

Spatial Structures in the Social Sciences 2013 Winter GIS Institute

Final Presentation Program

January 18, 2013 Population Studies and Training Center, Seminar Room

9:30 – 9:45 am	Welcome
9:45 – 10:45 am	Session I: Food, Alcohol, and GIS
10:45 am – 12:00 pm	Session II: Spatial Analysis of Health and Wellbeing
12:00 – 1:00 pm	Lunch
1:00 – 1:45 pm	Session III: Geography and HIV
1:45 – 3:15 pm	Session IV: Spatial Perspectives on the Social and Physical World
3:15 – 4:00 pm	Session V: Historical Geography
4:00 – 4:45 pm	Session VI: Geography and Education
4:45 – 5:00 pm	Certificate Presentation
5:00 pm	Close of Conference

PARTICIPANTS

Justin Batcheller (Public Health)

Akilah Dulin-Keita (Public Health)

Kate Ellis (Center for Statistical Sciences)

Jon Ericson (Cognitive, Linguistic, and Psychological Sciences)

Elena Esposito (Economics, Visiting Student)

Kerri Hayes (BioMed)

Scott Hewitt (BioMed)

Alexis Jackson (History of Art)

Carole Jenny (Medical School)

Dawn King (Center for Environmental Studies)

Natalie Kissoon (Bio-Med Pediatrics)

Rebecca Loya (Public Policy)

Cindy Lung (Education)

Chenelle Norman (Public Health)

Apollonya Porcelli (Sociology)

Marissa Reitsma (Molecular Microbiology)

Rachel Scagos (Public Health)

Dantrell Simmons (Medical School)

Julia Troche (Egyptology)

Michelle Un (Swearer Center)

Yashas Vaidya (Sociology)

Meghan Wilson (Political Science)

Di Wu (American Studies)

Shuo Yang (Geology)

Annajane Yolken (Medical School)

PROGRAM

SESSION I: FOOD, ALCOHOL, AND GIS

M. Dawn King, *Localizing the Food System: Kitchen Incubator Use in Rhode Island and Massachusetts*

Akilah Dulin-Keita, *Neighborhoods and Diet: Potential Moderating Effects of a Fruit and Vegetable Intervention on Dietary Quality among Residents of Subsidized Housing*

Natalie Kissoon, *Alcohol Availability in Rhode Island Neighborhoods*

Kerri Hayes, *A Preliminary Examination of the Association Between Alcohol Outlet Location and Adolescent Drinking in Eight Rhode Island Communities*

SESSION II: SPATIAL ANALYSIS OF HEALTH AND WELLBEING

Scott Hewitt, *Utilization of Hospital Services among an Economically Vulnerable Population: A Geo-Spatial Analysis*

Chenelle Norman, *Utilizing Spatial Data to Explore which Pediatric Offices in Rhode Island to Target when Introducing a Child Passenger Safety Pilot Program*

Rachel Scagos, *Using GIS to Examine Characteristics of Those Currently Being Served by the RI Department of Health's Living Well Rhode Island Program and to Explore where to Implement More Program Locations*

Rebecca Loya, *Spatial Distribution of Rape Crisis Services in Massachusetts*

Yashas Vaidya, *Role of Space in Social Determination of Health: Spatial Patterns in Incidence of Child Anemia in Nepal*

SESSION III: GEOGRAPHY AND HIV

Annajane Yolken, *Do One Thing: Mapping a Geographically-Based HIV and Hepatitis C Outreach, Testing, and Treatment Campaign*

Marissa Reitsma, *Structural Risk Factors and HIV Prevalence in Rhode Island*

Dantrell Simmons, *HIV Testing and Prevention Social Marketing: Identifying High-Risk Areas and Community Stakeholders*

**SESSION IV:
SPATIAL PERSPECTIVES ON THE SOCIAL AND PHYSICAL WORLD**

Justin Batcheller, *A Spatial and Temporal Analysis of Oncomelania quadrasi Snail Colonies and their Association with the Presence of Schistosoma japonicum in Fifty Villages in Western Samar Province, Philippines*

