

# **Spatial Structures in the Social Sciences 2016 Winter GIS Institute**

## **Final Presentation Program**

January 22, 2016 Population Studies and Training Center  
Seminar Room

<b>9:30 – 9:45 am</b>	<b>Welcome</b>
<b>9:45 – 11:00 am</b>	<b>Session I: Spatial Aspects of Human Behavior and Social Structures</b>
<b>11:00 am – 12:15 pm</b>	<b>Session II: Healthy in the State of Rhode Island</b>
<b>12:15 – 1:30 pm</b>	<b>Lunch</b>
<b>1:30 – 2:15 pm</b>	<b>Session III: Spatial Analysis and Health</b>
<b>2:15 – 3:45 pm</b>	<b>Session IV: Knowledge And Networks</b>
<b>3:45 – 4:00 pm</b>	<b>Certificate Presentation</b>
<b>4:00 pm</b>	<b>Close of Conference</b>

## **PARTICIPANTS**

**Emily Avera** (Anthropology)

**Aimée Bourassa** (Political Science)

**Anna Civitarese** (School of Public Health)

**Danilo Sales do Nascimento França** (Sociology)

**Leland Grigoli** (History)

**Clayton Kindred** (Public Affairs)

**Erica Kinias** (History of Art and Architecture)

**Chantal Lewis** (School of Public Health)

**Hannah Marshall** (Anthropology)

**Jerome Marston** (Political Science)

**Lindsay Orchowski** (Psychiatry and Human Behavior)

**Veronica Pacheco** (The John Carter Brown Library)

**Nithya Ramesh** (School of Public Health)

**Chloe Sarapas**

**Richard Snyder** (Political Science)

**Esha Sraboni** (Sociology)

**Chih Yun Angelica Teng** (School of Public Health)

**Siri Veland** (IBES)

**Kate Weinberger** (IBES/Epidemiology/Earth, Environmental, and Planetary Sciences)

**Amna Younus** (School of Public Health)

**Dan Zborover** (The John Carter Brown Library)

## **PROGRAM**

### **SESSION I:**

#### **SPATIAL ASPECTS OF HUMAN BEHAVIOR AND SOCIAL STRUCTURES**

**Esha Sraboni**, *A Spatial Examination of Nuptiality Patterns of Women in Bangladesh*

**Danilo S. N. França**, *Describing Residential Segregation by Race in São Paulo, Brazil*

**Aimée Bourassa**, *The Political Architecture of Social Housing*

**Hannah Marshall**, *Mapping Inadequacies in U.S. Government Anti-trafficking Strategy*

**Jerome Marston, Rebecca Martin, and Richard Snyder**, *Who is Safe? Unequal Citizen Security in Providence, Rhode Island*

### **SESSION II:**

#### **HEALTHY IN THE STATE OF RHODE ISLAND**

**Amna Younus**, *Possible Re-location Points for Needle Exchange Programs According to Socioeconomic Status in Rhode Island*

**Anna Civitarese**, *Increasing Condom Availability Amongst a Vulnerable, Untargeted Teenage Population in Rhode Island*

**Chantal Lewis**, *Getting Tested: A Spatial Analysis of Access to HIV Testing in Rhode Island*

**Chih Yung Angelica Teng**, *The State of Food Insecurity Affecting the Rhode Island Free Clinic Patient Population*

**Nithya Ramesh**, *An Analysis of the Effectiveness of the SEAL RI Program Conducted by the Rhode Island State Department of Health, 2014–2015*

**LUNCH BREAK, 12:15–1:30**

**SESSION III:  
SPATIAL ANALYSIS AND HEALTH**

**Kate Weinberger**, *Effect of Heat Warnings on Morbidity and Mortality Among Older Adults in the Northeastern United States*

**Emily Avera**, *Blood Safety in the African Region*

**Lindsay Orchowski and Chloe Sarapas**, *Neighborhood Characteristics as a Predictor of Actual and Perceived Norms Among High School Students*

