecological terrain of Intag. Often dismissed as a gendered, unproductive social activity, I demonstrate how gossip allows women to assert their place in Intag and Ecuador's potential energy transition. Drawing on literature within feminist economic geography, I situate women's stories as social infrastructure, or the socially reproductive labor that undergirds potential and ongoing socio-ecological transformations in the region. I argue that their stories illustrate how potential mining futures are embodied, carried through women's everyday lives. At times, these stories illustrate resistance to the material practices of exploitative relationships, while in other moments stories express emotions, such as vulnerability and fear, as women consider their socio-ecological futures.

Alec Colarusso*
University of South Florida

Estimating Flood Impact, Residence Times, and Recession Rates using an Integrated Camera Monitoring Network and Digital Twin

A localized application of a digital twin (i.e., virtual replica) was developed, replicating flooding processes from a major storm event, in a St. Petersburg, Florida neighborhood (~Old Southeast). Natural processes considered are infiltration and soil saturation estimated from Potential Evapotranspiration using available meteorological stations (WeatherStem and Ambient Weather Network) and Earth Observation data (MODIS constellation or equivalent). The processes were estimated algebraically and flood height, extent, and residence time was derived from a camera network around the study area. Storm drain (network) GIS data estimated the drainage capabilities of the network and the movement of excessive waters through the network and into the surrounding landscape. To estimate

the amount of water entering buildings, LiDAR data extracted building elevation data, estimating its first floor elevation (FFE). The extracted FFE was subtracted by the estimated water level height from the camera network to identify the height of the water entering these structures. The duration of the water's time within the house was estimated by determining how long the height of the water surpassed FFE height. This presentation aims to demonstrate how a digital twin combines different processes and data inputs to create a virtual replica of a flooding event, showing the event's impact on infrastructure, particularly regarding buildings and the storm drain network.

Natalia Dambe*, Johanna Engström
University of Florida

The Impact of Climate Extremes on Wind Power Development in the United States

Wind power has emerged as the leading component of the U.S. renewable energy landscape, providing approximately 10% of the nation's electricity as of 2022. While numerous factors influence its development, including policy, market conditions, and resource availability, the role of climate extremes, particularly drought, remains understudied. This research investigates the potential impact of drought on wind power siting, focusing on agricultural regions with limited water resources, where the installation of renewable energies may be seen as an alternative source of income.
We hypothesize that drought may indirectly influence wind power development by affecting land use, economic conditions, and regulatory decisions. By incorporating historical drought data into a comprehensive analysis of wind power development patterns, we identify significant correlations and causal relationships. This study contributes to a deeper understanding of the complex interplay between climate extremes (drought), energy policy, and sustainable development.

Debjani Das*, Liang Mao
University of Florida

Unequal Foot-traffic: Human Mobility Patterns to Small and Large Businesses during the COVID-19 Pandemic

The COVID-19 pandemic caused significant disruptions to human mobility across the U.S., with authorities implementing ""Stay-at-Home"" orders to limit movement. These restrictions led to dramatic shifts in mobility patterns, particularly in visits to points of interest (POIs) such as workplaces, shops, and recreational areas. While previous research has highlighted reductions in foot traffic to non-essential businesses, especially in high-income areas, most studies have focused on broad geographic scales like counties and states. In this study, we aim to provide a fine-grained, localized analysis by comparing visit disparities between small and large businesses at the Census Block Group (CBG) level, offering new insights into spatial variations in business visitations during the pandemic. We will develop a visit disparity index, calculated based on the reduction rate of visitors to small and large business POIs. This index will quantify the relative impact on each business type, with values other than 1 indicating a disparity. To analyze spatial patterns, we will use Getis-Ord Gi* for hotspot analysis to detect clusters of CBGs with significant high or low disparity index values. Additionally, we will apply Moran's I to assess spatial autocorrelation, determining whether disparities in one CBG correlate with those in neighboring CBGs, uncovering geographic patterns in mobility.

Maria Fadiman
Florida Atlantic University

Introduced exotics as rising stars of local economies and identities in the Canary Islands

The identity of place in relation to its plants remains fluid, often connected to an introduced species. In some instances, the place from

which the plant originates becomes blurred with the passage of time as communities adopt these species as their own. Additionally, economic gain and marketing can further solidify the role of a plant. People and plants have historically travelled between Latin America and Spain, most notably with the Columbian Exchange. While for the Spanish archipelago, the Canary Islands, human migration took a unique turn in that residents from the islands "Isleños" looked for work to gain economics status in Cuba and Venezuela, certain Latin American plants were making an economic impact in the Canary Islands. This paper looks at the historic and current role of Opuntia, often called "prickly pear", on the islands. We explore how this cactus became dominant in the commercial identity of Canary Islands residents, and then how external markets, ecological factors, and the adoption of even newer arrivals influence the changing role of this species in the landscape.

Imani Ford*, Hyun Jung, Kelly San Antonio
Bethune Cookman University

Assessment of Urban Stormwater Systems for Improved Urban Habitat and Estuarine Ecosystem Management

Urbanization has increased untreated stormwater discharge into coastal water bodies, impacting ecosystems. This study examines the urban watershed of the Halifax River, an impaired estuarine lagoon on Florida's East Coast. Despite its impaired status, limited water quality monitoring exists for stormwater canals feeding into the estuary. The study aims to understand the water quality of urban stormwater systems, the Halifax River, and its surrounding community. Spatial and temporal trends in Halifax River water quality were analyzed using data from the St. Johns River Water Management District. In-situ monitoring of stormwater canals was conducted bi-weekly for five months in 2024 at seven locations. GIS maps of five municipalities in the drainage area were developed using flood zones, census data, and critical infrastructure. According to the results, the Halifax River's TKN-T has significantly decreased over the last ten years. However, the only nutrient parameter regularly measured during this time is TKN-T, which emphasizes the necessity of more extensive nutrient monitoring. The river's salinity and turbidity did not exhibit discernible long-term changes. Although stormwater quality typically varies within the range of estuarine water quality, periodic nitrogen spikes at monitoring locations suggest localized problems that need to be addressed specifically. Furthermore, South Daytona is most vulnerable to a Category 4 hurricane storm surge, which emphasizes the necessity of mitigation measures to safeguard educational institutions. The significance of localized management and improved monitoring in addressing water quality and community vulnerability is emphasized by this study.

Rayne Hawkins*
Florida State University

Indigenous Technological Capacity Building: How to achieve ethical community-focused training endeavors that support traditional ecological knowledge

In this paper, I use counter-mapping as a methodology to highlight the value of Indigenous knowledge, drawing on geovisualization methods to build Wet'suwet'en technological capacity to expose and contest settler geographies. The Canadian province of British Columbia (BC) comprises nearly nine hundred and forty five thousand square kilometers, 95% of which remains unceded with no formal treaty agreements with the over 214 Indigenous nations in BC. A century has passed since the Indigenous nation of the Wet'suwet'en were removed from their territories to reserve allocations and nearly 50 years since negotiations began for a contemporary treaty. However, there are no agreements that cede authority to the Canadian government over Wet'suwet'en territory. Resource governance in Indigenous communities is impacted by the dichotomy between Western power and Indigenous knowledge. I will discuss my experience as a unmanned aircraft systems (UAS) trainer

with a Wet'suwet'en field technician team and how my insight can impact future trainers' ability to understand the gap in technological capacity and literacy between provincial government agencies and First Nations. This paper speaks to the current political geographies of First Nations communities in a time where extractive industries threaten reciprocal land relationships that are the basis for Wet'suwet'en hereditary governance system. Interviews and field notes revealed that a centralization of Wet'suwet'en community values, a focus on increasing sustainable capacity, and a priority of balancing knowledge transference between First Nations and researchers are necessary to incorporate in successful technological training endeavors.

Caitlin Jones*
Florida State University

Digging into the Gopher Tortoise Relocation Market: The Production of Uneven Conservation Geographies and Conditions of Uncertainty within Gopher Tortoise Relocation in Florida

Market-based strategies in species conservation often have spatially differing effects on both animals and habitat, working to produce uneven conservation geographies. This effect is evident in gopher tortoise (Gopherus polyphemus) conservation in Florida. Gopher tortoises are a state listed species constantly in competition with human development, necessitating the Florida Fish and Wildlife to implement a species translocation mitigation program that requires developers to humanely relocate tortoises to state permitted recipient sites. Much like gopher tortoises dig into sandy soils to create burrows, this paper takes two digs into the gopher tortoise relocation market to unearth the ways relocation policy and activities produce uneven conservation geographies in Florida. Drawing on semi-structured interviews, document analysis, and personal observations and engagement, this paper looks to untangle the market logics in relocation and its effects as a conservation strategy. My first dig into

the political economy of relocation examines the production of uneven conservation, examining how tortoises move through the relocation market, where conservation takes place at local and state levels, and how private property becomes enrolled. My second dig uncovers the ways the reliance on private property in relocation creates issues of access for scientists trying to better understand the effects of relocation on tortoises. This suggests a neoliberal market approach does not merely lead to the uneven conservation of species life and habitat but it produces the conditions to make its effects unknown and difficult to access, creating problems for conservation governance.