Elena Esposito, *Climatological Shocks and Civil Conflict Onset in Sub-Saharan Africa*

Apollonya Porcelli, *Demographic Composition in the Presence of Hydroelectric Dams in Altamira, Brazil*

Kate Ellis, *Informalization of Income-Generating Activities: Margins, Spatial Conditions, and Economic Consequences in New York City and Greater Accra, Ghana*

Shuo Yang, *Inferences about the Paleoclimate Reconstruction from Isotope Signature of Eastern Equatorial Pacific Surface Waters based on Alkenone-Specific Hydrogen Isotopes*

Jon Ericson, *Be My Neighbor: Urban Network Analysis of Buildings and Streets in Providence and Cambridge*

**SESSION V:
HISTORICAL GEOGRAPHY**

Di Wu, *Family Tree of Wu and the Chinese Urbanization*

Julia Troche, *Middle Kingdom Abydos: Use of Space and the Memory of Place*

Alexis Jackson, *Mapping the Medieval Hospital: Challenges and Potential*

**SESSION VI:
GEOGRAPHY AND EDUCATION**

Cindy Lung, *Spatial Analysis of Public Schools and Neighborhood Crime in Providence in 2011*

Meghan Wilson, *The Renaissance of Education: Shifts in Public Opinion Due to Emergence of Educational Choice in Detroit*

Michelle Un, *Neighborhood Effects on College Participation Outcomes in Providence, RI*

PRESENTATION ABSTRACTS

Justin Batcheller – A Spatial and Temporal Analysis of *Oncomelania quadrasi* Snail Colonies and their Association with the Presence of *Schistosoma japonicum* in Fifty Villages in Western Samar Province, Philippines

Two surveys were conducted in the Western Samar province, encompassing 50 villages and the surrounding riparian and freshwater ecosystems. The first survey measured *Schistosoma japonicum* egg counts in multiple stool samples from 5623 humans to determine infection level. Presence of snail colonies was surveyed along streams, springs, various canals and swampy areas or grass land. Out of the 845 sites surveyed, a sufficient number of *O. quadrasi* snails were identified in 147 sites to measure density and infection. A mass-treatment regimen followed the survey in all 50 villages, and several years later, a second follow-up study was conducted to measure the same variables, human infection and snail distribution. This project aims to depict these data spatially, in an attempt to highlight any trends connecting snail population distribution, density, and infection to human infection and severity of symptoms.

Akilah Dulin-Keita – Neighborhoods and Diet: Potential Moderating Effects of a Fruit and Vegetable Intervention on Dietary Quality among Residents of Subsidized Housing

Social cognitive theory posits that fruit and vegetable intake is negatively affected by poor neighborhood social, environmental, political and economic conditions. This suggests that community efforts to reduce neighborhood barriers may directly translate into promotion and adoption of healthier dietary behaviors. While certain neighborhood factors such as economic context are difficult to change without significant policy intervention, it is plausible that social interventions designed to increase intake of fruits and vegetables may be a way to overcome barriers associated with neighborhood effects on diet quality. To examine longitudinally whether a fruit and vegetable intervention delivery system to low-income public housing sites at subsidized cost, moderates the effects of neighborhood economic deprivation on fruit and vegetable intake among public housing residents in Rhode Island. We will obtain U.S. Census Block Group level indicators of neighborhood socio-economic status (median household income, percentage of households with interest, dividend or rental income, median value of housing units, percentage of persons 25 or over with complete high school, percentage persons 25 or over with complete college, and percentage persons in executive, managerial, or professional specialty occupations) to create the summary index of neighborhood deprivation by Diez-Roux et al. Using ArcGIS, we will geocode participant addresses and create Choropleth maps to visually identify economic deprivation across Block Groups where the public housing residents reside.