**SESSION IV:  
KNOWLEDGE AND NETWORKS**

**Clayton Kindred**, *An Appointment in Samarra: Using GIS to Predict Iconoclastic Risk in Islamic State Occupied Lands*

**Siri Veland**, *Mapping Indigenous Knowledge*

**Danny Zborover**, *Indigenous Settlements, Paths, and Historical Mobility in Southern Mexico*

**Veronica Pacheco**, *Sacred Music and Networks in the Nahua Towns of Chicontepec, Mexico*

**Erica Kinias**, *Le Grand et le Petit: Using GIS Viewshed Analysis to Determine the Role of Visibility in 13th Century Alsace*

**Leland Grigoli**, *Ubi est thesaurus tuus, ibi est et cor tuum: Spatial and Network Analysis of the Monastic Cartulary*

## **PRESENTATION ABSTRACTS**

### **Emily Avera – Blood Safety in the African Region**

This project is a supplement to a forthcoming multi-sited ethnographic study of the social ramifications of blood safety (i.e. hemovigilance) and sustainability in South Africa. Fieldwork will be conducted in Cape Town and Johannesburg with two national blood services, blood safety NGOs, and a public hospital. For the GIS supplement, my project will examine the context of broader World Health Organization (WHO) data on blood safety in the African region (cf. Tapko et al 2009; Tapko et al 2014). The WHO data from these two reports outline the results of consecutive surveys from 46 African countries' blood services regarding blood safety in their countries. The scope of the institute project is to ask if there are sub-regional variations in blood safety or country-specific trends in blood supply management and what blood safety factors have changed between the two survey periods. This will serve as a snapshot to understand the region more broadly with regard to blood safety, and how this may inform initiatives to improve blood safety in the region. This will be especially useful in my future collaboration with NGO's based in South Africa which are actively working on providing tools for blood safety improvement in the countries in the region beyond South Africa, which already has world-class blood safety capability. In addition, the project may also include some preliminary information about the location (available as latitude/longitude coordinates) of fixed blood donor centres in South Africa in relation to the spatial distribution and/or provincial/municipal counts of key factors that may have informed the establishment of these fixed blood donation sites (e.g crime rates, proximity to other medical resources, proximity to large population areas with high income) and accessibility to these fixed centers based on available figures from South Africa census and *Statistics South Africa*.

### **Aimée Bourassa – The Political Architecture of Social Housing**

This research project examines the partisan and electoral determinants of social housing and infrastructure provision in Latin America. Housing informality both symptomizes and contributes to urban poverty and marginalization, and Latin American cities are among the most unequal in the world. Urban development, if done without consideration for human development, will thus leave increasing portions of the population living in poverty and marginality. Yet, governments' policy answers to the issue of housing informality have varied greatly across countries, within countries, and over time, ranging from building social interest housing to subsidizing mortgages. In this context, what explains variation in housing policy? Why do politicians sometimes opt to build new housing, renovate, or demolish shantytowns? Situating housing in the broader literature on distributive politics, with its preoccupation with who benefits from government policies and how structural and institutional incentives shape distributive strategies, this project argues that certain types of infrastructure and housing policies are more likely to emerge given certain political incentives relating to the electoral geography and the targeting of core versus swing constituencies. Using data on housing benefits in Mexico for 2015, it uses spatial analysis to explore differences between policy instruments that are permanent or enduring as opposed to revocable, and territorially bounded versus unbounded.

### **Anna Civitarese – Increasing Condom Availability Amongst a Vulnerable, Untargeted Teenage Population in Rhode Island**

The Rhode Island Department of Health, Division of Preparedness, Response, Infectious Disease, and Emergency Medical Services (PRIDEMS) directs a condom distribution program in which over fifty different agencies (including include universities, substance abuse facilities, counseling centers, MSM bars/clubs, and counseling, treatment, and referral centers) may request state-funded condoms and condom dispensers for their locations. While the locations of these dispensers increase access of condoms to specific high-risk populations, the location of these dispensers in predominantly adult venues is likely sub-optimal for reaching another high-risk group: 15-19 year old youth. In 2013, via the Rhode Island Youth Risk Behavior, it was determined that 32% of students had had sex without a condom, and 27% were currently sexually active. In this manner, it is of concern of PRIDEMS to increase access to condoms for this group to prevent the spread of chlamydia and other sexually transmitted infections in this population. Therefore, we seek to identify community-based locations that are geographically proximal to high schools in the areas with the highest rates of chlamydia. The goal of this project is to assess current access of condoms distributed by PRIDEMS; investigate current disparities in access; target potential locations in high morbidity areas in which condom dispensers could be placed; and generate recommendations on the most appropriate course of action for introducing condom dispensers into the community to increase access for 15-19 year old youth.

