

Spatial Structures in the Social Sciences 2020 Summer GIS Institute

Final Presentation Program

May 29, 2020

All times indicated are in Eastern Standard Time (EST)

9:30 – 9:40 am	Opening Remarks
9:40 – 10:40 am	Session I: GIS and Health I
11:00 am – 12:00 pm	Session II: GIS Applications in the Social Sciences I
12:00 – 1:00 pm	Lunch Break
1:00 – 2:00 pm	Session III: GIS Applications in the Humanities
2:20– 3:00 pm	Session IV: Historical GIS
3:20 – 4:20 pm	Session V: GIS Applications in the Social Sciences & Health II
4:20 – 4:30 pm	Certificate Presentation & Closing Remarks
4:30 pm	Close of Conference

PARTICIPANTS

Laurel D. Bestock (Archaeology and the Ancient World)

Melody A. Chapin (Music)

Sam Coren (American Studies)

Catherine K. Ettman (School of Public Health)

Priya Y. Gajjar (School of Public Health)

Bhanu Joshi (Political Science)

Brian G. Knight (Economics)

Samuel Kye (Spatial Structures in the Social Sciences)

Yoojin Lee (School of Public Health)

Subadevan Mahadevan (Sociology)

Rebecca R. Marisseau (History)

Connor J. Staggs (Political Science)

Anabelle R. Suitor (Anthropology)

Kathryn D. Thompson (School of Public Health)

PROGRAM

SESSION I:

GIS AND HEALTH I

[9:40am] Kathryn D. Thompson, *The effect of provider characteristics on antiretroviral therapy adherence and racial disparities among U.S. Medicaid beneficiaries*

[10:00am] Catherine K. Ettman, *COVID-19, parks, and stress: access to public parks in Massachusetts during the COVID-19 pandemic*

[10:20am] Priya Y. Gajjar, *The spatial distribution of low birth weight and environmental factors in Rhode Island*

BREAK, 10:40 – 11:00 AM

SESSION II:

GIS APPLICATIONS IN THE SOCIAL SCIENCES I

[11:00am] Samuel Kye, *White Havens and the Preservation of Segregation in the Contemporary Metropolis*

[11:20am] Bhanu Joshi, *Spatial Variation in Development Outcomes*

[11:40am] Brian G. Knight, *Immigration and Crime: Evidence from the Venezuela-Colombia border*

LUNCH BREAK, 12:00 – 1:00 PM

SESSION III:

GIS APPLICATIONS IN THE HUMANITIES

[1:00pm] Sam Coren, *Watershed Metropolis: how urban rivers have shaped, and been shaped by, urban growth in greater Providence, Rhode Island, 1920-2020*

[1:20pm] Melody A. Chapin, *Visualizing Noise Complaints in Washington, D.C.*

[1:40pm] Anabelle R. Suitor, *Agrarian Change and Fishing Labor in Southeast Coastal and Deltaic Bangladesh*

BREAK, 2:00 – 2:20 PM

**SESSION IV:
HISTORICAL GIS**

[2:20pm] Laurel D. Bestock, *Cultural interactions at Uronarti*

[2:40pm] Rebecca R. Marisseau, *Whaling City: A Spatial Analysis of Whale Fishery in 19th-Century New Bedford*

BREAK, 3:00 – 3:20 PM

**SESSION V:
GIS APPLICATIONS IN THE SOCIAL SCIENCES & HEALTH II**

[3:20pm] Subadevan Mahadevan, *Informal settlements and urban service delivery access*

[3:40pm] Yoojin Lee, *COVID-19 pandemic overview at the county level in New England: by selected socio-economic characteristics, impact on Nursing Home residents.*

[4:00pm] Connor J. Staggs, *Urban Religious Segregation and Public Service Access in India*

PRESENTATION ABSTRACTS

Laurel Bestock – Cultural interactions at Uronarti

Uronarti is a fortress in northern Sudan that was constructed in the early 2nd millennium BC as part of an expansion of pharaonic Egypt to the south, into Nubia. Excavations at Uronarti in the 1920s were concentrated on answering questions about royal Egyptian prerogatives. Since 2012 a Brown team has been working at the site focusing instead on examining what it was like to live at the fortress and in particular how interactions between Egyptians and Nubians took place in this frontier zone. Mapping is an essential part of both recording and visualizing some elements of the archaeological project. It is also complicated – there are no census tracts or base maps to work with, and the sheer remoteness of the site and difficulty of life there inhibit even some standard archaeological mapping techniques.

In my presentation I expect to show the following: An introduction to the landscape and historical background. The old maps, with a discussion of why they are inadequate for answering current research questions. This is largely because a) they are not phase plans, representing (misrepresenting, we have found) an idealized original plan of the fortress and omitting how it changed over time, and b) they look only at the fortress, while Egyptian presence in the region was spread elsewhere, too. The locations of the places we have excavated and surveyed and the nature and phasing of the architecture we have uncovered.