Kate Ellis – Informalization of Income-Generating Activities: Margins, Spatial Conditions, and Economic Consequences in New York City and Greater Accra, Ghana

Informal economies are made up of unregulated micro-level transactions, markets, and networks – all remunerated in cash transfers – and all collectively shoring up a labor supply that would otherwise be participating in formally regulated economic enterprises. Development theories in the field of global political economy traditionally undervalue the weight of informal markets in modern industrialized economies; however, over time and across boundaries, the scale of informal economic activities, profit, and labor supply has in fact expanded in size and scope in urban regions, irrespective of the stage of the particular country's development. One private sector study on informalization in the U.S. "identified an informal economy of \$4.4 billion in

over one hundred urban neighborhoods across the nation” (Aldersdale et al. 2006). Because of the undocumented nature of these markets, current projections of the dispersion, directions, and dynamics of informalization are difficult to trace and attribute to one given variable, limiting policy options for public administrators and economic institutions. We do, however, have several socio-economic and business entity-related causes and indicators of informal markets (a relatively unobservable variable on its own) to support spatial analyses. Questions in this study include: Do these informal market attributes cluster in particular urban spaces? Can these attributes reflect correlations between observed informal economic activity as studied over time (2000 and 2010)? And are the spatial patterns of informal market attributes in one competitive metropolitan area (New York City) comparable to patterns in a much less developed area (Greater Accra, Ghana)?

Reference: Aldersdale, J., Talmage, J., Feeman, Y. 2006. Measuring the informal economy – one neighborhood at a time. A discussion paper prepared for The Brookings Institution Metropolitan Policy Program. Brookings Institute: Washington, D.C. p. 19.

Jon Ericson – Be My Neighbor: Urban Network Analysis of Buildings and Streets in Providence and Cambridge

The Urban Network Analysis (UNA) Toolbox developed by MIT's City Form Lab can be used to conduct computationally demanding graph analyses of complex spatial networks like city streets. Whereas most graph analyses only allow for edges (streets) and nodes (intersections), UNA allows for analyses of individual buildings or other points within the network. For example, unique measures of accessibility can be computed for two buildings on the same street, and these measures can be conducted with respect to every other building in the entire city network. This yields spatial metrics that can be used to determine which buildings in the city are most easily accessed from all other buildings in the city, for example. These metrics can then be used to determine the optimal locations for resource allocation given a variable of interest. This project reports some basic UNA analyses for Cambridge, MA, and Providence, RI.

Elena Esposito – Climatological Shocks and Civil Conflict Onset in Sub-Saharan Africa

A strong cross-country correlation between poverty and civil conflicts has been highlighted in the literature. Going beyond simple cross-sectional correlations, Miguel et al. (2004) showed that rainfall shocks are related to cross country conflict incidence. Along these lines, this project aims at exploring the impact of climatological shocks on conflict's onset in Sub-Saharan Africa. By exploiting disaggregated time-varying spatial data, we aim at shedding further light over the channels linking climatic shocks to conflicts. The idea of the project is to exploit available geographical disaggregated data on conflicts and climatological shocks, leading a disaggregated analysis through time. Our units of interest will be artificial squared cells of 1 degree per 1 degree, as sketched in the figure below. The dependent variable will be the total number of conflicts registered yearly in each squared cell. As explanatory variables, we will explore the role of precipitation and temperature. Note that we will collect data over the monthly average precipitation, temperature etc... (and not yearly average), since climatological shocks may matter only in certain months, i.e. during the growing season. Relying on squared cells will allow us to overcome the endogeneity of country boundaries, and to control for all country level observables and unobservables characteristics. Moreover, the empirical analysis will mainly exploit yearly variation in conflict incidence, thus getting rid of time-invariant cell specific characteristics.

Kerri Hayes – A Preliminary Examination of the Association Between Alcohol Outlet Location and Adolescent Drinking in Eight Rhode Island Communities

Underage drinking is a significant public health problem. Early onset of alcohol use is associated with increased risk of short- and long-term adverse outcomes and can interfere with the cognitive and social development necessary for healthy functioning. Despite our knowledge of these negative consequences, research has yet to fully characterize the early course of alcohol involvement. Project iSay (Internet Surveys about You) is a study designed to examine the milestones to early drinking utilizing frequent assessments with middle school students. The protocol combination of a relatively young sample coupled with monthly assessments is aimed to capture an individual's first drinking experience as it happens, allowing for a fine grained study of the circumstances that surrounded that experience. One important factor to consider in this investigation is the environment in which individuals are living. The proximity of home to alcohol outlets and the association to perceived availability of alcohol and other drugs, occurrence of alcohol consumption, and the source of the alcohol consumed will be examined.