### **Danilo S. N. França – Describing Residential Segregation by Race in São Paulo, Brazil**

Despite the large racial inequalities in Brazil, relations between blacks and whites in this country are often described as having high proximity and mixing. Thus, research on race relations in Brazil have given little importance to segregation. Since this context, the main objective of my research is to propose an interpretation about the significance of residential segregation for race relations in Brazil. In order to accomplish this, my first task aims to describe the patterns of racial segregation in São Paulo, the largest Brazilian metropolitan region, by recent census data. The preliminary results indicate mild levels of residential segregation between blacks and whites in lower classes. These levels become increasingly sharper in middle and higher classes. The presentation will focus on the differences in residential patterns and possibilities of access to city resources to these groups of blacks and whites in these social classes. Finally, I intend to use the spatialized data to discuss how residential segregation could matter to well-to-do groups.

### **Leland Grigoli – *Ubi est thesaurus tuus, ibi est et cor tuum*: Spatial and Network Analysis of the Monastic Cartulary**

The use of monastic foundations in the *mise en valeur des terres* is a phenomenon well established in medieval scholarship. Monasteries and their granges organized the cultivation of vast tracts of territories, and the obvious piety of the monks checked the violent excesses of feudal lords. This historical phenomenon has in been studied in its various manifestations, but such studies are almost universally conducted in isolation, focusing on one foundation or region. Yet we have long recognized that, by the first years of the second millennium, monastic orders were international, pan-European institutions. Monks seeking to set the lands about them in order were able to draw on a variety of experiences and practices. To address this scholarly lacuna, this study offers the first step towards a comparative understanding of monastic practices. Extracting information from a surviving collection of title deeds and other legal documents from the northern French monastery of Foigny, it will offer a new look at the relationship between lay

lords, peasants, monks, and the lands they occupied. This study will also serve as a case study for a larger, comparative study of monastic practices in forming social and physical networks, enabling us to see how practices first used to subdue the "bad habits" of the northern nobility could be applied to Muslim territory in Spain and the heretics of the Languedoc.

### **Clayton Kindred – An Appointment in Samarra: Using GIS to Predict Iconoclastic Risk in Islamic State Occupied Lands**

Recent attacks on art objects and archaeological sites by the Islamic State (ISIS) have called into question the group's motive, and overall ideology towards iconoclasm – the destruction of heritage objects or sites for theopolitical purposes. Employed for varying social, economic and governmental purposes, the Islamic State's brand of iconoclasm is both unique and pervasive in that it seems to exist in the interstitial space between a soft and hard power of war. Accordingly, predicting how and when the Islamic State will next use iconoclasm is often impossible.

As such, my project will analyze the geographic and social space surrounding occurrences of iconoclasm in Iraq and Syria, with the aim of determining that certain predictive markers of iconoclasm exist. Furthermore, from this analysis, I will construct an "iconoclasm index" in which I will examine the prevalence of these predicative markers at heritage sites in other Islamic State occupied areas (such as Egypt and Libya), so that some measure of the iconoclastic risk to these objects and sites, may be established.

### **Erica Kinias – Le Grand et le Petit: Using GIS Viewshed Analysis to Determine the Role of Visibility in 13th Century Alsace**

The history of Alsace, in present-day eastern France, is inextricably linked with its geography. The story of three medieval castles, the Château du Grand-Geroldseck, Château du Petit-Geroldseck, and the Château de Hohbarrbuilt, built just south of the town of Saverne in central Alsace, and constructed within 1,000 meters to one another, reflect the contentious relationship between political control of the region and its strategic location overlooking the Saverne Pass on the northernmost tip of the Vosges mountains. While the castles' history has been well-documented by scholars, little work has been done on using GIS viewshed of medieval structures across the dramatic geography of Alsace. This study examines the effectiveness of the use of GIS viewsheds as a tool in the study of medieval castles by examining visibility of and from these structures. This analysis is a case study of a more comprehensive study of medieval castles of Alsace using GIS viewshed to establish how visibility served as a determining factor in site selection for defensive structures.