David Keellings
University of Florida

It's Getting Hot in Here: Spatial Impact of Humidity on Heat Wave Severity in the U.S.

Heat waves pose significant risks to society, impacting human health, infrastructure, and the environment. However, on humid days, heat waves become more dangerous by raising the apparent temperature, or the temperature perceived by the human body. This study introduces an enhancement to the existing Heat Severity and Coverage Index (HSCI) that incorporates humidity (HSCIH) to provide a more robust assessment of heat wave severity relative to the human body. Our findings show that from 1980 to 2022, trends in humid heat severity have increased in every climate region of the Conterminous United States, while temperature-based heat severity shows variable rates of increase or decrease. Regional analysis shows that humid regions, particularly in the Eastern U.S., exhibit stronger upward trends in humid heat wave severity. Further, the

incorporation of humidity into heat severity assessments significantly alters the ranking of historical heat wave events. Many heat waves that were previously ranked as moderate in severity are now recognized as more severe when humidity is considered. These results highlight the critical role of humidity in understanding the impact of extreme heat on human health and stress the need for comprehensive heat assessment metrics.

Aaron King*
University of Florida

Shared Landscape, Divergent Outcomes: Comparing Communal Conservancy Governance Participation in Kunene, Namibia

Community-based natural resource management (CBNRM) programs rely on robust participatory governance to accomplish their ecological, economic, and social goals. However, participation varies significantly within and among communities, even in shared ecological landscapes. This study examines spatial variation in governance participation across three communal conservancies in Kunene, Namibia: Ehi-Rovipuka, =/=Khoadi-//Hôas, and Doro !nawas. Using an original Participation in Governance Index (PGI) derived from household-level survey data, we explore spatial patterns in participation and their determinants. Spatial interpolation techniques (IDW and ordinary kriging) reveal localized patterns of governance participation, influenced by proximity to conservancy offices and primary roads. A spatial lag model identifies associational membership, representative fairness, gender, and benefits as the strongest predictors of PGI, with notable conservancy-level differences demonstrated though cluster analysis of the model coefficients.

These findings provide strong evidence that community participation in CBNRM governance is driven by distinct conservancy-level factors. Governance participation is shaped not only by individual socio-demographic factors but also by localized institutional practices and spatial inequities in access. Despite their shared landscape and ecological challenges, the study conservancies exhibit idiosyncratic dynamics, emphasizing the need for flexible and decentralized governance frameworks. The importance of small-scale factors that may differ from community to community even within a single conservancy is consistent with calls from scholars such as Ostrom and Murphree to deepen democratic participation and inclusivity through more complete devolution of CBNRM governance functions.

Corene J. Matyas, Stephanie E. Zick, Kimberly M. Wood
University of Florida, Virginia Tech, University of Arizona

Using space-based radar observations to compare mosaics created from multiple ground-based radars detecting the rainbands of tropical cyclones

With varying tangential winds and combinations of stratiform and convective clouds, tropical cyclones (TCs) can be difficult to accurately portray when mosaicking data from ground-based radars. This study utilizes the Dual-Frequency Precipitation Radar (DPR) from the Global Precipitation Measurement Mission (GPM) satellite to evaluate reflectivity obtained through four sampling methods of Weather Surveillance Radar 1988-Doppler data including ground radars (GR) in the GPM ground validation network, and three mosaics including the Multi-Radar/Multi-Sensor System (MRMS) plus two we create by retaining the maximum value in each grid cell (MAX) and using a distance-weighted function (DW). We analyze Hurricane Laura (2020) with a strong gradient in tangential winds and Tropical Storm Isaias (2020) where more stratiform precipitation was present. Differences between DPR and GR reflectivity were larger compared to previous studies that did not focus on TCs. Retaining the maximum value produced higher values than other sampling methods, and these values were closest to DPR. However, MAX values were too high when DPR time offsets were greater than 120 seconds between the scans of neighboring radars. The DW and MRMS mosaics produced similar values to one another but lower

compared to DPR and MAX. Finally, stratiform observations yielded smaller differences than convective observations. Future work should analyze additional TCs to further explore the impact of scanning offsets and precipitation type when creating a mosaic."

Tyler McCreary, Rebecca Hall
Florida State University

Indifferent Doctors and Disrupted Kinship Connections: Settler Colonialism and Care for Indigenous Elders

This paper examines how settler-colonial psychiatry approached geriatric care for Indigenous elders in mid-twentieth century British Columbia, Canada. Doing so, it bridges literatures on the geographies of settler colonialism and the space of the asylum. The paper centers on a critical examination of the story of one patient, who was confined to bed in an overcrowded asylum, 725 miles south of his home community, where he remained without visitors for nine months until his death. Through focusing on this microscale story, we show the intimate ways that colonial power operates on particular individuals, highlighting the connection between personal and family histories, on the one hand, and the systems and structures of settler society, on the other. We argue that the treatment this patient received is a hallmark of the settler medical orientation to Indigenous peoples in the period. His involuntary confinement, while tragic, was not a mistake. The psychiatric hospital was designed as a space of indifference, where settler authority over life and death would be enacted without regard for Indigenous experience. This had callous consequences for Indigenous patients and their communities. Those under psychiatric care suffered a slow erosion of their sense of self; simultaneously, the displacement of Indigenous elders to distant psychiatric wards ruptured the networks of kinship that grounded the transmission of intergenerational knowledge and lifeways. This indifference was a strategic colonial orientation, one that obfuscated other Indigenous ways of relating to kin and care.

Morgan Metrailer*, Jeremy P. Orange, Samuel Canfield, Yujie Hu, Samantha M. Wisely, Jason K. Blackburn
University of Florida

Identifying dominant trade distributors and potential co-mingling events in native and exotic species trade between deer farms across Florida (2014-2020)

Florida's deer farm industry includes more than 400 deer farms statewide. In 2014, the Cervidae Health Research Initiative (CHeRI) was formed to work in collaboration with Florida deer farmers to promote sustainable and safe management practices. White-tailed deer (WTD) are a dominant, native game species in Florida and deemed one of the most economically important species in the state. The translocation of exotic or native wildlife through trade can expose naïve populations to different circulating environmental pathogens or introduce carried pathogens into new locations. The objectives of this study were to 1) identify the differences in native and exotic captive ruminant trade networks, 2) determine regional clustering of the trade network, and 3) investigate co-mingling of species within trade movements. Network analyses identified major distributors (hubs), changes in exotic trade networks, and potential species co-mingling events. We found dominant distributors were conserved in the general species trade and the exclusively exotic-involved trade networks. Alternatively, one of the large distributors

was reduced in the exotic network, suggesting minimal or no exotic trade. Statewide and regional patterns were detected across different sub networks - discovering central distributors that are vital in safe translocation practices and disease mitigation efforts. The species co-occurrence network identified co-mingling events between native and exotic species occurs frequently and in high quantities with specific species – suggesting future targeted studies to determine the impact of their interactions with native WTD and if that affects disease incidence.

Kisha Mulenga*, Andrew Molthan, Ronan Lucey, Alexander Melancon, Kelly M. San Antonio, Hyun J. Cho, Juan Calderon
Bethune-Cookman University, NASA OSTEM Internship

Flood Mapping Using Optical Imagery with a Machine Learning Approach

This NASA OSTEM internship project demonstrates a comprehensive approach to flood mapping in Rio Pardo, Brazil, using high-resolution PlanetScope optical imagery (3 meters) and a random forest classifier. The NASA OSTEM internship project aimed to detect and analyze flood extents by leveraging PlanetScope's four spectral bands (red, green, blue, near-infrared) to differentiate land cover classes with minimal cloud cover. Training datasets were generated in QGIS to classify water, urban, vegetated, and bare soil. Classification accuracy was refined using a stratified random sampling method that accounted for diverse land covers, ensuring water and non-water classes were adequately represented. The random forest algorithm integrated multiple ML decision trees, resulting in robust predictions with high overall accuracy. Despite these positive outcomes, shadows in urban and vegetated regions led to occasional misclassifications, and wet soils sometimes appeared as water. Nonetheless, the PlanetScope imagery effectively captured subtle spatial details crucial for identifying flooded areas. This method highlights the potential of machine learning to provide timely, reliable flood mapping for disaster response and

infrastructure planning. By combining advanced satellite data with open-source software, the project results emphasize how finer spatial resolution, minimal cloud interference, and classification methods can yield dependable results. Results validated via ground truthing and user accuracy metrics further confirm this methodology's viability of use for operational coastal flood management and policy decisions.