Melody Chapin – Visualizing Noise Complaints in Washington, D.C.

“Noise,” unwanted or unenjoyable sound, is a recognized problem in cities all over the world. However, scholars have shown that “noise” is in the ear of the beholder, informed by an individual’s or community’s own set of listening practices (Kahn 2003, Bijsterveld 2008). Furthermore, city policies and upper-class residents have been known to systemically target music-making practices of subaltern groups through noise control (Roberts 1990, Sandoval 2010, Stoeber 2016), and local news outlets in gentrifying cities have reported similar attempts of new residents in recent years (Grimm 2015, Ayers 2015, Lang 2019).

In Washington, D.C., listening to and silencing amplified music have become overtly political acts, manifestations of the racial and socioeconomic inequities that underlie the city’s ongoing process of urban renewal. Demands from new residents that the city impose limits on acceptable music levels in public space often conflict with aspects of black and working-class Washingtonian cultural identity and pose an ongoing challenge for the shrinking black population of a district once dubbed a Chocolate City. In the past two years, these racial and socioeconomic tensions have stimulated substantial civic engagement over issues of noise legislation, drawing responses from black activist groups, anti-noise coalitions, and the District’s Department of Planning.

What can a spatial analysis of noise complaints tell us about an increasingly gentrifying Washington, D.C.? This presentation will provide an overview of my preliminary results of mapped noise complaints from April and May, 2018. First, I discuss the conceptual and technical difficulties involved in mapping noise complaints. I then share some of my current work using ArcGIS mapping and some spatial analyses. Finally, I discuss how such spatial analysis informs my overall dissertation project about community listening practices and cultural conceptions of “noise.”

Sam Coren – Watershed Metropolis: how urban rivers have shaped, and been shaped by, urban growth in greater Providence, Rhode Island, 1920-2020

Watershed Metropolis is a study of urban growth corridors along the Narragansett Bay watershed in the metropolitan region of Providence, Rhode Island. Over the past hundred years, waterways, water-supply and water-treatment systems have played a profound but largely hidden role in shaping the Providence metropolis and, with increasing force over time, have defined the limits to regional urban growth. Combining history and ethnography, my dissertation research explores people's relationships to the watershed and how these are mediated by multiple layers of infrastructure, including the Scituate Reservoir (1925), Interstate 95 (1960s), and the Providence Hurricane Barrier (1966). As I argue, these and other public works have brought decades of intensive but uneven development to the Providence River and Pawtuxet River floodplains, to produce a metropolis whose present socio-ecological contours, and range of possible futures, are in profound ways shaped by water.

In service to this larger project, I use ArcGIS to overlay several kinds of maps chronologically from the early 1900s to the present, including USGS historical topographic maps, Sanborn insurance maps, and digital aerial photographs from the RI GIS collection. Gathered into one project, these maps provide a geographic repository for ongoing research, one that not only documents but also models spatial relationships within the watershed, so that longitudinal trends become easier to discern, narrate and theorize.

Catherine Ettman – COVID-19, parks, and stress: access to public parks in Massachusetts during the COVID-19 pandemic

COVID-19 and its consequences have both been substantial and ubiquitous traumatic events in the United States in the past few months. As of April 2020, 42 states across the United States were under stay-at-home policies. As many as 300 million Americans were disrupted from their daily lives and routines. Stress, mental illness, and risky health behaviors have been shown to follow traumatic experiences. Greenspace is known to be associated with improved mental health for populations; access to greenspace promotes health behaviors such as exercising and stress reduction. Therefore, we were interested in exploring how accessibility to green space was associated with mental health and exercise during the COVID-19 pandemic. We explore the association between stress, exercise, and accessibility of greenspace in Massachusetts using data from an original survey distributed in March 2020.

Priya Gajjar – The spatial distribution of low birth weight and environmental factors in Rhode Island

Prenatal exposure to air pollution has repeatedly been associated with a higher risk of low birth weight. Babies who are born weighing less than 2500 grams are described as low birth weight. Particularly, prenatal exposure to PM_{2.5} has been associated with low birth weight in the northeast United States. There is also evidence to suggest that proximity to traffic is a mediator of the relationship between air pollution and birth outcomes. Women living near traffic may have higher levels of exposure to air pollution beyond that captured by air quality monitoring stations. Using birth data at the census block group level from Women and Infant's hospital I explore the spatial distributions of low birth weight, exposure to levels of PM_{2.5}, proximity to traffic and greenspace in Rhode Island. Additionally, I mapped the proportion of mothers who walk to work or use public transportation as it is possible that women who walk to work or live in more walkable neighborhoods have greater exposure to air pollution. I then used multivariate

regression models to explore the association between air pollution and other environmental exposures and low birth weight while adjusting for other census block-level population factors like income. Finally, I used hot-spot analysis to identify spatial clusters of high and low birth weight values.

