

Spatial Structures in the Social Sciences

2011 Winter GIS Institute

Final Presentation Program

January 21, 2011 Population Studies and Training Center, Seminar Room

9:00 – 9:15 am	Welcome
9:15 – 11:00 am	Session I: Exploring our Local Surroundings: Providence, Rhode Island, and New England
11:00 am – 12:15 pm	Session II: International Development: Understanding Growth and Development I
12:15 – 1:15 pm	Lunch
1:15 – 2:45 pm	Session III: International Development: Understanding Growth and Development II
3:00 – 5:00 pm	Session IV: Spatial Analysis Applications: The United States
5:00 – 5:15 pm	Certificate Presentation
5:15 pm	Close of Conference

PARTICIPANTS

Jessica Avizinis (Office of Environmental Health & Safety)

Mongoljin Batsaikhan (Economics)

Maria Angelica Bautista (Political Science)

Marcelo Bohrt Seeghers (Sociology)

Aisalkyn Botoeva (Sociology)

Paul Christian (Economics)

Marcy Cockrell (Ecology & Environmental Biology)

Allison Davis (Joukowsky Institute)

Emilio Depetris-Chauvin (Economics)

Zhanlian Feng (Community Health)

Sara Fingal (History)

Diana Graizbord (Sociology)

Leah Greenblum (Sociology)

Myra Brielle Harbin (Political Science)

Hayley Khan (Education)

Adam Kotin (Center for Environmental Studies)

Tad Kugler (Political Science, Roger Williams University)

John Marston (Joukowsky Institute)

Taryn Martinez (Center for Environmental Studies)

Jamie McPike (Sociology)

Elli Mylonas (Library)

Gareth Olds (Economics)

Irene Pang (Sociology)

Shivaani Prakash (Community Health)

Ian Straugn (Joukowsky Institute/Library)

Mei-Fen Yang (Community Health)

PROGRAM

SESSION I: EXPLORING OUR LOCAL SURROUNDINGS: PROVIDENCE, RHODE ISLAND, AND NEW ENGLAND

Mei-Fen Yang, *Determining Relationships between Geographical Factors and People's Eating Routine in Providence, Rhode Island*

Marcy Cockrell, *Exploring the Potential for Salt Marsh Upland Migration and Conservation in Buzzard's Bay, Massachusetts*

Leah Greenblum, *An Exploratory Spatial Analysis of Foreclosures in Rhode Island*

Myra Brielle Harbin, *Playing Lotto: A Preliminary Analysis of Boston and Providence Charter Schools, Their Students and the Broader Communities in Which They Are Established*

Hayley Khan, *Under-18 Population Density and the Distribution of Elementary School in Providence Neighborhoods: Mapping for Community Schools*

Jessica Avizinis, *GIS Mapping for Research Facility Ventilation Systems*

Taryn Martinez, *Rhode Island Children's Access to Environmental Education NGOs*

SESSION II: INTERNATIONAL DEVELOPMENT: UNDERSTANDING GROWTH AND DEVELOPMENT I

Mongoljin Batsaikhan, *Spatial Competition among Wholesalers: Evidence from the Phone Card Industry in Mongolia*

Aisalkyn Botoeva, *Exploring Growth Patterns of Small & Medium Enterprises in Post-Soviet Kyrgyzstan*

Marcelo Bohrt Seegers, *Proximity to Capital Cities, Economic Growth and Municipal Ethnic Composition: Bolivia between 1992 and 2005*

Maria Angelica Bautista, *Health and Social Protection in Weak States: Comparative Research on the Middle East*

Diana Graizbord, *A Human Capabilities Approach to Understanding Development in Post-Apartheid Johannesburg*

**SESSION III: INTERNATIONAL DEVELOPMENT:
UNDERSTANDING GROWTH AND DEVELOPMENT II**

Paul Christian, *Spatial Patterns of Malnutrition in India*

Allison Davis, *Formative Period Settlement Patterns in Cusco, Peru (2200 BC – AD 200)*

Tad Kugler, *Party Dynamics: Exploring how Indian Provincial Elections Help to Illustrate Disunity and Conflict*