Ursula Nash
FSG

Why should we care about Gopher Tortoises?

Are Gopher Tortoises a significant member of our society and environment? These are all questions that relate to where they are and where they have been displaced in peninsular Florida. As more land is developed in SW Florida and for Solar Farm development, gopher tortoises are being removed. Though USFWS did not list the Florida population of Gopher Tortoises as a threatened or endangered species, they are still State listed. Are developers saving the species by displacing them?

Dani ONeill*
Florida State University

Exclusion and Inclusion in the Public Library: A Brief History of Censorship and Librarianship in the American Public Library

Censorship of books in the United States has become a divisive political topic within the past four years, with Florida at the forefront of the conversation. While school libraries have been the focus of censorship debates, the practice extends into the space of public libraries. Indeed, when examining the history of the American public library, it is clear the public library would not exist without practices of censorship. As a state institution, the public library is enrolled in multiple purposes, providing local public space capable of producing

socio-political change, yet also sustaining power by means of exclusion and social policing. Geographers and library historians alike have established that the public library is an institution central to cultural and educational state practices, yet little work has been done to examine how the institution is sustained and reproduced in the everyday. Drawing on feminist geographic literature, in this paper I describe a brief history of the American public library's relationship to censorship, and how this relationship has informed librarianship. I argue that the public library is an institution enrolled in social reproduction, dependent on the labor of women to fulfill its many purposes. Such purposes can work against one another, leaving library workers in a space of precarity.

Ian Pshea-Smith*, Ethan Werner, Matthew R. Dunn, Ramona Bashshur
 University of Florida, University of Michigan, University of North Carolina, Eversight Vision

Geographic trends of infectious and inflammatory eye diseases in Florida from 2014 to 2019, Ian A. Pshea-Smith, University of Florida, Gainesville, Florida, Department of Geography, Emerging Pathogens Institute, One Health Center of Excellence

Infectious and inflammatory eye diseases are of global concern due to their diverse causes and potential severity. Within the United States, recent reports display an upward trend in keratitis diagnoses and of other related ophthalmic diseases, however further work is required to understand local and regional patterns of infectious and inflammatory eye diseases, particularly across different states as public health policy and medical access differs. Understanding epidemiological and spatial trends of these diseases are therefore important, as elucidating these patterns can provide important insights for disease prevention, resource allocation and baselines for future studies. In this work, we map and describe spatial dynamics of infectious and inflammatory eye diseases within Florida, using data from the Vision and Eye Health Surveillance System of the US Centers for Disease Control and Prevention. Using this data, we also describe spatial clustering of these reported diseases, and describe sociodemographic patterns using available data in the Vision and Eye Health Surveillance System database, in addition to county level associations using data from the US census and the American Community Survey. The geographic patterns may inform policy decision-making, however further work is indicated to elucidate additional drivers of these spatial patterns and associations.

Adam Rose*
Florida State University

Predictive Policing in Miami-Dade County: A Quantitative Analysis

Miami-Dade County Police Department utilizes predictive models to improve policing outcomes In 2015, Miami-Dade County changed from using the non-spatial software COMPSTAT, software that collects and classifies crime data, to using HunchLab, a spatial software that predicts the amount of crime in an area based on past crimes. This transition allowed law enforcement officers to target neighborhoods suspected of criminal activity instead of individuals already known to the police. This study will quantitatively examine the effect the change in software from COMPSTAT to HunchLab had on the location and demographic factors of those arrested. The expected result is that policing became more intense and directed at a few neighborhoods under the HunchLab regime.

David Russell*
University of Florida

A Spatial Social Network Approach to the Diffusion of Political Violence

How and why do violent conflicts spread spatially? Political geographers and political scientists alike have long sought to answer this question given its far-reaching implications for both real-world policy decisions and theories of political violence. Existing research, however, often focuses at the level of the state and does not consider what drives individual conflict actors to operate in new territories. Likewise, this line of research rarely seeks to distinguish between discreet conflicts based on just who is doing the fighting in which places. This project, in line with a new wave of research, uses spatially disaggregated event data to analyze the spatialized social networks of conflict actors and to categorize a typology of conflict diffusion. I conclude by applying this novel methodology to the case study of Libya's costly and ongoing civil wars.

Jawata Afnan Saba*, Kevin Ash
University of Florida

A Monte Carlo Approach to Quantify and Analyze Uncertainty in a Social Vulnerability Index

Social vulnerability is a complex and dynamic concept. Social vulnerability indices represent a heuristic tool to identify places where several socioeconomic factors coincide to exacerbate disaster risks. Since 2006, these indices have been largely based on American Community Survey (ACS) data collected on a rolling basis by the United States Census Bureau. The ACS data, generated from smaller sample sizes than the decennial census, have a high margin of error (MoE). No study to date has addressed this problem to understand how uncertainty propagates into vulnerability rankings and maps. This study demonstrates a method to quantify the uncertainty of the census-based social vulnerability index. A widely used index in the U.S. is the Social Vulnerability Index, developed by the Centers for Disease Control (known as the CDC SVI). Using the 2020 version of SVI, we developed a Monte Carlo model using RStudio at the census tract level for FEMA Region-4 that uses the MoEs from the ACS data for each of the 16 indicators to generate four themes and the overall

SVI accompanying the MoEs. The generation of SVI MoEs enables further analysis using coefficients of variation to map uncertainty in the SVI. It allows for entropy calculation of the rankings of the census tracts across the Monte Carlo simulations, which can also be analyzed to identify regions where compounded uncertainties may undermine the usefulness of the index as a decision-making tool. This study facilitates a better decision-making tool in all phases of disaster management and public health.

Kelly San Antonio, Daniel Burow, Matthew J. McCarthy, Hyun J. Cho, Stephen C. Medeiros, Siddharth Parida, Yao Zhao, Hannah Herrerro
Bethune-Cookman University, Embry-Riddle Aeronautical University, Oak Ridge National Laboratory, University of Tennessee

Hurricanes and Barrier Island Resilience - Impacts from Recent Hurricanes and an Ongoing Solution to Strengthen Coastal Defense Structures

Hurricanes are destructive natural forces that leave lasting impacts on barrier island systems and their coastal communities. Intensifying climate change shortens dune recovery periods due to more frequent and intense storms, amplifying their impact on coasts and necessitating adaptive solutions to mitigate erosion. The research team used high-resolution satellite and LiDAR elevation data to study the impacts of the 2022 Hurricanes Ian and Nicole on natural and armored dune systems along Florida's Central East Coast. While both types of dunes were impacted by the hurricanes, our research results suggest armored shorelines suffered more erosion and as well as slower recovery after the hurricanes. The team now explores co-designing a more nature-based dune restoration called a living seawall in partnership with community stakeholders through an NSF CIVIC Challenge project. The living seawall project aims to highlight nature-based solutions that combines the benefits of natural and man-made infrastructure through a series of workshops geared to

collect community input and identify coastal needs. If selected for the pilot phase, the workshop input will be used to develop a living seawall and implemented on a vulnerable shoreline to provide better environmental resilience and resistance to extreme weather events. These research and workshop outcomes can identify gaps in coastline resiliency and community needs, which may be useful in informing adaptive solutions.

Ira Sheskin, Joshua Comenetz
University of Miami, Independent Researcher

Methods for Estimating the Jewish Population in Florida, Ira M. Sheskin, University of Miami

Because of the separation of church and state, the US Census does not ask questions about religion. In addition, most surveys completed by commercial firms or universities that do ask religion questions will omit the 27% of Jews who do not answer the religion question as "Jewish" but who do consider themselves Jewish in a cultural or ethnic sense (Jews of No Religion).

This paper presents a "DJN-Guided Methodology" for estimating the Jewish population of Florida, all 67 Florida counties, and all 28 Florida Congressional Districts. This methodology combines scientific studies of the Jewish population with the use of counts of Distinctive Jewish Names in a national household directory, US census data, general surveys that ask a religion question, data on synagogue location, Google Earth images, and the geographic location of each county.