Scott Hewitt – Utilization of Hospital Services among an Economically Vulnerable Population: A Geo-Spatial Analysis

The field of primary care research has become increasingly focused on improving health outcomes while lowering overall health care costs in response to the cost-outcome disparity that characterizes the U.S. healthcare system. While most of these efforts have examined health delivery within the confines of practice walls, it is clear that a population level approach is needed to fully appreciate primary care systems.

The objective of this study is to explore the geographic distribution of utilization of a community hospital among an economically vulnerable population of patients, which includes uninsured patients and those with Medicare/Medicaid. The primary aim of the study is to identify geographic areas with dense utilization by this population within the hospital's patient catchment area. Secondary aims are to explore how proximity to primary, urgent and hospital care influences hospital utilization. Results from such an analysis may be used to focus future research efforts and community based health interventions.

Alexis Jackson – Mapping the Medieval Hospital: Challenges and Potential

Geographic Information Systems provide an opportunity to reconstruction a spatial abstraction of the medieval world, which can help to illuminate various subjects of interest for medievalists. This project approaches a specific element of the topography of medieval English society: the hospital. The medieval hospital was a fundamentally different type of institution than the modern conception. The hospital, a religious institution primarily funded by pious private donors, played an important role in the social landscape of medieval England, and Christian Europe more broadly. There have been few previous attempts to map medieval hospitals on a large scale and consequently, spatial questions have gone mostly overlooked. Thus, GIS offers exciting new insights in researching the phenomena of the sudden emergence of hospitals in England following the Norman Conquest. This presentation will examine the mapping of a set of medieval hospitals in Yorkshire, England, founded between the mid-11th century and 1500 (from the Norman Conquest to shortly before the Henry VIII's Dissolution of the Monasteries, which saw most hospitals suppressed). In the Middle Ages, hospitals serve as one metric of urbanization. As such, mapping hospitals using GIS provides a way of asking spatial questions

about the nature of towns, cities, and the concept of “urbanness”, as well as questions about death, religion, and services related to medieval hospitals. This presentation will also address the challenges of forging a project with missing, uncertain, and/or largely qualitative archival data, as well as the potential for further research. While this project focuses on the aspect of hospitals and their place in the social topography of the medieval world, it could be greatly enriched and expanded with other elements of medieval existence, such as roads, monasteries, sites of pilgrimage, and fortifications.

M. Dawn King – Localizing the Food System: Kitchen Incubator Use in Rhode Island and Massachusetts

Providence only has a 3 day supply of food on any given day. Food is often overlooked as an important component of our national security, yet it is necessary for human survival. While the United States is a top agricultural producer, the food system is almost completely reliant on a dwindling fossil fuel supply. Further, only 2% of our cropland is used for fruits and vegetables while corn, soy, and hay for non-human consumption make up 65%. One way to better secure our food system, while simultaneously providing more access to fruits and vegetables, is to invest in the localization of the food system. Many markets and institutions emerged over the last decade to help support the growing demand for local food, but farmers face many obstacles in providing that food. One such obstacle is the difficulty in scaling-up to value-added goods, such as jams and sauces, due to budgetary and time restraints. A newer institution, the kitchen incubator, is trying to bridge the gap between supply and demand by providing shared-use, licensed kitchen space to early-stage, local food businesses. This project explores the demographics of small businesses using these incubators, with a focus on income level, rural users, and distance travelled based on business type. These findings may be useful to suggest locations for future incubator projects, as well as provide insight into their potential to spur small businesses growth in depressed communities.