John Marston, *Microenvironmental Effects on Plant Community Formation in the Steppe Grassland of Central Turkey*

Irene Pang, *Exploring Patterns of Internal Migration in China*

Ian Straugn, *Who Broke the Pots of Petra? Spatial Analysis of Ceramic Survey Data from one of the Wonders of the World*

SESSION IV: SPATIAL ANALYSIS APPLICATIONS: THE UNITED STATES

Emilio Depetris-Chauvin, *Fear of Obama: A Call to Arms? An Empirical Study of the Demand for Guns during the Months Surrounding the 2008 Presidential Election*

Adam Kotin, *Crop Insurance Enrollment and Climate Change: Examining the Impacts of Extreme Weather Events on Crop Insurance Sign-Ups*

Zhanlian Feng, *Elderly Migration Flows and Nursing Home Residence Rates: A County-Level Analysis*

Shivaani Prakash, *Using GIS to Analyze Leading Causes of Mortality in Rural Health Professional Shortage Areas and the Spatial Significance of Rural Health Care Providers*

Jamie McPike, *Health Disparities in California: A Spatial Exploration of Social Inequality, Health Access, and Health Outcomes in Alameda and San Francisco Counties*

Sara Fingal, *Coastal Motivations?: Mapping Voter Response to the California Coastal Zone Conservation Act of 1972*

Gareth Olds, *Local Learning and the Perceived Returns to Education: Evidence from California*

Elli Mylonas, *Mapping the Catskills Colonies*

PRESENTATION ABSTRACTS

Jessica Avizinis - GIS Mapping for Research Facility Ventilation Systems

Brown University campus covers 140 acres, employs a total of 4,629 people, and educates 8,417 students. There are nine research facilities and 1,688 laboratory researchers. The buildings on campus require many hours of maintenance every year and with that maintenance there is often data collected. Additionally, federal guidelines require annual inspections of certain infrastructure as well as employee safety training. This is another area where Brown University collects vast amounts of data which, as of now, are housed in spreadsheets on various shared drives. GIS mapping will enable Brown University's Facilities Management Engineers and Environmental Health and Safety Staff to manage and evaluate this data in a more sophisticated, integrated and interactive way. One item specifically that can benefit from GIS is laboratory ventilation. Here, we have infrastructure that sometimes changes and annual data on performance of individual laboratories and chemical fume hoods. Environmental Health and Safety must work together with Facilities Management to ensure that laboratory ventilation is always working appropriately in the nine research buildings. I have mapped the location of all of the fume hoods in each of the research buildings. Each fume hood point is connected to the annual testing data for the last three years.

Mongoljin Batsaikhan - Spatial Competition among Wholesalers: Evidence from the Phone Card Industry in Mongolia

My research focuses on how low income people in Mongolia start up and extend their businesses. Typical businesses started by people with low income are small shops, which is my research target. First, I have collected my own unique data and added more data through a legal contract with a telecommunication company to keep the high quality of the data. I concentrate my study on prepaid cell phone recharging cards. These cards are identical and the price is fixed by mobile carriers. Therefore, this particular product gives the wholesalers only a few choice variables, which enables me to look at the spatial structure and pattern of the market more clearly than any other cases. Specifically, I ask how wholesalers decide on retailing locations over the market space and expand their business over time. I will particularly look at how the wholesaling spatial structure changes over time and how marketing efforts and financial support from wholesalers contribute to this.

Maria Angelica Bautista - Health and Social Protection in Weak States: Comparative Research on the Middle East

In much of the Global South, welfare states are either underdeveloped or virtually nonexistent while non-state actors play vital roles in providing basic health services and, more broadly, in ensuring social protection. This project focuses on two questions: How do ordinary people gain access to health care and maintain or improve their well-being in contexts where public health systems are deficient?; and, which kinds of state and non-state actors are more effective at providing health services and ensuring social protection? The project focuses on Palestine. This regional focus raises a related question, notably what explains the apparent "Islamist advantage" in the provision of health care and other basic services. The collaborators aim to refine the framing of the research, collect preliminary data and generate baseline analyses needed for more in-depth, systematic research.