The study shows that about 750,000 Jews live in the state with another 75,000 in seasonal residence (snowbirds). Almost-two thirds of the 750,000 and 73% of the seasonal residents live in Southeast Florida (Miami-Dade, Broward, and Palm Beach Counties). Palm Beach County (with 218,000 full-year Jews and 45,000 seasonal

Jewish residents) has the highest Jewish population. Jews form a minor part of the electorate in all but 6 Congressional Districts [23 (14.5%); 22 (14.0%); 24 (10.4%); 25 (8.8%); 21 (6.3%), and 20 (5.3%).

Emma Silverman*, Johanna Engström
University of Florida

An Assessment of the Relative Drought Vulnerability of the Countries in South America

South America is a continent of extremes. It's the wettest continent on Earth, but also home to one of the driest places on the Earth: the Atacama desert. In societies developed in and around ample water resources, there is an inherent vulnerability and sometimes also ignorance related to drought. The economies of South America greatly rely on ample water resources to naturally irrigate the expansive agricultural sector and provide hydroelectric power. Here the relative vulnerability of the South American nations is presented and the reasons for their vulnerability (or lack thereof) analyzed, considering exposure, sensitivity and adaptive capacity.

Cynthia Simmons, Michael Waylen, Aghane Antunes, Wania Cardoso, Morgan Manning, Carlos Urgiles, Miguel Acevedo, Joel Correia, Michael Esbach, Robert Walker
University of Florida, US Forest Service, University of Florida, University of Florida, University of Florida, Colorado State University, University of Florida, Colorado State University, Colorado State University, University of Florida

Connecting Continents, Disrupting Lives: Unraveling the Impact of Infrastructure Development on Indigenous Peoples of the Ecuadorean Amazon, Connecting Continents, Disrupting Lives: Unraveling the Impact of Infrastructure Development on Indigenous Peoples of the Ecuadorean Amazon

The significance of Amazonia to the global environment lies in its rich biodiversity and vast carbon reservoirs. Over the decades since the mid-20th century, countries within the Amazon basin, notably Brazil, Ecuador, Perú, and Bolivia, have initiated various infrastructure projects to exploit its resources and facilitate human settlement. Consequently, extensive swathes of the forest have been cleared for agricultural purposes, while urban centers within the basin have burgeoned, accommodating a population surpassing 20 million people. This developmental trajectory has unmistakably altered the region's ecological landscape and imperiled the cultural heritage of its Indigenous inhabitants. Despite prevailing threats, many Indigenous communities have demonstrated resilience, safeguarding their traditions and ancestral territories. However, recent years have witnessed heightened development pressures, spurred by a collective infrastructure initiative among South American nations. This endeavor seeks to transform the Amazon into a pivotal transportation nexus, a primary source of hydropower, and a favored destination for industrial ventures. This paper scrutinizes the potential ramifications of ongoing and proposed infrastructure projects and resource extraction activities on the ancestral lands of the Seikopai, Siona, and Cofán nations in the Ecuadorian Amazon. Its objective is to furnish these communities with pertinent insights, enabling them to anticipate forthcoming threats and strategize accordingly.

Audrey Smith*, M. Mehedy Hassan, Jane Southworth
University of Florida, Stanford University, University of Florida

Balancing Rapid Urban Expansion and Sustainable Development: Insights from Addis Ababa, Ethiopia

By 2050, two-thirds of the global population is projected to live in urban areas, with much of this growth occurring in low- and middle-income countries of the Global South. In Sub-Saharan Africa, rapid population growth and intensified rural-to-urban migration are expected to result in 50% of the population residing in urban areas by 2030. Much of this urban growth is unplanned, leading to low-density sprawl, environmental degradation, and challenges to achieving Sustainable Development Goals (SDGs). Rapid urban expansion often drives the conversion of forests, rangelands, and farmlands into urban infrastructure, impacting natural resoues, ecosystem services, and human wellbeing. Ethiopia, a biodiversity and geopolitical hotspot, exemplifies these challenges. Addis Ababa, the nation's capital, has undergone rapid urban growth in recent decades to accommodate population increases, industrial activities, and commercial expansion. However, the spatial patterns and socio-ecological impacts of this expansion remain poorly understood. This study integrates remote sensing data, landscape metrics, and socioeconomic indicators to analyze the rapid urban expansion of Addis Ababa from 1990 to 2022. Land cover changes are quantified using Landsat time series data, while spatial patterns of urban expansion are assessed through landscape metrics calculated with FRAGSTATS. The findings provide valuable insights into the complexities of urbanization and offer guidance for sustainable urban development in Ethiopia and the broader region.

Alan Wiig, Tony Nikolovski
University of Florida, Department of Geography

Mitigation, adaptation, and everything in between: Assessing the landscape of climate urbanism in U.S cities,

In order to stay competitive in a turbulent global economy, cities across the United States have developed strategies for addressing climate change. From sea level rise and flooding in coastal cities, to droughts and extreme heat in the interior, small, medium, and large cities nationwide aim to make the most of their locational advantage amidst growing climatological change. This study analyzes the climate resilience and adaptation projects of the 52 American cities listed in the GaWC classification for global cities. Findings are summarized for 14 cities across California, Florida, and Texas, three of the largest states by population and economy. While all cities are unique, a common trend was each's effort in community-based

projects like tree planting and solar-paneled roofs. Another finding was that most larger-scale infrastructure projects prioritized coastal cities like Los Angeles, Miami, and Houston over inland ones like Sacramento, Orlando, and Dallas. This research aims to capture the current landscape of climate resiliency in major US cities and reveals what projects have been done, what is currently in the works, and what are the future plans as cities attempt to address climate, economic, and geopolitical disruption simultaneously."

Poster Abstracts

Syarifah Ismailiyah Al Athas*
University of Florida / Universitas Islam Indonesia

Bridging the Gap of GIS and BIM: Ensuring Information Accuracy Across Interoperability and Level of Development (LOD) Standards

The interoperability between Geographical Information Systems (GIS) and Building Information Modelling (BIM) is critical in advancing digital design, construction, and geospatial analysis. However, challenges persist in ensuring that data transfers between GIS and BIM maintain consistent levels of detail and accuracy, particularly at defined Levels of Development (LOD), such as in LOD 200. This research outlines the roadmap for analyzing and addressing GIS-BIM interoperability challenges while ensuring consistent Levels of Development. Even further, this research aims to document the gaps in data workflows from GIS to BIM and vice versa while proposing a systematic approach to maintaining information accuracy at a stable LOD. Using a combination of literature review, software interoperability tests with image classification, and GIS-based spatial analysis, this study develops a framework for seamless data exchange. The finding is an interoperability chart to improve integration practices in urban planning and infrastructure development.

Zainab Ali*
University of Florida

Review of Literature on Intercomparison Studies of Measurements Between GPM DPR and Ground-Based Radars

Accurate precipitation measurement is essential for hydrometeorological research, forecasting, and disaster management. The Global Precipitation Measurement (GPM) Mission's Dual-frequency Precipitation Radar (DPR) has transformed global precipitation monitoring since its launch in 2014, offering detailed, three-dimensional observations of rainfall and snowfall. Despite its advancements, the integration of satellite- and ground-based radar systems is critical for addressing biases and enhancing the accuracy of quantitative precipitation estimates (QPEs). This study systematically reviews and analyzes 30 intercomparison studies conducted between 2014 and 2024, focusing on comparisons between the GPM DPR and ground-based radars. A meta-analysis evaluates the geographical distribution of studies, the precipitation types (e.g., stratiform, convective, and snowfall) investigated, the match-up methodologies (e.g., pixel-based, volume-matching), and statistical comparison metrics (e.g., continuous, categorical) used to compare the two radar systems. The findings offer insights into the current state of DPR and ground radar intercomparison research, identifying gaps, such as limited research of non-liquid precipitation types like snow and hail and insufficient evaluation of extreme precipitation events such as atmospheric rivers and tropical cyclones. This study offers a roadmap for future research based on the findings of current literature and the identification of major gaps.