Natalie Kissoon – Alcohol Availability in Rhode Island Neighborhoods

Alcohol abuse has been associated with many aspects of society including poverty, crime and child maltreatment. Research has shown that there are populations who are prone to alcohol abuse. The question of whether there are factors within a population which predisposes them to alcohol abuse is interesting. Also of interest, is what role the availability of alcohol plays in alcohol abuse. This project will explore the availability of alcohol in Rhode Island and its relationship with population characteristics.

Rebecca Loya – Spatial Distribution of Rape Crisis Services in Massachusetts

Nearly one in five women in the U.S. has experienced rape or attempted rape, adding up to an estimated 22 million survivors nationwide. Rape crisis services, such as medical attention, counseling, and advocacy, can be important to survivors’ recovery, yet not all survivors have access to these services. Research suggests that survivors of color and immigrants, particularly those who have low income, face numerous barriers to receiving culturally and linguistically appropriate rape crisis services. One barrier that is often cited is the dearth of appropriate services in low-income and racially segregated neighborhoods; however, few studies have documented the spatial location of these services. This project examines the spatial distribution of state-funded rape crisis centers in Massachusetts, relative to neighborhood income and racial composition. This project begins to answer these questions: Are rape crisis services equally

available to residents of lower- and higher-income neighborhoods? Are these services located in or near communities of color? How accessible are these services using public transportation? These findings offer insight about whether existing state-funded services are available to all neighborhoods in the Commonwealth, and whether public policy attention is needed in this area.

Cindy Lung – Spatial Analysis of Public Schools and Neighborhood Crime in Providence in 2011

The purpose of this exploratory research project is to determine the extent to which crime patterns are influenced by the location of schools. There has been a small body of research that suggests that schools, particularly high schools, can generate crime at the neighborhood level. In this project, violent crime data from the Providence Department of Public Safety was used to assess the influence of public school location on neighborhood crime incidents and rates in Providence. By including elementary, middle, and high schools, I address the possibility that different levels of schooling are related to neighborhood crime in different ways. I also consider the relationship between schools and crime by time of day, as well as whether certain characteristics of schools (e.g., school size) influence the relationship between school location and crime. The current project examines the following questions: are public schools in Providence related to crime? Does this relationship vary based on crime type, school type, and time of day?

Chenelle Norman – Utilizing Spatial Data to Explore which Pediatric Offices in Rhode Island to Target when Introducing a Child Passenger Safety Pilot Program

In the United States during 2009, 1,314 children 14 years of age and younger died as occupants in motor vehicle crashes, and nearly 179,000 were injured. Many of these deaths and injuries could have been prevented with proper car safety seat installation. In fact studies have shown that car safety seats can reduce injuries and deaths by up to 70% among infants and 54% among toddlers. However, the current misuse rate of car safety seats has been determined to be as high as 70%. Thus, to improve child passenger safety The National Child Passenger Safety Certification Training Program, instituted by Safe Kids Worldwide, has worked with various states to train Child Passenger Safety (CPS) technicians. CPS technicians are trained personnel who educate their community on proper car seat use and installation. In Rhode Island, there are currently 154 CPS trained technicians. Many of these individuals are police officers, hospital personnel and individuals employed by various establishments such as day care centers and the Rhode Island Department of Transportation. Unfortunately, there are still a significant number of motor vehicle accidents that result in severe injuries and/or mortality that could be prevented with proper car seat installation.

Through this study we look to understand (1) the barriers that prevent individuals from obtaining education on proper car seat use and installation from current CPS technicians and (2) to determine whether or not introducing CPS technicians in pediatric offices will decrease this barrier to education. More often than not, race, household income level, and education level are determinants of education attainment. Therefore, with the use of the 2010 Census Data and GIS, I intend to explore these determinants to understand which RI communities would best benefit from a pilot study introducing CPS trained technicians in pediatric offices. If the pilot study proves to be successful it is our hope to encourage all practicing pediatricians to introduce CPS technicians within their offices.