Bhanu Joshi – Spatial Variation in Development Outcomes

My dissertation looks at variation in developmental outcomes across Indian cities. While I posit that cities with greater co-ordination between politicians and bureaucrats deliver better outcomes, I need to first establish an empirical basis to measure development outcome variation across Indian cities. Specifically, I am looking at material and non-material development outcomes. By material I mean service provisions like water and sanitation. By non-material I mean segregation and discrimination. Although India remains a predominantly rural nation—with only about 34% of its 1.3 billion people residing in urban areas even now, cities and towns of India constitute the world's second-largest urban system (Census 2011). Where people live invariably shapes their social interactions and social networks, health outcomes, and sense of self, other and community. As "social relations are so frequently and so inevitably correlated with spatial relations", the residential locations of individuals and groups reflect the hierarchies of advantage in a society (Park 1925: 10). For example, a recent study of eight Indian cities found that historically disadvantaged castes disproportionately live in slums (Gupta et al 2009). However, a lot of these studies have looked at ward level census data and suffer from deficiencies of scale. Using a unique sample from seven cities in India (average sample of 3000), I hope to leverage the household level responses to better understand variation in development outcomes across Indian cities. The aim of the GIS project is to first, conceptualize outcomes and then decide on the method which offers spatial analysis of outcome variations.

Brian Knight – Immigration and Crime: Evidence from the Venezuela-Colombia border

Using municipal-level, monthly crime data from Colombia, we explore the effects of immigration from Venezuela on crime in bordering regions in Colombia. We compare areas close to the frontier with areas further from the frontier and exploit the closing of the border in 2015 by Venezuela and then the subsequent re-opening one year later. The crime data include nationality, allowing us to compare Venezuelan and Colombian victims. While preliminary results document some increases in crime rates close to the frontier, those results are largely driven by crimes with Venezuelan victims.

Samuel Kye – White Havens and the Preservation of Segregation in the Contemporary Metropolis

The stunning rise of diverse neighborhoods, places, and metropolitan areas has been widely recognized as one of the most significant demographic trends over the past several decades. On its face, this would appear to suggest a promising shift towards a new era of residential integration. Yet research consistently shows that residential segregation continues to persist, and a broad range of scholarship likewise confirms that white flight remains prevalent. This suggests a puzzle lying at the intersection of diversity and segregation research: if residential diversity has surged, how and why does contemporary residential segregation persist? In this study, I argue that each of these trends can be reconciled through an underappreciated feature of contemporary U.S. metros: a growing number of white households residing in a fewer number of select, predominantly white communities. Through a series of descriptive and spatial analyses, I

demonstrate that these neighborhoods—"white havens"—allow diversity to surge in surrounding neighborhoods while simultaneously preserving segregation for neighborhoods with a swelling number of white households. The final analysis strongly suggests that, while they may have waned in number, predominantly white neighborhoods still retain widespread contemporary significance—both for white households and for broader patterns of segregation.

Yoojin Lee – COVID-19 pandemic overview at the county level in New England: by selected socio-economic characteristics, impact on Nursing Home residents.

As of May 23, 2020, Johns Hopkins University reported that, since January, about 5.5 million and 1.6 million Coronavirus disease 2019 (COVID-19) confirmed cases which resulted in 346 thousands and 98 thousands deaths in worldwide and in the United States., respectively. The pandemic of COVID-19 has changed everyone's everyday life dramatically, and the most susceptible group is older adults and/or with chronic underlying medical conditions, most of whom resides in nursing homes (NH).

This project explores spread of COVID-19 at the county level in New England and investigate incidence and mortality rate in association with the county level socio-economic characteristics (age, gender, race, poverty and health insurance) and size of NH facilities. The source data used are 1) COVID-19 county level data from New York Times repository, 2) American Community Survey (ACS) for county level characteristics, 3) the Certification and Survey Enhanced Reports (CASPER) for NH facility address and size, and 4) Census 2019 TIGER/Line Shape files. With respect to GIS application, this project will explore the visualization of ArcGIS (if feasible, trends over time) and how ArcGIS handles spatial analysis differently from other statistical software.

Subadevan Mahadevan – Informal settlements and urban service delivery access

How does place of residence matter for urban service delivery in the growing cities of the Global South? This study will use data from Open Street Maps, online government documents, and other secondary sources to study an Indian case – the city of Vijayawada in the state of Andhra Pradesh. It will map the distribution of informal settlements and assess their access to urban services such as schools, hospitals and public toilets, using distance as measure. The study will also seek to measure the discrepancy in access between informal settlements, setting the stage for preliminary observations and further fieldwork.

