



**Paper Presentations
By Faculty and Students**

GEOGRAPHY DIVISION

**DEPARTMENT OF GEOGRAPHY,
ENVIRONMENT, AND PLANNING**



Protecting the Natives in the Everglades: Eradicating Exotic Invaders, Restoring Authenticity?

**is part of the Paper Session:
Conservation and Protected Areas**

scheduled on Sunday, 2/26/2012 at 16:40 PM.

Author(s):

Kevin Archer* - University of South Florida

Abstract:

The infiltration of exotic species is considered to be a major, and growing, problem in natural areas around the world. Such species, it is argued, tend to take over such areas by propagating faster than native species, crowding out habitats, consuming native species or their traditional food supply, rapidly reducing biodiversity, and otherwise disrupting whole ecosystems and the important services they provide.

Moreover, the prevailing belief is that such exotic bioinvasions are increasing in extent and profundity in this age of intensifying globalization. If this is true, and if such invasions indeed are leading to a steep decline in biodiversity, then it may be that globalization is not just leading to more homogeneous cultural norms across the planet, as some argue, but also more homogeneous global nature. Or perhaps, instead, the rhetoric by which such apparently growing cultural and natural homogeneity is announced is more borrowed than critically interrogated to determine its objective appropriateness. This paper seeks to determine this via an investigation of how the problem of exotic species is considered in the full-scale ecological restoration efforts devoted to Florida's Everglades.

Solidarity in a 'Special' Economic Zone: Rural Values and Urban Growth in Pithampur, India

is part of the Paper Session:

Critical Geographies of Contemporary Urban Transformations in Global South

scheduled on Tuesday, 2/28/2012 at 10:00 AM.

Author(s):

Pratyusha Basu* - University of South Florida

Abstract:

Special economic zones have been widely studied in terms of forms of labor control within them, including use of low-waged migrant labor and suspension of the right to form labor unions. Given this, it is important to understand the informal social relations that develop between workers within these zones, and the extent to which these either ensure greater control over labor or provide spaces for worker resistance. The case study for this paper is Pithampur, a rapidly urbanizing industrial area near the city of Indore in the state of Madhya Pradesh in central India. Located in a relatively underdeveloped region but connected by a sophisticated highway system to major ports, Pithampur draws on its rural hinterland to access a new migrant labor force that is both cheap and skilled. The social relations that construct Pithampur are the central focus of this paper, especially ways in which this industrial area is rendered socially cohesive through women's domestic labor which helps male workers cope with the rigors of factory shifts, and the encouragement provided by factory owners to recruit new workers from the places of origin of existing workers. Overall, this paper argues that urban economic development in Pithampur occurs not only in the absence of labor laws, but through dependence on community-based forms of solidarity, partly derived from rural values. While informal solidarity networks likely prevent labor discontent in the short-run, the extent to which they provide a long-term means of labor control remains to be seen.

Hispanic Heterogeneity and Environmental Injustice: Intra-ethnic Patterns of Exposure to Vehicular Air Pollution in Miami

is part of the Paper Session:

Social Justice on the Move: Transportation, Equity, and Environment

scheduled on Monday, 2/27/2012 at 14:40 PM.

Author(s):

Sara E Grineski* - University of Texas at El Paso

Jayajit Chakraborty* - University of South Florida

Timothy W Collins - University of Texas at El Paso

Abstract:

The majority of quantitative environmental justice (EJ) studies have analyzed racial/ethnic disparities between non-Hispanic whites, non-Hispanic blacks and Hispanics. This implicitly assumes a degree of intra-racial/ethnic homogeneity that may not exist, especially in immigrant gateways like Miami, Florida. While Hispanics comprise 39% of the Miami-Fort Lauderdale-Pompano Beach Metropolitan Statistical Area's population, substantial heterogeneity exists within this group. The five largest Hispanic country-of-origin subgroups - Cuban (42% of the Hispanic population), Puerto Rican (10%), Colombian (9%), Mexican (6%) and Nicaraguan (6%) - inhabit different parts of this city. To explore intra-ethnic diversity in patterns of environmental injustice in this MSA, we related cancer risks from exposure to on-road pollutants from the 2005 National-scale Air Toxics Assessment (NATA) with the 2005-2009 American Community Survey tract-level estimates. We selected the on-road category because it comprises the largest share (54%) of local, known sources of cancer risk in the NATA. We began with a traditional EJ spatial regression model and disaggregated the Hispanic population into subgroups in a second model. In the first model, neighborhoods with lower incomes and higher proportions of Hispanics and non-Hispanic blacks were at risk. In the second model, we found divergent patterns of risk for Hispanic neighborhoods based on country of origin. Cuban and Nicaraguan neighborhoods faced significantly increased cancer risk while Mexican neighborhoods faced significantly decreased risk. These analyses reveal divergent patterns of environmental injustice based on the Hispanic ethnic group, which connects to the differing migration and settlement patterns of Hispanic subgroups in Miami. (NSF grants: CMMI-1129984/1130191).