Apollonya Porcelli – Demographic Composition in the Presence of Hydroelectric Dams in Altamira, Brazil

This project will illustrate the race and age compositions in Altamira, one of the largest and most rapidly developing municipalities in the Brazilian Amazon. Home to the controversial Belo Monte Dam, the city of Altamira has seen a massive influx of migrants from within and beyond Brazil. Castelo dos Sonhos, in the southern part of the municipality, includes two small hydroelectric dams. In both locations, the dams will facilitate impending excavation of gold in nearby mines. As seen throughout Amazonia, such developing cities see a change in race, gender and age composition in association with environmental change. By investigating the differences in Altamira and Castelo dos Sonhos, this project will show the relationship between the scale of environmental change and the type of demographic structure.

Marissa Reitsma – Structural Risk Factors and HIV Prevalence in Rhode Island

Human immunodeficiency virus (HIV) incidence in Rhode Island (RI) has decreased dramatically since it peaked at 317 new cases in 1993. In 2011 there were only 51 new cases in RI. Incidence was mainly reduced by effective behavioral interventions, widespread use of antiretroviral therapy, and increased testing. Unfortunately, incidence has plateaued since 2007 at about 50 new cases per year. Behavioral interventions often do not address structural risk factors, and this is one potential reason for why HIV incidence has plateaued in RI. In order to reach the goal of no new infections, innovative approaches to reduce incidence in RI are needed. Geography based interventions are best suited to target structural risk factors. Therefore, GIS can potentially help to reduce incidence in RI to zero.

This research project seeks to explore the geographic distribution of HIV infections in RI in order to provide insight into how structural risk factors, which are often clustered geographically, contribute to HIV risk. I will represent the estimated prevalence of HIV in different census tracts in Rhode Island based upon data acquired from the more than 1,200 patients attending The Miriam Hospital Immunology Center. Using this base map I will explore associations between HIV prevalence and different socioeconomic factors, including education, income and race/ethnicity. Additionally, I will investigate accessibility issues, specifically whether HIV testing centers in Rhode Island are optimally located. The results of this project will serve to 1) spatially represent prevalence of HIV in Rhode Island and identify areas of high prevalence, 2) determine which structural risk factors (low education, low income, minority status, etc) are potentially associated with high HIV prevalence, and 3) identify geographic areas in which interventions addressing structural risk factors would be most effective.

Rachel Scagos – Using GIS to Examine Characteristics of Those Currently Being Served by the RI Department of Health's Living Well Rhode Island Program and to Explore where to Implement More Program Locations

Living Well Rhode Island (LWRI) is a six-week self-management program for people living with a range of chronic conditions that is run by the RI Department of Health. The purpose of my project is to use GIS to map the locations that are currently holding the LWRI workshops and use census data to determine if coverage gaps exist. This data will be used to better target more self-management programs to address these gaps and reduce disparities.

Dantrell Simmons – HIV Testing and Prevention Social Marketing: Identifying High-Risk Areas and Community Stakeholders

Compared to other racial groups, African Americans are disproportionately affected by HIV/AIDS. In 2009, African Americans accounted for 44% of all new HIV infections, while representing 14% of the U.S. population. The south has the greatest number of people living with AIDS in the nation, with African Americans accounting for the majority of new AIDS diagnoses. In Mississippi, African Americans account for 72.5% of the population living with HIV, and in 2011, African Americans represented 76% of the new HIV cases. The Jackson, MS metropolitan statistical area (MSA) has 33% of the state's new HIV cases and according to the Centers for Disease Control and Prevention (CDC), Jackson, MS ranks third in the nation among individuals living with AIDS. Jackson, MS currently has an AIDS rate of 29.2 per 100,000. Despite the alarming statistics, limited community involvement and HIV prevent messages are available. However, by engaging community leaders and geographically targeting HIV prevention messages throughout the city, HIV testing and prevention practices will improve. By targeting high-risk areas, we will be able to further examine a range of sexual behaviors that may be influenced by social and structural factors within each geographic region. Specific aims are: Aim 1: To identify potentially high-risk areas to promote HIV testing and prevention messages in the Jackson, MS, MSA. Aim 2: To identify faith based organizations and leaders located within the identified high risk areas in the Jackson, MS, MSA. To achieve Aims 1 and 2, Mississippi State Department of Health, Census, and Faith-based organization data will be ascertained. Findings can potentially lead to linking individuals living with HIV/AIDS who are unaware to care and reducing HIV incidence throughout the state.

