Spatial Structures in the Social Sciences
2026 Summer GIS Institute

Final Presentation Program

June 12, 2026

PSTC Seminar Room (Mencoff Hall 205)
68 Waterman Street, Providence RI 02912

10:30 – 11:00 am	Brunch & **Opening Remarks**
11:00 am – 11:40 pm	**Session I:** GIS and Health
11:40 am – 12:00 pm	**Session II:** Historical GIS
12:00 – 1:00 pm	**Lunch**
1:00 – 2:00 pm	**Session III:** GIS in Environment and Society
2:00 – 2:15 pm	Certificate Presentation & **Closing Remarks**

PARTICIPANTS

Ayodeji Adegbite (History)

Ligia Arguilez (Institute at Brown for Environment and Society)

Daniel Mayo (Department of Behavioral and Social Sciences | School of Public Health)

David Ogoru (History)

Ayesha Rahim (Department of Health Services, Policy & Practice | School of Public Health)

Edom Tesfa (Annenberg Institute at Brown)

PROGRAM

SESSION I:

GIS AND HEALTH

[11:00am] Ayesha Rahim, *Investigating Medical Debt Litigation in Connecticut Through Geospatial Dimensions*

[11:20am] Daniel Mayo, *Mapping Opportunities for Pre-Exposure Prophylaxis Implementation in High HIV and Overdose Burden Communities*

SESSION II:

HISTORICAL GIS

[11:40am] Ayodeji Adegbite, *Remapping the Historical Epidemiology of Yellow Fever in West Africa 1910 - 2020*

LUNCH BREAK, 12:00 PM – 1:00 PM

SESSION III:

GIS IN ENVIRONMENT AND SOCIETY

[1:00pm] Edom Tesfa, *Mapping Youth-Serving Non-Profits in Rhode Island*

[1:20pm] David Ogoru, *Extractive Ecologies: Mapping Spatial Relationships between Extractive Activities and Aquatic Ecosystems in Coastal Nigeria*

[1:40pm] Ligia Arguilez, *Where the Creosote Bush Grows: Mapping the Quintessential North American Hot Desert Plant*

PRESENTATION ABSTRACTS

Ayodeji Adegbite – Remapping the Historical Epidemiology of Yellow Fever in West Africa 1910 - 2020

Yellow fever was one of the deadliest and feared diseases in West Africa and America during the nineteenth and early twentieth centuries, and its epidemiological mapping played a central role in how colonial authorities understood and represented Africa. This project examines the paradox of historical epidemiological maps that simultaneously claimed scientific neutrality and yet reinforced racialized geographies of Africa. British colonial maps, such as those in Dr. Arthur E. Horn's 1913 report, did more than record outbreaks; they helped construct Africa as a diseased landscape and Africans as biologically distinct. Concepts such as "black immunity"—a medical inversion of yellow fever as an "African disease"—emerged from these mappings and shaped public health policy, racial hierarchies, and the spatial identity of West Africa.

Using Horn's epidemic maps as a case study, this project analyzes how political, economic, and ecological transformations under British colonialism produced the very disease environments these maps purported to objectively depict. Drawing on archival materials and historical GIS methods, I examine how yellow fever maps were coproduced with other colonial cartographies, including railway, commercial, and administrative maps. My aim is to uncover the histories embedded in these maps and to assess their consequences for both colonial state and contemporary global health narratives. By interrogating the visual and spatial logics of early twentieth century yellow fever cartography, this work highlights how mapping practices shaped, and continue to shape, the racialized geographies of disease in Africa and beyond.

Ligia Arguilez – Where the Creosote Bush Grows: Mapping the Quintessential North American Hot Desert Plant

In studying the historical trajectory of Larrea tridentata, a very common desert shrub called the creosote bush, I hope to map the plant's distribution in relation to 1) the U.S.-Mexico border, 2) other common desert plants, 3) tribal nations in the U.S. Southwest and Mexican Northwest, and 4) to calculate the area of the plant's distribution in miles around a border buffer. Ultimately, I plan to continue this mapping toward the end of approximating the expansion of the shrub since the Spanish conquest and the introduction of cattle and sheep, among other "old world" ungulates with GIS data.

My interest in spatial mapping is part of my book manuscript research. I would specifically like to be able to mark historical sources across time and geographies to create a sense of how distribution, knowledge, and uses of the plant have changed over time. My study site follows the shrub's distribution across the Chihuahuan, Sonoran, and Mojave Deserts, from central Mexico to southern California. GIS mapping is potentially helpful to this historical and environmental study in many ways. I would like to be able to track the shrub's expansion over time with ecological and botanical sources. I would also like to use oral histories to mark where and how people have engaged with the plant over time and examine the relation between places and practices.