Advancing Environmental Justice Research: An Expanded Framework for the Analysis of Distributive Injustice

is part of the Paper Session:

Use of Geospatial Technologies in Addressing Humanitarian and Social/Environmental Justice

scheduled on Sunday, 2/26/2012 at 16:40 PM.

Author(s):

Timothy W Collins* - University of Texas - El Paso

Jayajit Chakraborty - University of South Florida

Sara E Grineski - University of Texas at El Paso

Abstract:

In recent decades, distributive justice issues have become important in risk assessment of environmental hazards. Spatial analyses of environmental injustice typically use secondary data to determine if socially vulnerable populations, usually defined by racial/ethnic and socioeconomic attributes, are disproportionately burdened by risks associated with technological hazards. While numerous studies indicate that these groups experience disproportionate exposure to hazards, research on distributive environmental justice suffers from several limitations: an incomplete conception of risk as hazard exposure, which neglects people's capacities to mitigate risks; an underlying assumption that people aim to avoid hazards, which neglects other factors influencing residential decision-making such as locational benefits; a methodological reliance on aggregated secondary data, which neglects household level factors and processes; and an exclusive focus on a single type of hazard in a given study area, which fails to clarify general determinants of exposure to different types of hazards across particular sites. This paper presents a conceptual framework to address these limitations and advance knowledge of sociospatial influences on exposure to hazards. While the literatures on environmental justice and hazards currently diverge in terms of how risk is conceptualized, our framework integrates these sub-fields to provide innovative insights on relationships between social vulnerability and hazard exposure. The framework is comparative and multiscalar, and demands the use of multiple research methods. An example of framework implementation is provided based on a research project currently underway, which involves parallel analyses of two high-impact hazards—air pollution and flooding—in Houston, Texas and Miami, Florida. (NSF grants: CMMI-1129984/1130191).

A Comparative Analysis of High Resolution IKONOS and WorldView-2 Imagery for Mapping Urban Tree Species

is part of the Paper Session:
Remote Sensing of Urban Forest and Ecology

scheduled on Saturday, 2/25/2012 at 16:40 PM.

Author(s):

Ruiliang Pu* - University of South Florida
Shawn Landry - University of South Florida

Abstract:

Mapping urban forest tree species has benefitted from advances in remote sensing techniques and satellite imagery sensors. In this study, we compared the use of high resolution IKONOS (IKO) and WorldView-2 (WV2) imagery for identifying and mapping urban tree species in the City of Tampa, FL, USA. Six species/groups were mapped, including: laurel oak (*Quercus laurifolia*), live oak (*Q. virginiana*), pine (species group), palm (species group), camphor (*Cinnamomum camphora*), and magnolia (*Magnolia grandiflora*). Image-objects (IO) were used as the tree species mapping unit. A step-wise masking protocol was developed to separate sunlit and shadow/shaded tree canopy IOs prior to tree species mapping. Comparative analyses examined tree species mapping accuracies (AA) between pan-sharpened 4-band IKO imagery and three different band combinations of WV2 imagery: four "traditional" bands (WV2-4Trad), four additional bands (WV2-4Add), and 8-band (WV2-8Band). Linear discriminant analysis was used to classify IOs using 15 spectral, textural, and shape/spatial IO features derived from 4-band combinations (i.e. IKO; WV2-4Trad; WV2-4Add), and 23 IO features from WV2-8Band. Results indicate significantly improved mapping accuracies using all combinations of WV2 imagery ($p < 0.01$). Compared to IKO sunlit and shadow/shaded IOs, average accuracy (AA) was 6.3% and 7.3% higher using WV2-4Trad; 12.1% and 4.9% higher for WV2-4Add; and 14.0% and 15.0% higher for WV2-8Band, respectively. The best result was obtained using WV2-8Band sunlit IOs (AA = 61.8% and Kappa = 0.514). Improved results with WV2 could be attributed to WV2 image improvement at spatial resolution (4 m to 2m) and with additional bands (coastal, yellow, red-edge and NIR2).