Julia Troche – Middle Kingdom Abydos: Use of Space and the Memory of Place

The ancient site of Abydos is located in southern Egypt. Abydos is the location of the burials and funerary enclosures of the earliest kings of Egypt (Early Dynastic Period, *c.* 3100-2700 BCE). Eventually, during the Middle Kingdom (*c.* 2000-1650 BCE), the site also became associated with the burial of the god Osiris – one of the earliest mythical kings of Egypt. Thus, the site took on a new, cultic dimension - identifiable in the archaeological record by the growth of cult installations, dedicatory stelae and festivals. Alongside this cultic use of space, Abydos continued to be used as a cemetery throughout Egyptian history and into the modern era. Thus, the memory of the site as a place of burial is remarkably persistent. The region of Abydos under investigation by the Brown University Abydos Project (BUAP) is referred to as the Northern Cemetery. While this is a mostly arbitrary delineation (based on institutional rights to a shared concession), it is the necessary research unit for initial study. My project seeks to investigate Middle Kingdom activity within the Northern Cemetery region of Abydos. I hope to better understand how Middle Kingdom actors used the Northern Cemetery space by plotting Middle Kingdom architecture and deposits (mostly burials). I will then plot associated Middle Kingdom portable artifacts (*e.g.* vessels, offering pegs). I hope to then implement spatial analysis to better understand the densities of Middle Kingdom artifacts and deposits, their relative associations, etc. in order to comment on Middle Kingdom use of Abydene *space* and its role in the construction and memorialization of Abydene *place*. Eventually, this analysis will be contextualized, in consultation with research projects of other historic periods, in order to historically situate the Middle Kingdom material.

Michelle Un – Neighborhood Effects on College Participation Outcomes in Providence, RI

This project aims to analyze college participation in Providence, RI, specifically that of students from the 2012 and 2013 (projected) graduating classes of Mount Pleasant High School, a large public school of about 1,000 students. Because students living in the city of Providence can elect to attend any high school in the city (with the exception of the magnet school Classical High School), students live in neighborhoods all across Providence. The student population, unlike Providence as a whole, is relatively homogenous. Almost all of the students who attend Mount Pleasant High School are low-income, first-generation (college), minority students, many of which are ESL students. However, their college participation outcomes are vastly different. This project will explore what role neighborhoods play, if any, in building educational aspiration and achievement. Using GIS, this project will examine the neighborhood effects on college participation by analyzing how factors, such as median household income, educational attainment, race, and proximity to college/universities play a role in students' college participation in 2-year or 4-year post-secondary institutions.

Yashas Vaidya – Role of Space in Social Determination of Health: Spatial Patterns in Incidence of Child Anemia in Nepal

For my master's thesis, I am examining the social determinants of child health in Nepal. Before doing detailed regression analysis, I want to explore the spatial distribution of child anemia, the specific health condition of interest. Spatial patterns in its incidence and severity would help me understand whether and what social and geographic aspects should be emphasized during regression analysis. Data sources will include the nationally representative Demographic Health Surveys from two different phases (2006 and 2011) and the national census from 2011.

Meghan Wilson – The Renaissance of Education: Shifts in Public Opinion Due to Emergence of Educational Choice in Detroit

In 1999, the State of Michigan intervened in the failing Detroit school district by usurping financial control of the district and reallocating power while restructuring educational choices. Detroit is not the only place that has seen major interventions in recent years. Over the years through takeovers, national initiatives, and disaster capitalism, education has shifted to a choice of various portfolios. This project attempts to answer several questions that arise with the growth of educational choice: How has the introduction and growth of charter schools influenced mass perceptions and support for public education in Michigan? Are charter schools considered independent from traditional public schools? How does proximity to a charter school affect the residence rating of the local schools? The structure of charter schools has caused an emergence of new, more centralized (and even in some cases authoritarian) leaders. In the case of Detroit schools, the paradigm shift has not only come in the shape of new and creative curricula, but also educational leadership. Charter schools create competitive markets for local education. While these competitive markets have dramatically cut cost to the state, they change the dynamics of education by cutting out the parental and neighborhood involvement. This project examines public opinion of public schools based on their proximity to a new charter schools.