Marcelo Bohrt Seegers - Proximity to Capital Cities, Economic Growth and Municipal Ethnic Composition: Bolivia between 1992 and 2005

In this study, I focus on the relationship between proximity to capital cities and economic growth at the subnational level in developing countries. Using Bolivia as a case study, I look at 308 municipalities over a 14-year span with three data points (1992, 2001 and 2005). The Bolivian experience with municipal-led development has seen at best mixed results. It is clear from the Human Development Reports published by the United Nations Development Programme that the majority of municipalities experienced economic growth, as measured by the average income per capita. However, on the magnitude of such growth, their experiences have been varied; some grew significantly and others only slightly. After controlling for initial endowments, how does distance to capital cities relate to economic growth? Moreover, does the spatial distribution of economic growth relate to the ethnic composition of municipalities?

Aisalkyn Botoeva - Exploring growth patterns of Small & Medium Enterprises in post Soviet Kyrgyzstan

My research is on the formation of a market economy in the post Soviet milieu, with a particular focus on Small & Medium Enterprises (SME). SME have arguably come to serve a lead role in building markets, by restructuring economic institutions, explicating the need for secure private property, serving as new sources of income for individuals and significantly contributing to government budgets. I am fascinated to explore how given the catalog of deficits in this context, private enterprises were formed and how they manage to stay afloat.

For this exploratory GIS project, I aim to look at the patterns of growth of SME by administrative districts in Kyrgyzstan, as well as employment of the population in SME by region.

Paul Christian - Spatial Patterns of Malnutrition in India

My research involves inequalities in nutritional status (BMI, height-for-age, etc) within households in India and the Philippines. I am interested in the way that household structures influence investment in different members. For example, I've found in India that children who live with elderly household members are more likely to be malnourished than their peers who do not. To investigate this process, I am modeling and simulating the process of household splits. But I'd also like to identify (potentially spatial) variation in the costs and benefits of investing in nutrition of different members and see if household splits respond to this variation. Sources of this variation might include suitability for different crops by area which affects energy expenditure needs of people involved in agriculture, or relative prices of different food items. For the GIS institute, I'd like to conduct some exploratory analysis of variables that influence nutritional investment like dominant crop in an area, average price of cereal crops, etc. I'll start with maps by state in India and include districts if time allows. My main datasource will be the ARISREDS survey of households in rural India.

Marcy Cockrell - Exploring the Potential for Salt marsh Upland Migration and Conservation in Buzzard's Bay, MA

Ecosystem services are the direct and indirect benefits provided to humans by virtue of proper ecosystem function. Salt marshes are known to supply important ecosystem services such as nurseries for juvenile fish, nutrient cycling, pollution filtration, storm protection, erosion prevention, and space for recreation. At the same time, salt marshes are facing serious threats from human development and increasing rates of sea-level rise (SLR). An estimated 80% of salt marshes in New England have already experienced degradation and loss due to human development and SLR. In southern New England, human development and SLR have dramatically altered the species composition, ecological integrity, and proper functioning of salt marshes. One such consequence that has been recently described is the migration of salt marsh plant species from the seaward to the terrestrial edge of the marsh - a process known as 'upland migration.' Upland migration may allow salt marshes to persist in the face of increasing SLR, but depends largely on the characteristics of the terrestrial border, including elevation and slope and current land use. The rate of marsh development *via* sediment deposition must also match or exceed the rate of SLR in order for a salt marsh to persist.

The salt marshes in Buzzard's Bay, MA have been degraded over the past several decades, but may show potential for conservation and/or restoration if upland migration and sediment deposition can keep pace with or outpace increasing sea-level rise. This study aims to identify areas in Buzzard's Bay that show potential for upland migration and/or conservation in the face of increasing SLR and human development. This study is largely an exploratory analysis that may inform future research and conservation objectives.