Kevin Ash, Christa D. Court, Sandra Anderson, Kara Coffey, Roberto F. Koeneke, Lisa Krimsky, Mengming Li, Angie Lindsey, Kelsey McDaid, Claire Mitchell, Xiaohui Qi, Andrew Ropicki, Jawata A. Saba- Ricky Telg
University of Florida, University of Florida, University of Florida, Texas A&M University–Corpus, University of Florida, University of Florida

Composite Red Tide Vulnerability Index (CRTVI): Assessing and Communicating Socio-Economic Vulnerability of Coastal Communities to Red Tide in Florida

Harmful Algal Blooms (HABs) caused by Karenia brevis, or red tide, are a recurring phenomenon along Florida's coastlines, significantly affecting human health, tourism, fisheries, and local economies. While the impacts of individual red tide events have been documented, few studies have attempted to generalize beyond case studies to assess long-term socio-economic vulnerability for all of Florida's coastal regions. This study addresses this gap by creating a Composite Red Tide Vulnerability Index (CRTVI) to estimate the socio-economic vulnerability of Florida's coastal communities to red tide events. CRTVI incorporates indicators across five domains: human health, tourism, fisheries and marine activities, socio-economic vulnerability, and red tide exposure. Through literature reviews and focus groups, relevant metrics were selected, a weighting scheme was developed within and between the domains, and a composite indicator approach was used to construct the CRTVI. Data were collected for each domain and vulnerability was assessed at the county level. The results were presented in an interactive web platform, designed for policymakers, stakeholders, and the public, offering detailed data visualizations and usability-tested to meet user needs. The CRTVI provides a systematic, comparable framework for understanding socio-economic vulnerability to red tide events across Florida. It can significantly enhance decision-making related to red tide preparedness, mitigation, and response, offering valuable insights for reducing negative impacts on human health, local economies, and tourism. This index, alongside the web platform, supports ongoing efforts at regional, state, and national levels to manage and mitigate the effects of red tide, ultimately promoting more resilient coastal communities.

Christopher Atta Amponsah*
University of South Florida

Machine Learning Applications Integrated with GIS for Flood Prediction

In an era where climate change has added flooding problems to already existing challenges, technology contributes to finding proper preventive and adaptative strategies against floods. Artificial Intelligence (AI), particularly Machine Learning (ML), has progressed remarkably as a key instrument to develop real-world applications in recent years, particularly drawing on Geographic Information Systems (GIS) to predict floods. This technique has an underlying assembly of models that perform differently in terms of the theory behind its prediction, sensitivity, and suitability, which depends on the type of flood, including fluvial, pluvial, tidal, coastal, or compound. Interestingly, these models have been evolving in theory and accuracy, accompanied by several challenges even as data becomes more abundant. This poster aims to present an overview of how ML applications integrate with GIS for flood prediction. To achieve this aim, it highlights i) the evolution of the theoretical framework of ML models, sensitivity, and suitability in different flood scenarios. ii) the strengths and weaknesses of traditional and modern ML models, and iii) opportunities for future applications of ML in flood prediction. The analysis draws on a comprehensive review of journals and databases such as the Web of Science, Advances in Water Resources, Journal of Hydrology, and other resources, to highlight the limitations, key trends, and advancements in ML techniques since 1990.

Sara Bensalem*
University of Florida, School of Architecture

Gang Nail Plates in Florida: Hurricane-Resilient Innovation and the IPAT Efficiency Paradox

In 1955, engineer John "Cal" Jureit invented and patented the Gang-Nail connector, the first metal punch-tooth connector plate for wood trusses that did not require supplemental nail fastening. Originally created to reinforce roofs against hurricane-force winds in Florida, the innovation greatly reduced labor, materials, and costs. Factory-built truss systems became simpler and more consistent, enhancing both structural reliability and construction efficiency. The widespread adoption of this technology, however, illustrates a dual effect under the IPAT framework (Impact = Population × Affluence × Technology). Although the connector minimized resource use per unit of construction, it also enabled larger homes by lowering cost barriers and boosting overall affluence. As suburban development accelerated, total resource consumption grew, offsetting early gains in efficiency. This paradox underscores the importance of holistic strategies that preserve engineering advances while curtailing unintended expansions in affluence and environmental impact.

Donal Bissainte*
University of Florida

Understanding Social Vulnerability through Hazard of Place Model: A Comprehensive Analysis of Floridian Communities

South Florida faces increased vulnerability to natural hazards due to its geographic and demographic characteristics. This region encompasses 21 counties from Miami to Polk, Hillsborough, and Indian River. It is home to diverse communities, including socially vulnerable populations that are disproportionately impacted by climate change. Coastal areas and urban centers, alongside environmentally sensitive landscapes like the Everglades, are exposed to multiple hazards, such as hurricanes, floods, heat waves, and wildfires. Over the past few years, the region has seen a marked increase in the frequency and severity of climate-related disasters, including Hurricane Ian, which caused extensive damage to communities in 2022. This project aims to assess the risks associated with natural hazards in South Florida. We used data from FEMA's National Risk Index and the CDC/ATSDR Social Vulnerability Index (SVI). Our analysis provides a holistic understanding of the region's risk profile by integrating metrics of hazard frequency, intensity, and socioeconomic vulnerabilities. Multi-hazard scores and vulnerability indices are mapped across census tracts to identify high-risk areas and communities most in need of mitigation efforts. Our findings underscore the necessity for targeted disaster management strategies to build resilience in vulnerable communities. There is a critical need for policymakers to prioritize risk reduction in South Florida. They should focus on equitable interventions that address both environmental threats and social disparities. By combining spatial and socioeconomic data, this study offers insights to guide regional planning and policy development, helping to mitigate the impacts of future natural disasters.

Holli Capps Herron*, Katherine A. Serafin
University of Florida, Department of Geography

Spatiotemporal Variability in Baseflow Relative Contribution to Extreme Annual Streamflow Florida: Exploration in Climate Division 1

Florida's multitude of rivers means many communities are susceptible to extreme hydrological events, which are generated by a combination of runoff and baseflow. At the same time, baseflow is vitally important to the state of Florida because it provides a significant portion of drinking water supply and is the primary source of freshwater during dry periods. There are a number of methods for computing baseflow of a river, however, given limitations of the baseflow separation methods due to slope of Florida's land, reverse flows, etc. there has not been much research on baseflow estimation in the state outside of a few entities such as the water management districts. This research aims to investigate how baseflow contributes to extreme streamflow events and how that contribution varies based on baseflow separation technique across the state of Florida. Baseflow estimates are determined for U.S. Geological Survey (USGS) streamflow gages with near complete records beginning in 1950 using eight baseflow separation techniques from the USGS Hydrologic Toolbox. Next, an Annual Maxima streamflow series is generated for each gage. The relative contribution of baseflow and

runoff to annual maximum streamflow is then calculated. Using this a combination of statistical tests such as pearson correlations and t-tests, we quantify whether the contribution varies significantly based on baseflow separation techniques at a gage and or for a particular method between gage locations. This is initially being carried out at a subset of gages in Florida, with plans to expand across the state.

Rory Caskey*
University of Tampa

Analyzing a Spatial Dry Spell Climatology for the Southeastern United States

With the constantly changing climate and the risk of extreme weather events it is crucial to understand how these events have changed over time. Dry spells, or consecutive days without precipitation, are important not only climatologically, but also to people socially and agriculturally. We analyze data from 1981–2020 from stations across the southeastern United States to determine the frequency, average length, and maximum length of dry spells for each station. Our goal through these calculations to identify spatial characteristic of these dry spell events. We also assess trends in the length and extremes in dry spells for each location. Future research will be expanded across the contiguous United States and incorporate the influence of Koppen climate types on various characteristics of dry spells. These climatologies will provide a unique perspective on dry spells that may have utility in water management and provide context to the influence of climate change on the region.

Anne Chin, Natalie Restrepo, Dani ONeill, Anne-Lise Boyer
Florida State University, University of Arizona

Social Perceptions of the South Platte River: A Temporal Discourse Analysis of the Local Press

River floodplains around the world have undergone transformation owing to urban development. Drastic losses of biodiversity and habitat have occurred as a result. Whereas studies have tended to document the biophysical changes in floodplains, few have connected these changes to the shift in human perceptions through time. These shifts in human perception have lasting impacts on decision-making. This study traces the historical discourse related to the South Platte River north of the Denver metropolitan area in Colorado, using articles extracted from two local newspapers, the Denver Post and Rocky Mountain News. Changes in peoples' perceptions have occurred along floodplain transformation from natural to residential land uses, as revealed by GIS analysis. Historical mining in the area has also left a legacy, in that multi-purpose water reservoirs now dot the landscape. The South Platte River through the Denver area provides an example of a rapidly urbanizing river system, which may be useful as urbanization continues to accelerate in response to population pressures. In performing a textual analysis of the social perceptions represented in local newspapers, we can portray its effect on decision-making practices in the past and present.