### **Chantal Lewis – Getting Tested: A Spatial Analysis of Access to HIV Testing in Rhode Island**

Non-adherence to HIV care is a significant public health concern. In the US, the government has mandated that those who have received a positive test, must enter the HIV care continuum immediately. However, 1 in 6 Americans are unaware their HIV status. Since a HIV test is the most definitive way of identifying whether or not a person has the disease, HIV testing is a crucial step. In fact, the untested population poses a huge public health threat because these individuals are at increased risk of rapid progression to AIDS as well as transmitting the disease. In recent months, Rhode Island has seen approximately 20% increase in the incidence of HIV which raised concerns among state officials about spread of the disease. The issue of getting testing is further complicated by a myriad of factors, most of which are a part of complex webs

of human behavior and cultural norms. The most salient of these factors however, involves the accessibility to HIV testing sites- particularly free testing sites. The accessibility of healthcare in terms of the geographic location and spatial distribution of health services are important factors in healthcare utilization. In this paper, I will map the location of HIV-related testing services and use exploratory spatial data analysis to visualize and examine the distribution of HIV testing service providers. In examining the location of HIV service providers I will map the minimum distance to the nearest service provider. I do anticipate some services to be evenly distributed throughout the state. However, some services I anticipate will be clustered around densely populated regions- resulting in poor access for some individuals. It is also my goal will be to inform policy makers and researchers about the need to integrate spatial analysis techniques in their analysis and subsequent decision in making HIV-related services accessible in the state.

### **Hannah Marshall – Mapping Inadequacies in U.S. Government Anti-trafficking Strategy**

Programs designed to identify and combat sex trafficking are a growing and controversial component of US federal spending. While an unlikely alliance of radical feminists and evangelical Christians (often referred to as 'abolitionists') have pushed for increased federal funding for what they view as a rising threat of forced sexual exploitation, many human rights activists and scholars have spoken out against the governments' escalating anti-trafficking initiatives. In particular, human rights activists and academics emphasize the disproportional relationship between the significant amounts of funding directed towards addressing sex trafficking, and the extremely small numbers of identified victims. Furthermore, these actors have argued that anti-sex trafficking policy and practice frequently creates negative effects including the unnecessary policing of migrant women, and the compromising of sex worker safety. Here I examine the state of anti-trafficking initiatives across the USA, close to two decades after the passing of the cornerstone of US anti-trafficking legislation: The Trafficking and Victims Protection Act. In particular, I will explore whether states have been able to translate increased federal funding into improved victim identification, and how states' sociolegal climates, for example numbers of prostitution arrests, impact the success of their anti-trafficking initiatives. I hope to demonstrate current inadequacies in the US's anti-trafficking strategy, and open a space for discussion regarding future reform.

### **Jerome Marston, Rebecca Martin, and Richard Snyder – Who is Safe? Unequal Citizen Security in Providence, Rhode Island**

Thousands of violent crimes are committed each year in Providence, RI. Yet these crimes are not distributed evenly across the city: in 2007, for example, a resident of the high-crime Lower South Providence neighborhood was fifty times more likely to be the victim of a murder, rape, robbery or aggravated assault than a resident living just two miles away in the low-crime Blackstone or Wayland neighborhoods. Using ArcGIS, we explore data from the Providence Police Department on crimes committed between 2006 and 2015 to map neighborhood-level patterns in rates and types of crime. We also focus on how spatial proximity both to Providence and University police stations affects crime rates. Does the spatial distribution of policing lead to public safety "deserts," that is, areas of high crime and attenuated policing, or, alternatively, to public safety "oases," that is, areas of low crime and robust policing?

### **Lindsay Orchowski and Chloe Sarapas – Neighborhood Characteristics as a Predictor of Actual and Perceived Norms Among High School Students**



It is well documented that college students overestimate how much other students drink (i.e., Borsari & Carey, 2001; Perkins & Berkowitz, 1996). Likewise, students tend to believe that others are more sexually active than they actually are (Page, Hammermeister, & Scanlan, 2000), and more supportive of violence than is actually the case (Bruce, 2002; Fabiano, Perkins, Berkowitz, Likenbach & Stark, 2003; Kilmartin et al., 1999). These misperceptions can increase pressure to engage in sexual activity (Prinstein, Meade, Cohen, 2002) and decrease the likelihood of engaging in bystander intervention (Berkowitz, 2002; Orchowski, Berkowitz, Boggis & Oesterle, 2011). Accordingly, sexual assault prevention experts have called for the application of social norms marketing to provide accurate data on student attitudes and behaviors regarding violence; with the assumption that this information would correct the misperceptions of peer norms, and lessen the normative pressure to engage in sexual violence or condone its occurrence (Perkins et al., 2005).