Allison Davis - Formative period settlement patterns in Cusco, Peru (2200 BC – AD 200)

I study pre-Inka early villages in the Cusco region of Peru. I am broadly interested in the origins of social inequality, the development of the first multi-village polities, and the role that the diverse mountain environment (ca 3,000-4,000 masl) played in these processes during the Formative period (2200 BC – AD 200). My project combines settlement pattern data collected during systematic pedestrian survey carried out by seven different archaeological projects between the early 1980s and 2005. The surveys identified 292 Formative period archaeological sites based on surface scatters broken pottery and stone tools. I am interested in investigating several questions using GIS and this survey data. (1) What ecological zones were most heavily exploited? (2) Were there clusters of settlements that might represent multi-village polities? And, (3) were large and important sites located along trade routes that correspond to natural paths in the topography? This study would help archaeologists understand the roles that resource utilization and trade may have played in the development of the first multi-village polities in Cusco.

Emilio Depetris-Chauvin - Fear of Obama: A Call to Arms? An Empirical study of the demand for guns during the months surrounding the 2008 presidential election

In this project I study the demand for guns during the months surrounding the US 2008 presidential election. Specifically, I analyze how it responds to information regarding the likelihood of a given candidate being elected. I present empirical evidence that not only the party affiliation but also the identity of the candidate would matter in terms of what the individuals expect regarding future administration's policies. Furthermore, I present empirical evidence consistent with the hypothesis that the unusual increase in the demand for guns would be partially driven by fears of an Obama's future gun-control policy. But even more striking, intolerance against blacks would have also played a differentiating role. That's, the demand for guns has not only significantly changed during the election race (i.e: it presents significant variation across time) but it also presented a differential pattern across states: it was higher in states with higher values of an index of prejudice against blacks (based on responses from whites aged 18 and older to different question related to racial feelings), and looser gun laws/high gun liberty index (i.e: lower values in the distribution of the Brady's State Scorecard). During the second week of the GIS Institute I will be working in 2 aspects: the creation of maps and spatial autocorrelation testing. First, I will create 3 different maps showing the geographical distribution of the increase in the demand for guns during the second half of 2008 (year on year growth rate), and the distribution of two indexes: prejudice against black and a gun liberty index. The inspection of these 3 maps would be a first approach to detect spatial auto-correlation/clustering of data. Secondly, using Moran's I statistics I will study the existence of spatial correlation for each of my three variables of interest (i.e: demand for guns, prejudice and gun liberty index). Here, I will check the robustness of results to the election of proximity. Finally, I will study how spatial correlation among states in key variables (if any) would affect my regression analysis (which is based on panel data).

Zhanlian Feng - Elderly Migration Flows and Nursing Home Residence Rates: A County-Level Analysis

Despite an intensive literature on residential mobility in old age, few studies have examined the relationship between elderly migration and nursing home use patterns in the U.S. Using county-level data from the 2000 Census, this study unravels the associations between nursing home use rates (number of nursing home residents 65+ per 1,000 population 65+) and internal migration rates among the 65+ population. Two types of elderly migration are distinguished: residential moves within the same county (percentage of intra-county movers) and moves that crossed county boundaries (net migration rate), both measured over a five-year period, 1995-2000. Within each type, separate rates are calculated for the young-old (ages 65-74), old-old (75-84) and oldest-old (85+). An exploratory spatial data analysis suggests a clear pattern of spatial clustering and evidence of spatial autocorrelation in nursing home residence rates across counties. A multivariate spatial error model accounting for spatial autocorrelation is used to predict nursing home residence rates as a function of both intra- and inter-county elderly migration flows, controlling for nursing home bed supply, measures of socio-demographic vulnerability, state long-term care policies and regional fixed effects. Results indicate that

counties with higher net migration rates among the old-old or oldest old have significantly higher nursing home residence rates. Similarly, higher intra-county mobility rates among the old-old or oldest old are associated with higher nursing home residence rates. However, migration streams among the young-old, whether intra- or inter-county, are not significantly associated with nursing home residence patterns. These findings are consistent with hypotheses concerning the health trajectories of older adults in a life course perspective.