Di Wu – Family Tree of Wu and the Chinese Urbanization

My research is about my family tree of Wu (my family name) and the history of China that it presents. The family tree is renewed every 50 year, but it is interrupted by the Cultural Revolution and other events. Fortunately, it was renewed several years ago with the help of government. In ancient time, it was easy to renew the family tree because of the old structure of Chinese village structure that people of same family name were centralized. Now it is not an easy job. Coinciding with industrialization and urbanization, the old social structure is broken and people have more freedom of mobility. However, the identity is still a significant thing especially the most tombs of forefather are destroyed by Cultural Revolution and Urbanization. So the family tree is a method to build self-identity.

The aims of my research are 1) study the movements and migrations of recent generations caused by wars, Cultural Revolution and Urbanization. 2) analyze the influence of Cultural Revolution and Urbanization in change of ancestor worship.

The dates I analyze are one of branches of my family tree that records 110 generations and their details especially the information of their residences. The dates will give me a graphic description of the mobility and the GIS will vividly show the change and the trend of urbanization. Moreover, GIS will assist to renew the family tree when the old social structure is broken.

Shuo Yang – Inferences about the Paleoclimate Reconstruction from Isotope Signature of Eastern Equatorial Pacific Surface Waters based on Alkenone-Specific Hydrogen Isotopes

Alkenones are long chain unsaturated ketones produced by haptophyte algae living in marine surface waters. Alkenones are widely used to reconstruct sea surface temperatures. However, the utility of alkenone-specific δD for interpretation of source water δD values is not well characterized due to the present limitations in chromatographic separation, suggesting a more accurate interpretation of the δD values in the source water. Using new chromatography technology to separate alkenones, we can make inferences about the modern sea surface water δD by alkenone-specific δD from Eastern Equatorial Pacific Cruise Project Sites. This new method has the potential to more accurately track water δD values and provide a proxy for paleosalinity reconstruction. GIS Winter Institute will give us base maps of variables such as temperature, salinity and bio-productivity that will allow us to analyze their spatial relationships in Eastern Equatorial Pacific surface waters.

Annajane Yolken – Do One Thing: Mapping a Geographically-Based HIV and Hepatitis C Outreach, Testing, and Treatment Campaign

Philadelphia's HIV infection rate is five times the national average. African Americans represent 70% of new infections. Limited HIV testing and care services in Philadelphia neighborhoods with both high concentrations of African Americans and the highest infection rates may contribute to racial disparities in HIV infection, including in Southwest Philadelphia. We developed a neighborhood-based HIV and Hepatitis C (HCV) testing, awareness and media program entitled Do One Thing to stimulate demand for and provide HIV and HCV testing across zipcode 19143 in Southwest Philadelphia. Do One Thing's primary components include: 1) routinely offering HIV testing at the Health Annex 2) a door- to-door HIV and HCV testing and linkage to care campaign in four census tracts in zipcode 19143; 3) a large-scale social

marketing campaign 4) massive mobilization of community leaders; 5) training health professional students and local residents in community outreach.

For my GIS project, I mapped the sites of community partners, organizations, and churches of the Do One Thing campaign. I also mapped the locations of our mobile medical unit and the street blocks where we have performed outreach about HIV and HCV. I have utilized spatial analysis to examine factors including socioeconomic status, race, and HIV prevalence to determine if we have reached high-risk regions of the 19143 zipcode. I also mapped “hot spots”—places which neighborhood residents have told us are places where sex work, injection drug use, and MSM (men who have sex with men) activities occur. I used buffering techniques to determine if we have sufficiently reached those “hot spots” with our mobile medical unit.