Rebecca Marisseau – Whaling City: A Spatial Analysis of Whale Fishery in 19th-Century New Bedford

Nineteenth-century New Bedford, Massachusetts was one of the most important ports in the world for trade in whale oil, spermaceti, and baleen, which were manufactured into everyday products like candle wax, lamp oil, and machine lubricants. This project conceives of New Bedford's "whale fishery" as a process and a network of relationships that extended well beyond when the oil casks left the ships, involving industries like coopering, rigging, and gauging. The project will map New Bedford's industries not only to see their distribution in space, but to begin to theorize the relationships between them in order to understand how the physical port shaped and was shaped by whale fishery.

Connor Staggs – Urban Religious Segregation and Public Service Access in India

In this project, I examine how the distribution of self-reported public services and utilities varies with the religious composition of neighborhoods in Indian cities. In particular, I examine variation in the presence and quality of services such as electricity, water, roads, and waste disposal within and across cities. Relying on extensive geospatial survey data, I hope to show how inequalities in access to public services discriminate against minority religious groups in the context in modern, urban India. I expect these effects to be more pronounced when members of minority groups are clustered together and do not live in more mixed environments.

Anabelle Suitor – Agrarian Change and Fishing Labor in Southeast Coastal and Deltaic Bangladesh

Bangladesh is one of the most densely populated and climate vulnerable countries in the world, and it has always been, long before climate change entered a global consciousness. This project will supplement my dissertation research, focusing on how climatic displacements and social antagonisms intersect in the port-city of Chittagong, Bangladesh. The project focuses on fishing communities in the city constituted of lower-caste resident Hindu fishers and climate-dislocated Muslim fishers from the mouth of the Meghna River, part of the largest Delta in the world; a place that is still grappling with legacies of some of the most severe environmental events. The Muslims of my study express a shift from agrarian labor to fishing labor, due to climatic dislocation. They are thus brought to co-inhabit and co-labor with lower-caste Hindus. I will use landsat images from 1999 to 2020 to explore long-term and seasonal ecological change in coastal and deltaic Southeastern Bangladesh - with focus on changes in vegetation coverage, water coverage, and water depth. This will be supplemented with information - through governmental and non-governmental surveys on changes in agriculture in these regions of Bangladesh, which I will map to the sub-district level. I have already conducted exploratory research, conducting a very small number of surveys with data of location of origin for many fishers in my fieldsite. I will georeference and digitize the information from these surveys. The mapping proponent of my project will serve to provide essential environmental context for the changes in labor practices in Chittagong, Bangladesh.

Kathryn Thompson – The effect of provider characteristics on antiretroviral therapy adherence and racial disparities among U.S. Medicaid beneficiaries

Tang poetry was a glorious achievement in the cultural history of the Tang dynasty (618-907AD) Established as the largest public health insurance program in the United States, the Medicaid program provides health coverage to millions of Americans including low-income adults, pregnant women, the elderly, children, and individuals with disabilities. In addition, the Medicaid program is the largest source of insurance coverage for people with HIV; providing reliable access to care, the ability to manage complications, and a consistent source of antiretroviral therapy. Previous literature recommends the use of antiretroviral therapy for HIV-positive women in order to reduce perinatal transmission of HIV and reduce the risk of adverse birth events such as stillbirth and prematurity. However, despite recommendations, the adherence to antiretroviral therapy (ART) is low among HIV-positive pregnant Medicaid beneficiaries. In addition to the lower rates of medication adherence, racial and ethnic disparities persist and are

exaggerated in this low-income, high risk population. It is unclear if provider characteristics (i.e. type and location) play a significant role in the maturation of these racial differences and their relationship to ART use. In this project, we will utilize twelve years of Medicaid Analytic eXtract (MAX) data to examine the relationship between racial disparities, ART use, providers of pre-natal and post-natal care. Utilizing inpatient Medicaid claims from the 14 states with highest prevalence of HIV, we will include HIV-positive women who delivered a live, stillborn, or premature infant between 2001-2012. Using hierarchical linear models, we will group adverse birth events by race within providers. This analytical method will allow us to analyze unobserved provider characteristics that affect adverse birth events within each category of specified race. Lastly, crude rates and 95% confidence intervals will be calculated for all outcome variables controlling for the following: age, neighborhood, health status, income, education, and coverage. We expect findings from this analysis will help to inform researchers, providers, and policymakers about the relationship between provider characteristics, ART uptake, and the disparities associated.

To determine why race and ethnicity is a persistent predictor of adverse birth outcomes and ART use in a high-risk, low-income population like Medicaid. We hypothesize that within the same zip code, pregnant women of Black and White race utilize different providers and deliver in characteristically different hospitals. We also state that due to this difference in provider characteristics between racial groups, Black Medicaid beneficiaries will have higher rates of stillbirth and prematurity.