Daniel Mayo – Mapping Opportunities for Pre-Exposure Prophylaxis Implementation in High HIV and Overdose Burden Communities

HIV and drug overdose continue to disproportionately affect individuals with substance use disorders, highlighting the need for integrated prevention approaches. Outpatient substance use treatment facilities may provide an important opportunity to expand access to pre-exposure prophylaxis (PrEP), a highly effective HIV prevention strategy. This project examines how HIV burden, overdose burden, and PrEP availability are distributed across the Northeastern United States. By identifying communities experiencing elevated HIV and overdose burden alongside limited access to PrEP services within substance use treatment facilities, this study seeks to highlight potential gaps in prevention infrastructure. Findings may help inform public health and implementation efforts aimed at expanding HIV prevention services in settings that serve populations at increased risk, ultimately supporting more targeted and equitable delivery of PrEP.

David Ogoru – Extractive Ecologies: Mapping Spatial Relationships between Extractive Activities and Aquatic Ecosystems in Coastal Nigeria

Nigeria's coastal littoral is characterized by an extensive network of interconnected rivers, creeks, estuaries, and lagoons that drain into the Atlantic Ocean. These aquatic environments have historically supported diverse fisheries, transportation networks, recreational activities, and economic development. From the colonial period to the present, however, extractive activities—including oil exploration, dredging, and large-scale infrastructure development—have transformed coastal landscapes and altered ecological relationships between humans and aquatic environments. While these activities have contributed to economic growth, they have also generated significant environmental changes affecting both human and non-human aquatic species.

This project employs Geographic Information Systems (GIS) methods to examine and visualize the spatial relationships between extractive activities, fish species distributions, coastal beaches, and aquatic ecosystems across coastal Nigeria. Drawing on datasets compiled from local and international organizations, government records, historical documents, scientific literature, and other primary and secondary sources, the study seeks to identify areas where extractive activities overlap with the ecologies of aquatic species. By mapping the intersections between environmental resources, state-led economic activities, and human interactions with coastal landscapes, the project will reveal how different environmental relationships have shaped and continue to shape ecological change along Nigeria's coast.

Ayesha Rahim – Investigating Medical Debt Litigation in Connecticut Through Geospatial Dimensions

Medical debt is a primary driver of consumer collection activity in the United States, often resulting in aggressive legal actions that threaten the economic security of vulnerable populations. This research utilizes Geographic Information Systems (GIS) to analyze the spatial landscape of medical debt litigation within Connecticut's civil court system, where creditors face stricter evidentiary and procedural requirements than in many states. By examining litigation patterns in this regulatory environment, the study assesses whether potentially harmful or unequal outcomes persist despite these consumer protections. Through integrating and geocoding administrative data from the Connecticut Judicial Branch,

I construct a spatial dataset to examine the geographic relationship between litigious medical providers and the patients they sue. The study specifically focuses on measuring the jurisdictional distance between providers and defendants to identify patterns and clusters of litigation intensity. Furthermore, this analysis maps these legal actions against neighborhood-level sociodemographic characteristics to determine if these practices disproportionately impact specific communities, building on broader evidence of racial and socioeconomic disparities in debt claims. By identifying clusters of high litigation, along with evaluating their characteristics and outcomes, this study aims to provide foundation for further analyses on how administrative processes and the financialization of health care shape judicial outcomes for disadvantaged residents in Connecticut.

Edom Tesfa – Mapping Youth-Serving Non-Profits in Rhode Island

Children and adolescents in the U.S. spend more of their waking hours outside of school than within it (Larson and Verma, 1999). How young people spend this out-of-school time (OST) is consequential for all aspects of their development. However, youth have unequal access to programs and services that support their healthy development, with low-income families, racialized families, families with limited transportation options, and families in rural settings expressing the most unmet need (Afterschool Alliance, 2025). This project leverages Geographic Information Systems (GIS) to assess the spatial relationship between poverty, youth population, and youth-serving non-profit organizations in Rhode Island. Using a dataset of 292 non-profit organization registrations from the Rhode Island Secretary of State, data from the 2019-2023 American Community Survey, and a typology of OST organizations (Baldridge et al., under review), we pose the following questions: Where in Rhode Island are youth-serving non-profits clustered? What types of services for youth are least available in the state's core cities (cities with the highest concentration of children living in poverty; Rhode Island KIDS COUNT, 2026)? Preliminary findings show that, predictably, youth-serving non-profit organizations are clustered in Rhode Island's core cities and primary population centers of Providence, Pawtucket, Central Falls, Woonsocket, and Newport. However, there is a notable absence of non-profit OST organizations in Woonsocket providing tutoring, enrichment, arts education, and behavioral and physical health services to children and youth. This study is conducted in partnership with Rhode Island KIDS COUNT to inform the organization's child well-being advocacy efforts and provide community members with information on the opportunities available to local youth.