Sara Fingal - Coastal Motivations?: Mapping Voter Response to the California Coastal Zone Conservation Act of 1972

This project seeks a better understanding of the citizen motivations for voting for or against the California Coastal Zone Conservation Act, also known as Proposition 20, in 1972. Proposition 20 was placed on the 1972 ballot by an activist organization called the Coastal Alliance. The Alliance's goal was to create a state bureaucratic body to ensure public access sites, ecological protection, and regulate future development along the California coastline. This government regulatory organization was later called the California Coastal Commission. Historians have suggested that the majority of California voters were possibly motivated to approve the proposition by the memories of the Santa Barbara oil spill in 1969 and anti-development elitism. Few historians have examined the rise in coastal populations, the increase in real estate prices, or voter proximity to the coastline, as other potential complexities that contributed to voter approval of the Act. Using GIS mapping tools and data from county voter returns, the 1972 election, and the 1970 census, I will examine the maps to determine if coastal residents were more likely to vote in favor of the proposition, regardless of their political orientation. These findings will contribute to my larger question of what motivated California voters to weigh in on the debate over who owned and controlled the coastline.

Diana Graizbord - A Human Capabilities Approach to Understanding Development in Post-Apartheid Johannesburg

During apartheid the segregation and spatial engineering resulted in the concentration of public services and infrastructure in white sections of South African cities, while the all-African townships, and mixed-race sections were historically neglected. Because post-apartheid South Africa represents one of the most ambitious attempts at planned transformation ever undertaken in a democratic society, the spatial dimensions of local development can be easily observed. Using *subplace* level data from the South African Census (1996, 2001) as well as infrastructural data collected from government agencies, this preliminary research makes a first effort to operationalize Amartya Sen's capabilities approach to development. While Sen has been ambivalent about operationalizing this approach, others (ex. Nussbaum 1999; 2001) have argued for universal and measurable indicators. Using Nussbaum's 'Central Human Functional Capabilities' as a conceptual guide, a community level Capabilities Index was constructed and mapped for 1996 and 2001. Particular attention is paid to the changes observed over time, in the formerly all-African townships, and predominantly mixed-race neighborhoods.

Leah Greenblum - An Exploratory Spatial Analysis of Foreclosures in Rhode Island

The recent economic recession and, in particular, the 2007-08 foreclosure crisis has impacted our neighborhoods. This exploratory project will ask, what is the spatial distribution of foreclosures in Rhode Island from 2007 to 2008? What is the association between foreclosures and race? I will use data collected by HUD and the American Community Survey to answer these questions, offering descriptions of the clustering of foreclosures in particular RI neighborhoods.

Myra Brielle Harbin - Playing Lotto: A Preliminary Analysis of Boston and Providence Charter Schools, Their Students and the Broader Communities in Which They Are Established

Does a spatial relationship exist between the social and economic make up of charter school student populations and the communities in which they are established? As research on educational reforms make clear, charter schools are often established to expand scholastic opportunities for students from diverse racial and socioeconomic backgrounds. Indeed, in states where charter schools exist, student admissions are decided by a lottery system when the total number of applications exceeds the number of spaces available for new students in a given academic cycle.

The current conference presentation is an exploratory look at the social and socio-economic composition of Boston and Providence city charter schools. Using data collected from Massachusetts and Rhode Island state education boards, as well as the United States census bureau, the current research endeavor investigates what spatial relationship, if any, exists in where charter schools are opened and the racial and socio-economic student bodies in which they ultimately come to serve.

Hayley Khan - Under-18 Population Density and the Distribution of Elementary School in Providence Neighborhoods: Mapping for Community Schools

Shifting neighborhood demographics complicate the process of developing infrastructure necessary for healthy schools and communities. In Providence the percentage of population made up by children under 18 has fluctuated over the years and varies widely by neighborhood; from the low (7% in Blackstone and 8% in Fox Point) to far higher rates in Valley (34%) and Lower South Providence (39%). With a population of 4,867, this means Fox Point has 389 residents under 18, while Valley, (4,765) houses 1,620 children. Another useful pair to contrast might be Elmhurst (11,491, 15 %) which has 1,723 children and Elmwood (11,533, 35%) with 4,037. These variations have significant implications for policy regarding school construction, closure, and student assignment.