A Theory of Social Agentivity and Its Integration into the Descriptive Ontology for Linguistic and Cognitive Engineering

is part of the Paper Session:

Geospatial Ontology and Knowledge Management I: image processing, visualization, and cognitive engineering

scheduled on Saturday, 2/25/2012 at 12:40 PM.

Author(s):

Heath Robinson* - University of South Florida

Abstract:

The agentivity of social entities have posed problems for ontologies of social phenomena, include geopolitical phenomena, especially in the Descriptive Ontology for Linguistic and Cognitive Engineering (DOLCE) designed for use in the semantic web. A theory is elucidated by which physical and social objects can take action, but that also recognizes the different ways in which they act. It introduces the "carry" relationship, by which allows social actions to occur when a physical action is taken in the correct circumstances. For example, a certain individual's physical action of making markings on a sheet of paper may carry the social action of one state agreeing to a treaty with another. This article shows how a system can simultaneously and in a noncontradictory manner handle statements and queries in which both nonphysical social agents and physical agents take action by the carry relationship and the use of representatives. This is especially important for future semantic geographic information systems which users might query for actions taken by nonphysical geopolitical entities as well as for actions taken by their physical representatives. A revision of DOLCE's taxonomic structure of perdurants is also proposed, which divides perdurants into physical and nonphysical varieties at the same ontological level as the endurants are so divided is proposed.

From the Ruins of Time and Space: A Critical Postcolonial GIS of Dublin in Flann O'Brien's 'At Swim Two Birds' (1939)

is part of the Paper Session:

Qualitative GIS Symposium V: Practice and Methods

scheduled on Saturday, 2/25/2012 at 10:00 AM.

Author(s):

Charles B Travis* - University of South Florida

Abstract:

Flann O'Brien's *At Swim Two Birds*, (1939) serves as an avant-garde guide to the streetscapes and zeitgeist of post-colonial Dublin in the 1930s, and illuminates the perspective that 'one man's city is the sum of all the routes he takes through it, a spoor as unique as a finger print' (Raban: 1998). Critics have observed that O'Brien's *mise en abîme* reflects the concentric enfolding of modern urban events, and suggested that the very geography of Dublin, with its fiercely independent villages and suburbs, may have served as the template for its multiple narrative lines and spaces (Hasset, 1994; Kiberd, 2001). Therefore by engaging the theoretical lenses of Giambattista Vico's 'Historical Arcs' and Mikhail Bakhtin's 'Historical Poetics' within a Geographical Information System (GIS) application, I will illuminate the technology's capability to engage the perspectives of history, critical thought and literature. Inspired by the Dadaists and the Surrealists, as well as the critical interventions of Henri Lefebvre, Walter Benjamin and Guy DeBord and the Situationists - this paper will engage in a methodology which draws upon psychogeographical practices to explore and map *At Swim Two Birds'* multi-dimensional, hyper-urban postcolonial perspective.

Street Tree Management in Urban Neighborhoods: Resident Attitudes and Drivers of Uneven Tree Distributions

is part of the Paper Session:

Trees in the City 1:the extent, drivers, and benefits of urban forests

scheduled on Monday, 2/27/2012 at 12:40 PM.

Author(s):

Shawn Landry* - University of South Florida

Jayajit Chakraborty - University of South Florida

Abstract:

Street trees exist within the blurred private-public space of the right-of-way and represent a highly managed landscape feature of urban socioecological systems. Although they are an important part of the urban forest landscape and provide valuable ecosystem services, the biophysical characteristics of the right-of-way and actions of human and non-human management agents have resulted in an uneven spatial distribution of street trees within many cities. There remains a knowledge gap in our understanding of how the social, built and bioecological interactions in the public right-of-way impact urban environmental change. The broader goal of this research is to investigate the socioecological determinants of street tree distributions in urban residential neighborhoods in order to understand how household decisions and multi-scalar management agents shape urban forest change and the environment within the public-private space of the right-of-way. The specific objective of this paper is to determine: (1) which management agents are the strongest predictors of recent changes to street tree distributions and how the contribution of these agents vary in relationship to socioecological patterns within a city; and (2) if household street tree management decisions are related to the built and bioecological material characteristics of the public right-of-way. We present preliminary results from a social survey of single-family households in Tampa, Florida that asked residents about their recent efforts and attitudes toward street tree management. Results will be discussed in the context of quantitative measurements of the extent and temporal change in tree cover within the right-of-way associated with the respondent's household parcel.