In our current CDC-funded evaluations of social norms marketing as a prevention strategy for sexual violence in high schools and middle schools in Rhode Island, we aim to: 1) evaluate efficacy of intervention; 2) conduct secondary analyses to document the factors that shape social norms regarding sexual violence; and 3) examine moderators of intervention efficacy. Drawing on prior research suggesting that the density of alcohol outlets moderates the effectiveness of social norms marketing addressing alcohol on college campuses (Scribner et al., 2011), it is feasible that the characteristics of neighborhoods surrounding high schools play a role in establishing student norms regarding sexual violence. If this is the case, neighborhood characteristics may influence the efficacy of social norms marketing to prevent sexual violence in a given school. The present analysis aims to establish a basis for examining neighborhood characteristics as a moderator of the efficacy of social norms marketing among high schools. Specifically, the present study utilized geospatial coding to determine the density of alcohol outlets, strip clubs, and violence-related resource centers in the communities near high schools in Rhode Island. Utilizing data from our research with 12 Rhode Island high schools (N=2400), we then tested utilizing multi-level modeling and a multiple record dataset whether the density of these neighborhood characteristics was associated with actual and perceived norms regarding sexual violence among students.

### **Veronica Pacheco – Sacred Music and Networks in the Nahua Towns of Chicontepec, Mexico**

In the Nahua indigenous towns of Northern Veracruz, Mexico, Catholic, Evangelical, and Nahua ritual musical intersect in the public spaces. The active engagement of the inhabitants of these settlements with ceremonies associated with the agricultural cycle creates a network of musicians, some of whom arrive from distant villages to perform in ceremonial centers, such as mountains and water sources. Tracing the musicians' networks with GIS will aid to map ceremonial centers and peripheries and examine the dynamics of the existing musical practices in the area.

### **Nithya Ramesh – An Analysis of the Effectiveness of the SEAL RI Program Conducted by the Rhode Island State Department of Health, 2014–2015**

SEAL RI is a Rhode Island State Department of Health initiative in collaboration with Rhode Island community organisations that provides free preventive dental treatment services to school children in the public school system. As a part of the evaluation conducted by the Oral Epidemiology department of the DOH, I examine the population being covered by this program

and the effectiveness of the initiative. We would like to determine if the free services are being provided to the population that most requires it and the data being analysed is for the academic year 2014-2015. Data from the previous year shows that there is uneven distribution of treatment services provided in the different school districts and measures were taken to bridge this gap. Analysis of the current year's data will reveal the effectiveness of these measures and help improve future implementation of the program.

### **Esha Sraboni – A Spatial Examination of Nuptiality Patterns of Women in Bangladesh**

This project aims to examine spatial patterns in marriage, more specifically age at first marriage, for women in Bangladesh using the nationally representative Bangladesh Demographic and Health Survey of 2011. I plan to map marriage patterns across the seven administrative divisions of Bangladesh. In line with existing literature that documents the positive association between age at marriage and “modernization” (urbanization, increasing levels of income and education, etc.), I hypothesize that marriage patterns will differ between rural and urban areas, and across different levels of education for women. The literature also notes the health implications of timing of first marriage; women who marry in their teenage years tend to have more children and bear children earlier than their adult peers, and are more likely to suffer from health complications. Following this, I hypothesize that the mean number of children born to women and the incidence of malnutrition (proxied by body mass index) will be lower in regions where women delay their marriage.