According to the Providence Plan, the total number of children enrolled in their neighborhood school has increased while the percent of such students has declined; this means that although the rate of students enrolled in their neighborhood school is climbing, the population of children is growing faster. Concurrently, a trend toward neighborhood or “Full Service Community Schools” schooling is emerging, evident locally in five “FSCS” schools in South Providence.

For such a program to create a true neighborhood model, schools must be distributed geographically so children can attend in their own neighborhoods. Though it can be challenging for district policy to keep pace with rapidly changing demographics, schools (both public and charter) do expand and open while “failing” schools are shuttered. Using ArcGIS, I examine the percentage of children under 18 in Providence neighborhoods and examine how this relates to 1) number of existing public schools in that community 2) number of new or expanded schools opened in the last 10 years and 3) number of school closures or “failing schools.”

Adam Kotin - Crop Insurance Enrollment and Climate Change: Examining the Impacts of Extreme Weather Events on Crop Insurance Sign-ups

The Federal Crop Insurance Corporation has offered subsidized crop insurance to U.S. farmers since it was created by an act of Congress in 1938. In the aftermath of the Great Depression and numerous weather-related disasters of the 1930s, the program was set up to protect farmers from fluctuating markets and unpredictable growing conditions. It has gone through a number of iterations since then, seeing a dramatic spike in enrollment in the 1990s after pricing options were expanded and extended to more crops. According to the Environmental Working Group’s Farm Subsidy Database (<http://farm.ewg.org/>), government support of these programs has totaled over \$62 billion since 1995. A recent (2007) report by the Government Accountability Office suggests that increased indemnity claims under extreme weather from climate change may stretch the ability of the government to continue subsidizing the program. Climate adaptation literature suggests that farmers make farm-level changes much more readily after being hit by an extreme weather event. Additionally, the literature suggests that purchasing crop insurance is a primary strategy for farmers to employ in adapting to climate change.

I examine changes in crop insurance enrollment, by continental U.S. county, between the 2002 and 2007 census years. I analyze these enrollment changes for clustering and other spatial correlations. Using data from NOAA’s Storm Prediction Center and Drought Monitor, I map extreme weather events commonly covered by crop insurance (i.e. drought, hail, tornadoes). I examine the spatial distribution of crop insurance enrollment shifts to see if they correlate with extreme weather events based on the size, frequency, and location of extreme weather events in the inter-census years (using records from the preceding 10 years as a baseline).

Tad Kugler - Party Dynamics: Exploring how Indian Provincial Elections Help to Illustrate Disunity and Conflict

India has moved from the forgotten giant to possibly the next great source of the world's economic growth. At the same time India allows for some of the closest possible natural experiments for the study of politics. The nation has high levels of income disparity, large amounts of languages, religions, ethnic groups, and the remnants of past national identities. This means that in effect to study India is to study what the world would be like with a unified government and free flowing borders. This paper builds upon the work of Saez 2009 and Hasan 2002 with a focused look at how the rise of provincial parties, ethnic parties, and new levels of political competition affected the political economy realities of the provinces. Growth has not been a constant across provinces and it is this new level of disparity that will help to create a new India but also create the next generation of problems be it economic, military, or political. The paper will utilize spatial modeling techniques to explain regional characteristics in India from 1980-2000.

John Marston - Microenvironmental Effects on Plant Community Formation in the Steppe Grassland of Central Turkey

Community ecology theory holds that individual species may respond to environmental variables in similar ways, thus creating groups of species (communities) that occupy an area together. This project aims to determine the spatial effect of microenvironmental variables on plant community formation in one experimental area in central Turkey by applying exploratory spatial data analysis (ESDA) to 12 years of botanical survey transect data. The spatial patterning of slope, aspect, and soil type, together with inter-annual rainfall variation, are examined as predictors of plant community type. This analysis aims to 1) identify how many spatially- or temporally-defined plant communities exist in the area, 2) which individual species serve as markers for each community, and, 3) through ESDA, which environmental variables best predict plant community type across the experimental area.