Simone Gionfriddo*, M. Anwar Sounny-Slitine
University of Florida

Mapping Environmental Injustices in Florida: An Initial Analysis of Superfund Sites and Demographic Data

Environmental justice refers to a concept that all groups of people should experience equal and even amounts of environmental burden, no matter their race, age, gender, or socioeconomic status. At times, environmental injustices occur, in which a certain group of individuals experience a heavier environmental burden than other groups. This study utilizes a difference of differences approach to identify groups experiencing a disproportionate amount of environmental burden associated Superfund site proximity. Superfund sites are places that have been polluted or contaminated by hazardous materials, as determined by the Environmental Protection Agency (EPA). The initial finding of this study indicates that one racial group experiences a higher level of burden when compared with other racial groups. The researchers plan to use similar methods to assess other demographic factors, such as gender,

age, educational attainment, and income, to explore the intersectionality of these environmental injustices.

Justin Grant*, Kisha Mulenga, Kelly M. San Antonio, Hyun J. Cho, Juan Calderon, Seenith Sivasundaram, Farahnaz Golroo
Bethune-Cookman University (NASA MUREP DEAP)

NASA DEAP Institute: A Three-University Consortium toward Improving Satellite Data-Based Coastal Flood Segmentation using Machine Learning

Rising sea levels and climate change are causing growing concern, especially in areas like Florida's northern Atlantic shoreline and the Indian River Lagoon. To tackle concerns of coastal resources for local communities, the NASA MUREP DEAP Institute formed a research partnership led by Bethune-Cookman University, Alabama A&M University, and Embry-Riddle Aeronautical University to expand scientific knowledge on the spatial and temporal consequences of variations in water levels. Our current research incorporates data from NASA's satellite imagery, tidal data, weather predictions, and photos from beach cameras with machine learning to increase the accuracy of predicting overall water levels and better understand short-term storm events to long-term sea level rise. Field methods include using RTK technology to measure shoreline changes and generate digital elevation models during routine beach-profile surveys. Our primary areas of interest are sites along the Indian River Lagoon and the northern Atlantic coastline of Florida, which can provide various hydrological conditions for model validation. In addition to such technical improvements, community resilience through early warning for flooding and better resource management strategies are also in focus under the venture known as DEAP. These inputs will support improved coastal management and protection methods by assisting our model in forecasting water levels, including wave run-up and storm surge during future extreme weather conditions.

Sabina Gyawali*, A Sanjeev Luintel, Erik N. Johanson, Taber Friedel, Sally P. Horn
Florida Atlantic University, University of Tennessee

Pollen and Vegetation Trends across the Little Ice Age at Laguna Danta, Costa Rica

This study presents the results of our palynological analysis of the vegetation and environment changes at Laguna Danta, Costa Rica. The study site is a small tropical lake (1.7 ha) that lies at an altitude of 2451 m. A sediment core was collected at the deepest part of the lake (4.97 m) for multiple environmental analyses. This new research examines the pollen record at Laguna Danta that spans 800 years, including the period spanning the Little Ice Age. We processed the lake sediments using standard pollen protocols and counted a minimum of 250 pollen grains per level with Poaceae and Myrtaceae having the highest counts. The relatively high number of Poaceae over time indicates a cleared landscape likely linked to agricultural activity over time, which matches existing the interpretations from sediment, charcoal, and isotope records at Laguna Danta. Shifting abundance of Myrtaceae and Ephedraceae at specific depths indicates irregular drier periods, moisture content, or forest expansion or retraction in the watershed. These ecological shifts in the Laguna Danta record coincide with known regional climate events in the past. Our pollen record provides further knowledge and context about vegetation changes at the local level in southern Pacific Costa Rica.

Gavriella Hecht*, Jason K. Blackburn
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Spatial Ecology and Epidemiology Research Laboratory
Emerging Pathogens Institute

Spatiotemporal Analysis of Dengue Fever in Puerto Rico: Investigating Disease Patterns Amid Demographic Shifts (2013–2023)

Dengue, a mosquito-borne disease caused by infection with dengue virus (DENV), poses a significant global public health threat, with an estimated 390 million infections and 20,000 deaths annually. In Puerto Rico, recurrent outbreaks have compounded public health challenges, culminating in a public health emergency declaration in 2024 due to escalating case numbers. Simultaneously, Puerto Rico

has experienced a steady population decline over the past decade, reshaping its demographic landscape and potentially altering disease transmission dynamics. This study examines the spatial and temporal patterns of dengue cases in Puerto Rico from 2013 to 2023, with a focus on identifying how these demographic shifts may have influenced disease clustering. Municipality-level dengue case data from the Puerto Rico Department of Health were analyzed using retrospective space-time permutation analysis in SaTScan to detect statistically significant clusters of cases across all 78 municipalities. The analysis aimed to pinpoint high-risk areas and emerging temporal trends, providing new insights into the interplay between population density, spatial distribution, and dengue transmission. By leveraging spatiotemporal methods, this study demonstrates the importance of integrating advanced analytical tools with epidemiological data to enhance dengue surveillance and inform targeted public health interventions. Future research will incorporate additional landscape-level risk factors, such as environmental and socioeconomic variables, to refine strategies for mitigating dengue transmission and to adapt interventions to Puerto Rico's evolving public health needs.

Caroline Huguenin*
University of Florida

Assessing extreme dry spells across the Tempisque-Bebedero River Basin, Costa Rica

In this paper, we investigate the spatial and temporal variability of extreme dry spells in the Tempisque-Bebedero River Basin (TBRB) in northwestern Costa Rica, a region that has been identified as highly sensitive to the El Niño Southern Oscillation (ENSO). Using daily precipitation data from three meteorological stations located along a North to South gradient in the TBRB we define dry spells as periods with less than 0.2 mm of rainfall for five consecutive days or more. We examine the magnitude and frequency of dry spells, total number of days without rain, and precipitation as our variables influencing drought during warm, cool, and neutral ENSO phases using the Oceanic Niño Index (ONI). Our analysis focuses on the rainy season, which spans from May to October, when dry spells have the most significant impact on agriculture and water resources.

We find that ENSO phases distinctly influence dry spell characteristics. El Niño conditions correlate with increased frequency and magnitude of dry spells particularly in the northern and middle parts of the basin, while La Niña conditions generally reduce dry spell occurrence. Neutral phases exhibit high variability, especially in the southern part of the basin. The study highlights the complex interplay between ENSO phases and local climatic factors, emphasizing the need for localized drought management strategies. Understanding these dynamics is essential for enhancing the resilience of vulnerable communities like those in the TBRB.

Ava Johnson*, Rachel Walsh
University of Florida

Mapping the Loammi Skipper

The loammi skipper (Atrytonopsis loammi) is a small, fuzzy, endangered butterfly. Although it once resided throughout much of the southeastern United States, today it can only be found in isolated populations across Florida (Walsh and Krueger, 2024). Its host plant, the lopsided indian grass (Sorghastrum secundum), is found in prairies and pine flats. However, due to human development, much of these habitats have been lost over the years (NatureServe Explorer 2.0.).
The purpose of this project is to generate an ecological niche model to determine the ideal habitat type for the loammi skipper, and to map these areas across Florida. Afterwards, these areas can then be assessed for risk of human development by calculating the proportions that fall within protected conservation lands, as classified by the Florida Natural Areas Inventory.

Savanah Kendrick*, **Joann Mossa**
University of Florida

Historical and Recent Trends in Sandbar Morphology Along the Upper Escambia River

This study investigates sandbar morphology along the Upper

Escambia River in Northwest Florida, focusing on the impact of Big Escambia Creek, a tributary that diverted into sand and gravel pits in 1978, introducing significant sediment into the creek and river. A restoration project in 2005 returned the river to its longer pre-avulsion course. Using historic and current aerial imagery and USGS flow and stage data, we address three research questions: 1) How does sandbar area change downstream and in relation to the junction with Big Escambia Creek? 2) How does sandbar area differ historically versus recently for the same flow level? 3) How does sandbar area change as water level varies, and what can be learned from the residuals? Sandbars were digitized based on pixel values from the Alabama-Florida state line (RK85) to 36 km from the Hwy 90 bridge at Escambia Bay (RK0). Key findings include: 1) Sandbar area decreased downstream, with larger sandbars closer to Big Escambia Creek; 2) Sandbar areas have increased in recent years for both low and high flow-stage pairings compared to historical data; 3) While sandbar areas generally decrease with increasing flow and stage levels, positive residuals departing from trendlines align with major flood events.