### **Chih Yung Angelica Teng – The State of Food Insecurity Affecting the Rhode Island Free Clinic Patient Population**

With obesity and diabetes on the rise in the United States, more research efforts have been made to pinpoint its cause. But beyond biological explanations alone, the disproportionate cases in patients of color and those belonging to lower income tiers has repeatedly emphasized that many of the causes are more socioeconomic in nature - where accessibility, affordability, and quality of food resources to a community must be taken into account. Aware that many of their patient zip-codes overlap with areas designated as food deserts by the USDA GIS data reports, the Rhode Island Free Clinic (RIFC) has begun looking into prospective community partnerships to increase patient access to fresh fruits and vegetables. During this preliminary stage of project planning, arcGIS maps will be used to examine the state of need and the network of resources available to their patient population. The maps will provide a dimension of spatial relation to the ethnic and socio-economic demographics of the patient populations. Grocery stores, corner stores, farmers markets, and food pantry resources that fall within the top 10 of the zip -code blocks with the highest density of RIFC patients will be overlaid to show the spread of available food resources. Additional layers examining transportation routes and percent receiving SNAP benefits will then be used to evaluate facility of access to these resources. Not only will this geo-data provide a preliminary survey of how the patient population relates to the “food desert” of Rhode Island, it is possible that the evaluation of these resources’ facility of access and weekly hours may pinpoint areas in need that may be targeted by the prospective community health project.

### **Siri Veland – Mapping Indigenous Knowledge**

This presentation introduces key issues in mapping Indigenous Australian knowledge and relationships to land- and seascapes using GIS and other mapping tools. GIS databases are

constructed through ‘ontologies’ that comprise categorized labels that represent lived contexts. These ontologies are arrived upon through shared understanding of the basic building blocks of spatial phenomena (e.g. water, land, grassland, forest) for representation in GIS databases. Research with Indigenous Australians shows basic ontological categories are often incommensurable with non-Indigenous categories, which severely challenges cross-cultural understanding. In policy and governance, these challenges translate into miscues in land rights agreements, resource management, or in efforts to achieve human dignity. In this project, particular care is therefore taken to ensure cultural knowledge is entered into the database, analyzed, and presented in ways that are respectful of Indigenous methodologies and epistemologies. The presentation draws on two mapping exercises, one displaying how GIS can display ongoing relationships with ‘ice age geography’ in Northern Australia, the other showing how GIS helps represent cultural knowledge and presence in the Murray-Darling Basin of Australia. I describe some steps in the construction of a GIS database and an associated intellectual property rights agreement, made between the Indigenous Australian Yorta Yorta Nation and researchers at Brown University.

### **Kate Weinberger – Effect of Heat Warnings on Morbidity and Mortality Among Older Adults in the Northeastern United States**

Exposure to extreme heat is associated with an increased risk of death, as well as with increases in emergency department visits and hospitalizations for respiratory and cardiovascular diseases. The elderly are especially vulnerable to episodes of extreme heat. To prepare communities in the United States for such episodes, local offices of the National Weather Service issue heat warnings when the heat index is predicted to exceed a predetermined threshold. While the relationship between heat and human health has been extensively studied, the effectiveness of heat warnings in terms of lives saved and illnesses avoided is largely unknown. Accordingly, we propose to (1) evaluate the effect of heat warnings on deaths and hospitalizations among Medicare beneficiaries across the northeastern United States between 2001 and 2012, and (2) identify characteristics of individuals and the surrounding built environment that modify warning effectiveness. Such an assessment is timely in light of projected increases in the frequency and severity of heat waves due to climate change.

### **Amna Younus – Possible Re-location Points for Needle Exchange Programs According to Socioeconomic Status in Rhode Island**

My project will be focusing on the current locations of the Needle Exchange Programs in Rhode Island. This social service provides drug users with fresh syringes to prevent re-use of needles, further reducing the spread of diseases spread through this route such as HIV and Hepatitis. My analysis involves sorting the state according to socioeconomic status and evaluating whether the current locations of the program are sufficient or is there a gap. The project will later also be used to assess the efficiency of the program in HIV endemic areas. Pharmacies selling over the counter syringes will then be added to the map as they maybe contributing to the cause in other areas. This project is in collaboration with the Rhode Island Department of Health.

### **Danny Zborover – Indigenous Settlements, Paths, and Historical Mobility in Southern Mexico**

This research presentation will focus on southern Mexico, where the historical displacement and relocation of indigenous communities shaped the contemporary settlement pattern. By using

digital and fieldwork-collected geographical data and applying GIS tools to model cost surfaces and create 'least-cost paths' between the highlands and the coast, I will attempt to reconstruct how and why people collectively mobilized about these spatial and temporal landscapes.