Taryn Martinez - Rhode Island Children's Access to Environmental Education NGOs

Environmental education is viewed as an increasingly important part of children's growth and development; hands-on environmental education experiences, like those provided by non-governmental organizations (NGOs), have been shown to mitigate attention deficit disorders, obesity, and depression in children. However, environmental education may not be equally available to all children, especially those whose families live far away from NGOs, cannot afford extracurricular activities, or lack education themselves. Studies have established that a child's proximity to green space is linked to physical and mental health.

In this project, the spatial location of environmental education NGOs (and their associated centers, sanctuaries, and properties) will be mapped against pertinent demographic information—specifically, low-income, low-education level families of color with young children. The locations of bus stops and bus lines will serve as a proxy for NGOs' accessibility to low-income individuals. Using spatial data analysis, I will determine the number and characteristics of children living within the recommended 300m of NGO-owned greenspace or environmental education centers, and where the ideal environmental education NGO (i.e.,

reaching the greatest population of low-income children of color) would be situated. Predictions will also be made on which populations are most likely to utilize the existing mapped NGOs; these predications will later be tested against collected field data of NGO membership and participation numbers. Because environmental education is so important, it is critical to ensure that all children, especially those who are part of traditionally-underserved populations, have access to environmental goods. Information for this project will be provided by RIGIS and the Environmental Council of Rhode Island.

Jamie McPike - Health Disparities in California: A Spatial Exploration of Social Inequality, Health Access, and Health Outcomes in Alameda and San Francisco Counties

Disparity in the rate of hospitalization for preventable diseases is argued to be a strong indicator of health inequality. Those who are unable to avoid or receive treatment for preventable diseases (e.g. asthma and dehydration) are often vulnerable populations who lack health insurance, are primarily low-income, and have poor health literacy. In the state of California, despite a recent statewide decrease in these rates, some counties remain far behind in their ability to provide care for preventable diseases. This project explores regional health inequalities in California by comparing differences in the rates of hospitalization for preventable diseases with health infrastructure and socio-economic demographic data by county. This exploratory project will use data from two neighboring California counties (Alameda County and San Francisco County) with dramatically different hospitalization rates. Specifically, I plan to map health facilities by type (i.e. primary care, emergency facility, etc.), the location of health advocacy groups (serving as a proxy for health literacy), and health coverage areas within each county to determine the ability of local populations to access health care and health resources within each county. I also plan to map socio-economic demographic indicators like race, rates of poverty, and education level to see how regional differences in these social determinants of health relate to county hospitalization rates. The primary objective of this project is to explore countywide differences and offer a descriptive picture of some reasons for the dramatic health inequalities between these two neighboring California counties.

Elli Mylonas - Mapping the Catskills

There were over 1000 Jewish resorts, hotels, and bungalow colonies in the southern Catskills region of NY State in the 1st half of the 20th century. As part of his Catskills project, Phil Brown (Sociology) has collected the names of about 2000 known colonies, with the name of their name town or locale. This project will outline the groundwork that would be necessary for a larger, ongoing project to map these resorts, and to study how they were clustered, and where they were situated in relation to roads and railroads. The scope of this exploratory project will be to see how many of locations are discoverable on a map, and to see how the resorts were clustered. Railroad tracks are a fairly static feature, so it is also possible to discover how close to railroads the colonies were situated. This would also be interesting to do with roads, but it would not be informative unless it was possible to use a road map from before 1950, when interstates were built.

Gareth Olds - Local Learning and the Perceived Returns to Education: Evidence from California

My aim is to use geocoded census block group-level data from California to examine the spatial aspects of the perceived returns to education. Specifically, I will examine the residuals of a regression of years of education on economic, social and racial factors and describe their pattern of spatial correlation. One hypothesis for lower-than-predicted clustering is contained in the so-called "culture of poverty" literature in economics and sociology. However, based on evidence from the development economics literature, it is also possible that localized learning about the returns to technology (in this case, higher education) is occurring, creating clusters of higher-than-predicted education. To this end, I will: (a) determine the relationship of this clustering to socio-economic categories, and (b) as estimate the effect of proximity to institutions that might enhance local learning by facilitating face-to-face interactions (e.g. town halls and community centers) or by communicating information on the returns to education directly to residents (e.g. colleges and universities).