Paired analyses of sandbar areas at high and low flow levels, pre- and post-avulsion, and pre-and post-restoration provide insights into area variability. These findings contribute to understanding sediment dynamics and the effects of floods and human disturbances, such as mining and restoration, on riverine sandbar morphology.

Michael Licea*, Barnali Dixon
University of South Florida - St. Petersburg

Reimagining Vulnerability and Resilience at Neighborhood Level: Post Helene and Milton

Traditional methods to determine vulnerability to natural hazards use biophysical and socioeconomic variables. In the face of the recent impacts from Hurricanes Helene and Milton – where many neighborhoods not located in a flood zone were impacted – traditional methods for vulnerability assessment and their relationship to community resiliency must be revisited. Effective resilience plans are needed to help us cope with extreme weather events. To ensure effective resiliency plans are developed and implemented, we must extend traditional vulnerability assessment methods to include new variables. The research question for this project is, how well do traditional vulnerability assessment methods characterize neighborhood vulnerability to Helene and Milton? Can the addition of new variables help us identify neighborhoods that were impacted by these recent hurricanes? New variables to be included in vulnerability assessment are: the condition of stormwater infrastructure, dependence on stormwater pumps, and high tides that can impact the drainage capacity of storm drains, causing nuisance flooding. Our study area is neighborhoods in St. Petersburg, Florida. Once the revised vulnerability assessment is completed, potential resilience (or lack thereof) will be determined by overlaying property sales data on vulnerable zones. The lack of resilience will be determined by proxy of the number of houses for sale within the vulnerable zones. The outcome will help us identify the most/least resilient neighborhoods in St. Petersburg and will allow us to further analyze factors that make one neighborhood more or less vulnerable or resilient than another.

Sanjeev Luintel*, Erik N. Johanson, Xavier Comas
Florida Atlantic University

An Initial Record of Long-term Environmental Change at a Northern Boreal Peatland, Maine, USA

This study presents the initial results of our Loss on Ignition (LOI) and Magnetic Susceptibility (MS) analyses from a peat core taken at Sawtelle Heath, Maine, USA. The 7.5 m long recovered peat core contains a currently undated environmental record likely spanning the Holocene. The goal of the project is to reconstruct past climate and environmental conditions over time to better understand the peatland system. We conducted the LOI analysis on the peat core using a 4 cm sampling interval to measure percent organic matter (OM). We also analyzed the core using MS at a contiguous 1 cm sampling interval down core. Perturbations in our two datasets over depth reflect changes to the environmental conditions in the peatland over time. Such proxies for environmental change can show local paleoclimate activity, shifts in the water levels, or changes in mineral

input sources. This novel work contributes to existing geophysical research at the study site and helps to identify how resilient the peatlands are to climate stress over time. Future work will include additional environmental proxy analyses, such as peat humification, charcoal, and pollen, and developing an age-depth model to accurately date these trends.

Erin Mariotti*, Johanna Engström, Yujie Hu
University of Florida

Optimizing Solar-Powered EV Charging Infrastructure in Florida

Florida's rapid adoption of electric vehicles (EVs) necessitates strategic advancements in charging infrastructure to ensure equitable access and sustainability. This study evaluates the spatial distribution of Florida's EV charging stations, revealing significant disparities between urban and rural areas. Urban centers, such as Miami, Tampa, and Orlando, host most stations, with high usage levels identifying these areas as prime candidates for solar-powered infrastructure to reduce grid strain and emissions. Conversely, rural regions, including the Panhandle and northern Florida, face sparse station networks, exacerbating range anxiety and limiting equitable access. Geospatial analysis and proximity modeling identify high-priority clusters, with a focus on urban areas for immediate solar integration and rural regions for large-scale solar installations. Solar-powered stations are shown to enhance infrastructure resilience during extreme weather events, such as hurricanes, while providing opportunities to feed surplus solar energy back into the grid. The findings underscore the potential of leveraging Florida's abundant solar resources to address geographic disparities, improve accessibility, and support sustainable transportation. However, challenges such as site-specific solar feasibility, shading constraints, and economic barriers in rural areas must be addressed. By prioritizing targeted investments and fostering public-private collaborations, Florida can establish a more resilient and equitable EV network, advancing its clean energy and mobility goals.

Risa Patarasuk

Alachua County BOCC

Septic Systems Heat Map of Alachua County, Florida

This heat map shows clusters of septic systems in Alachua County, Florida. The map was created using data downloaded from the Florida Water Management Inventory Project website. The information was converted from a parcel polygon layer to a point layer in ArcGIS Pro. Heat map symbology was applied to highlight areas of dense clustering. Septic systems contribute to high nitrogen and phosphorus levels in natural waterbodies and aquifers causing excess algal growth. Excess algal growth from high nutrient levels is a condition that some Alachua County rivers and springs face. This map was created to assist in identifying areas near impaired water bodies where existing septic systems can feasibly be eliminated by connecting buildings to centralized sewer systems to prevent further contamination. The heat map was created as part of Onsite Sewerage Treatment and Disposal (OSTDS), or known as septic systems, remediation plan required by The Florida Department of Environmental Protection.

Jennifer Igwedinma Paul*, Scott Markwith
Florida Atlantic University

Empathy Development and Long-Term Environmental Stewardship: Evaluating the Impact of Nature-Based Learning and Geoliteracy in Early Childhood

As climate change, biodiversity loss, and deforestation continue to accelerate, the need for education that does more than convey scientific facts has become increasingly clear especially in younger generations. Traditional environmental education often emphasizes teaching scientific facts and concepts, which are valuable but can sometimes feel disconnected from personal experience. While knowledge is important, it doesn't always translate into long-term conservation efforts. Empathy-driven environmental education (EDEE) takes a different path by encouraging emotional connections with nature alongside scientific learning, helping children see

themselves as part of the environment they are learning about. This presentation explores how emotional engagement and scientific understanding can inspire long-term pro-environmental behavior (Chawla, 2009; Ardoin, Bowers, & Gaillard, 2020).

EDEE draws from several foundational theories, including Wilson's (1984) Biophilia Hypothesis, which emphasizes humans' innate emotional connection to nature, and the Empathizing-Systemizing Theory (Baron-Cohen & Wheelwright, 2004), which explains the balance between cognitive understanding and emotional connection. Additionally, Kolb's (1984) Experiential Learning Theory highlights the importance of direct, hands-on experiences in fostering both cognitive and affective learning. Together, these frameworks suggest that fostering both cognitive empathy (intellectual understanding) and affective empathy (emotional concern) can enhance environmental literacy and motivate conservation behavior (Nisbet, Zelenski, & Murphy, 2009).

This presentation will focus on how different learning environments influence emotional engagement and educational outcomes. Natural settings, such as forests and wetlands, offer direct sensory immersion that can strengthen emotional bonds with nature (Wilson, 1984). Semi-natural spaces, like botanical gardens, balance guided instruction with limited nature exposure, while artificial environments, including museums and digital simulations, often emphasize cognitive learning over emotional depth (Ardoin et al., 2020). Comparative findings from the literature will be presented to explore how these settings impact empathy development and pro-environmental behavior (Chawla, 2009).

Additionally, socio-economic barriers can significantly influence access to quality environmental education. Children in underfunded schools or urban environments often face limited access to green spaces and experiential learning opportunities, which may hinder the development of emotional connections with nature (Stern, Powell, & Ardoin, 2011). Culturally responsive strategies, such as inclusive curricula and community partnerships, will be highlighted as potential solutions (Gay, 2002).

Though my current research is still in the early stages and I do not yet have results to share, this presentation will draw from a wide body of existing literature to explore how emotional engagement can transform environmental education. My goal with this presentation is to explore and offer insights as to how empathy can be used as a powerful tool in environmental education—one that not only informs but also inspires. By focusing on how emotional engagement influences care for the environment, I hope to encourage conversations on making this approach more widely accessible, ensuring every child has meaningful opportunities to connect with nature, regardless of their background.