Irene Pang - Exploring Patterns of Internal Migration in China

Internal Migration in China has expanded dramatically since economic reforms in the late 70s and early 80s, and is likely to continue to grow with China's rapid economic development. While it is well known that several large cities, such as Beijing and Shanghai, as well as newly-developed industrial areas such as the Pearl River Delta area, attracts millions of internal migrant workers, patterns of internal migration in the rest of the country are arguably less well-known. Using Chinese Census Data from 2000, this project begins to explore patterns of internal migration in all of China, paying attention both to patterns of in-migration and out-migration.

Shivaani Prakash - Using GIS to Analyze Leading Causes of Mortality in Rural Health Professional Shortage Areas and the Spatial Significance of Rural Health Care Providers

There are several features of health care systems in rural areas that differentiate them from urban or suburban areas. The prevalence of particular health conditions, the lack of health facilities, the difficulty in attracting health care providers, and problems relating to access in isolated areas all create challenges for policymakers designing health care delivery systems for rural residents. Rural areas often lack core health services, such as primary or emergency care in the community, mental health care and dentistry. These areas are often designated as Medically Underserved Areas (MUAs) or Health Professional Shortage Areas (HPSAs). Additionally, rural populations tend to be older than urban populations and experience higher rates of complications due to chronic conditions. This exploratory analysis will use ArcGIS tools to spatially characterize those health issues and demographic features of rural areas in the Midwest that are significantly different from urban or suburban areas. Using 2000 Census data and health care distribution data from the Centers for Disease Control and Prevention, I plan to map out the distribution of the lead causes of morbidity and mortality in rural MUA or HPSA regions. This study will also identify the locations and buffer zones of Rural Health Clinics and Critical Access Hospitals, which are often the first point-of-contact between rural residents and the health care system, in order to analyze the potential reach of these providers in relation to the highly underserved rural regions that could benefit greatly from core health services. Finally, I hope to use spatial analysis techniques to begin examining the locations of rural clinics and hospitals that could potentially

optimize the delivery of needed health care services to underserved areas. This work will add to the growing body of research relating to geographic variation in both the availability of health care services and the prevalence of certain health conditions.

Ian Straugn - Who Broke the Pots of Petra? Spatial Analysis of Ceramic Survey Data from one of the Wonders of the World

It wasn't the transformers, nor was it Indy. Instead, it seems that the Nabataeans of the Roman period were particularly clumsy with their various ceramic wares. This project will examine what they were doing in the areas to the north of the city center with jars, cookpots and other items of material culture in tow. Did such patterns similarly influence modern scofflaws leaving their plastic bags, shoes and coke cans for the archaeologists to gather and count? Analysis of the survey data collected in 2010 will employ cluster analysis and spatial regression to compare the distribution of the ceramic finds with other aspects of the archaeological landscape including the location of known sites and hydraulic features.

Mei-Fen Yang - Determining Relationships between Geographical Factors and People's Eating Routine in Providence, Rhode Island

This GIS project is based on the research "Your Healthy Life"/ "Su Vida Saludable" (YHL-SVS) led by Dr. Kim Gans from the Department of Community Health at Brown University. The purpose of this project is to investigate the mediator variables that influence people's eating habits, which involve geographic factors. The data being used in the analysis was collected in Providence, Rhode Island through a telephone survey. It mainly asks about people's vegetable, fruit, and fat consumption. The sample was from 870 Providence residents. Using GIS software, we are able to locate each sample, as well as all the food stores and fast food restaurants in Providence, Rhode Island, and subsequently analyze these geographic variables. People living proximity to supermarkets and groceries are assumed to have a better accessibility to vegetable and fruit, so that they consume more of them. Another assumption is that people living close to fast food restaurants consume more fat than people who are far away from these restaurants. The project hopes to examine the above factors and other related spatial determinants of people's diet habits.