Briar Z. Pierce*, Joann Mossa
University of Florida

Detecting Human and Environmental Changes in the Landscape Using Historical Maps and LiDAR Datasets

Comparing modern and historic landscapes allows researchers to detect and quantify changes in the landscape that have occurred over time. To accurately determine the magnitude of changes in a DEM of Difference (DoD), positional uncertainties within the input data must be understood and quantified to establish confidence in the results. The quantification of uncertainties in historical topographic datasets poses challenges to researchers due to a lack of available documentation and a lack of understanding of historical map production processes. Issues with quantifying uncertainties of modern elevation datasets like LiDAR can also occur. This study investigates uncertainties in historical topographic maps and modern publicly available LiDAR data by examining the positional uncertainties in two DEMs, one derived from a 1940 topographic map and the other from a 2016 LiDAR survey. An error budget model, applied to a DoD operation, was formulated to quantify uncertainties including map accuracy (vertical and horizontal), slope, vertical datums, and georeferencing.

Michelle Ruiz*
University of Florida

In the Path of Destruction: Spatial Relationships Between Social Vulnerability and Property Losses After Hurricane Michael

Every hurricane season, tropical storms and hurricanes threaten the Florida coastline and its residents. Hurricane Michael was the last Category 5 hurricane to make landfall in Florida, resulting in catastrophic damage in the panhandle region. Before landfall, Hurricane Michael underwent rapid intensification and intensified from a Category 2 hurricane to a Category 5 major hurricane within 24 hours. Rapid intensification is expected to increase with climate change due to warmer sea surface temperatures (SSTs). This increase in intense storms, coupled with continued population growth in coastal regions, can result in more damage and losses for vulnerable populations in the future. This project builds on prior research that used an Ordinary Least Squares (OLS) regression model to predict property losses for homeowners post-Hurricane Michael using the CDC's Social Vulnerability Index (SVI) indicators. To further explore these relationships, this study applies Geographically Weighted Regression (GWR) models to assess the spatial impact of Hurricane Michael on populations and the built environment. Findings indicate that per capita income had the greatest influence on the total damage losses for homeowners. The GWR model may better illustrate the spatial heterogeneity of property losses. Social vulnerability indices can help stakeholders provide support and mitigation strategies to vulnerable populations. SVI indicators can be useful for understanding the impacts of natural hazards on vulnerable populations, even when the overall index is not a significant predictor.

Md. Shamsudduha Sami*, Katherine A. Serafin, and Gabrielle Quadrado
University of Florida

Evaluating the Spatio-Temporal Impact of Storm Surge Duration and Magnitude on Extreme Coastal Water Levels Across U.S. Coastlines

Understanding the magnitude and duration of extreme storm surge events is crucial for assessing their potential to cause severe damage in coastal areas. This study focuses on how storm surge duration influences extreme water levels across U.S. coastlines, identifying how prolonged events interact with other hydrodynamic processes to elevate water levels. Hourly water level datasets from National Oceanographic and Atmospheric Administration (NOAA) tide gauges across the U.S. are used to extract extreme water levels and storm surge events through a peak over threshold (POT) approach with a 99.5 percentile. A mean lower threshold is used to identify the start and end of a storm surge event, while an extreme storm surge and its corresponding duration are only considered as the time the storm surge is over the threshold. The duration of the extreme water level is measured by the total number of hours it remains over the extreme water level threshold during the entire storm surge event. Our findings indicate that there is a distinct spatial variability in extreme storm surge magnitude across U.S. coastlines; however, there is very little variation in the duration. There has been a noticeable increase in the frequency of extreme water level events due to long-duration extreme storm surge events. We also found that not all extreme water level events are driven by extreme storm surge events, while many of the extreme water level events are associated with other hydrodynamic processes.

Sienna Silvest*, Joann Mossa
University of Florida

Anthropogenic Modifications of the Geomorphology in the Lower Savannah River and Harbor for the Improvement of Navigation

Modification projects of the Savannah River and Harbor date back to 1826 by the U.S. Army Corps of Engineers (USACE). The original plans involved removing obstructions that had been placed for Civil War defense purposes, before transitioning to navigation improvement. This study focuses on using recorded information from the USACE Chief of Engineers reports and other sources that include; hydrographical surveys, LiDAR data, and topographical maps, of the lower 51.5 kilometers of the Savannah River to uncover

the history of dredging that has significantly altered the river and harbor's natural geomorphology. Analysis revealed the geomorphology was extensively impacted from the late 1800s to the early 21st century. In the mid-1900s, artificial cut-offs shortened the trip from the Savannah Harbor to the city of Augusta by 41.8 kilometers. The depth of the Savannah Harbor was increased by 11.6 meters at mean low water from 1873 to 2022 to adapt to the increasing maritime transportation. To support this deepening, wing dams and training walls were constructed to divert flow into an artificially smaller channel, further altering the natural geomorphology of the landscape. These flood control structures have formed new islands and enlarged others in area and elevation, in some cases with obvious anthropogenic features such as Jones Island that has mounds of dredge spoilage on the expanded area from Wing Dam 33 being constructed. These modifications have potential consequences for aquatic and terrestrial biota and local communities.

Jessica Striley*
University of Florida, Department of Geography

24 Years of Land Cover Change in Niassa's Miombo: Random Forest vs. Rule-Based Classification

Niassa Special Reserve in Mozambique is approximately the size of Swizerland and contains one of the largest remaining intact miombo woodlands. Lugenda Wildlife Reserve (LUWIRE) is a 4550 km2 leased block within Niassa that is operated as a safari camp for hunting and adventure tourism and contains 9 communities and ~5000 people. Both LUWIRE and community activities contribute to conservation success like anti-poaching and illegal forestry patrols, and to land cover conversion to agriculture, roads, and camps. Understanding the impact of these land use patterns would enable better conservation planning and possibly much-needed funding. However, this mixed savanna/miombo landscape is notoriously difficult to classify because of spectral similarity across structural vegetation differences. We sought to analyze land cover change in this area across a 24-year period after LUWIRE's inception using a combination of field training data and satellite imagery to understand the impact of wildlife economy land use. Results were generated

using both a random forest classification and a user-defined rule-based algorithm. Results indicate an increase in forest cover within Niassa with increasing land conversion in the western portions of Niassa and buffer lands surrounding the reserve. We found the rule-based algorithm to have higher classification accuracy compared to the random forest method. Classification of a gradient landscapes into discrete classes requires arbitrary spectral separation, but this method allows for spectral overlap of classifications guided by local expert landscape understanding, increasing the specificity of the analysis. This proof-of-concept provides a method for additional analyses in the area.

Mason Theurer*, Jane Southworth, Brian Child, M. Anwar Sounny-Slitine
University of Florida

"Fracturing Ecological Frameworks": Fragmentation characteristics of sandhill and scrub habitats within the Florida Wildlife Corridor versus outside, between 1995, 2004, and the present

The division of natural environments into disjunct patches is a phenomenon within conservation ecology that is becoming increasingly problematic. This study quantifies the habitat fragmentation characteristics of two rare landcover types in Florida, scrub and sandhill, both inside and outside the boundaries of a statewide land conservation project known as the Florida Wildlife Corridor. To do so, landcover maps created by Florida's five water management districts were acquired for 1995, 2004, and 2022. Using landscape metrics within the software Fragstats, the fragmentation of targeted land covers was quantified over time inside and outside the Florida Wildlife Corridor. My findings indicate that higher levels of fragmentation occur outside the boundaries of the land conservation project, showing that the corridor's aim is functioning. However, this also indicates that attention needs to be given to rare habitat types across the state regardless of land designation. This study offers insight into the effectiveness of state legislation aimed at acquiring land for conservation corridors and legal protection. It also offers a

perspective on considering factors other than corridor potential for conservation land.

Joel Wixson*
University of Florida

Using Google Earth Engine to Detect Sandbar Change in the Lower Mississippi

Rivers are continually changing environments. They can be influenced by human activities as well as periodic environmental changes in flow and sediment. Understanding the role of sandbars in dynamic systems affects ecosystem management as the persistence of river sandbars plays an important role in providing aquatic and terrestrial habitat for wildlife while also contributing to the stability of the local river ecosystem. Another application of monitoring sandbars is navigation hazards, particularly in large rivers such as the Mississippi River. Using satellite imagery and remote sensing techniques provides an efficient way to measure and monitor changes in ecological habitats and sandbar area. My research was focused on the stretch of the Mississippi river between Baton Rouge, LA and Vicksburg, LA. Landsat aerial imagery from 2010 until 2023 was used to create Normalized Difference Vegetation Indices (NDVI). These indices were categorized and then compared between years and flood/drought years to determine how sandbars and shore habitat change during the relatively low and high flow events during the fall season (November). Very little change was detected between sampling years with much of the river sandbar habitat remaining the same. Sandbar habitat did increase slightly but this could be due to the slight differences in discharge levels between sampling years.