Urban Heat and Environmental Justice: A Case Study in St. Petersburg, Florida

is part of the Paper Session:

Use of Geospatial Technologies in Addressing Humanitarian and Social/Environmental Justice

scheduled on Sunday, 2/26/2012 at 16:40 PM.

Author(s):

Bruce C. Mitchell* - University of South Florida
Jayajit Chakraborty - University of South Florida

Abstract:

While quantitative environmental justice(EJ) research has focused primarily on inequities in the distribution of industrial pollution and undesirable land uses, biophysical hazards such as urban heat have received limited attention in this literature. Urban heating and its adverse effect on human populations is an increasingly relevant public health problem, and heat waves represent one of the leading causes of weather-related mortality in the U.S. and worldwide. This paper seeks to determine whether levels of urban heat, measured as land surface temperature (LST), are distributed inequitably with respect to race, ethnicity, and socioeconomic status in Pinellas County--the most densely populated and one of the most racially segregated counties in Florida. Our case study utilizes census tract and block group level socio-demographic data from the 2000 U.S. Census. Landsat 5 TM thermal data from 2001 is processed using the mono-window algorithm to determine average LST levels for tracts and block groups in this county. Bivariate correlation and multivariate regression analyses indicate significantly greater LST levels in neighborhoods with a higher proportion of African-Americans and lower income individuals. Historical settlement patterns have spatially concentrated African-American residents near the center of the southern Pinellas peninsula, a commercial area with substantially greater LST levels compared to coastal neighborhoods that are characterized by higher income residents. Our findings underscore the need to consider urban heat as an important EJ issue and formulate appropriate policy solutions for addressing its unequal distribution in metropolitan areas.

Geographic Insights into American Exceptionalism

is part of the Poster Session:

People and Place

scheduled on Monday, 2/27/2012 at 10:00 AM.

Author(s):

Christopher Metzger* - University of South Florida

Abstract:

Through the tumultuous years of the last decade, one thing that has remained ideologically steadfast, if not bolstered, is American exceptionalism. In the face of a weak economy, numerous wars, a crumbling infrastructure, battered ecosystems, and depleted resources, many Americans are still convinced that America is number one. This project will test American exceptionalism by illustrating categories (economic, energy, education, technology, healthcare, justice, social, infrastructure, pollution, biodiversity) in which Americans can legitimately claim to be exceptional, and those in which they cannot, shown in juxtaposition to the international community. Information and rankings, gathered from various national and international indices, will be employed to illustrate the disparity between America's perception of itself and the more humbling reality of America's place in the world.

Location Modeling of Wildlife Crossings: Application of MCLP for Florida Panther Conservation

is part of the Paper Session:
Location analysis and modelling

scheduled on Monday, 2/27/2012 at 12:40 PM.

Author(s):

James H Anderson* - University of South Florida

Abstract:

Roadway mortality is of significant concern to endangered Florida panther populations in southern Florida. Wildlife crossing structures are an effective method for reducing collisions between vehicles and panthers, although high construction costs limit the number that can be implemented in practice. Therefore, optimizing the placement of crossing structures in road networks is suggested as a strategic conservation method. This research explores the use of the maximal covering location problem (MCLP) to determine optimal sites to install wildlife crossing structures based on panther roadkills recorded during 1979-2010 in Hendry, Collier, and Lee Counties. The model's objective is to cover the maximum number of collision sites given a specified number of structures to locate and the locations of 12 existing crossing structures. Coverage is defined based on a specified network distance that represents the length of road for which each structure is expected to attract usage by panthers. The results show that the majority of the 132 collision sites are not covered by existing crossing structures, and—depending on the coverage distance—an additional 12 crossing sites can cover up to half of the collisions.

Assessment of Urban Growth Using Multiple Endmember Spectral Mixture Analysis: A Case Study in Tampa, Florida

**is part of the Paper Session:
Geographical Applications of Remote Sensing (II)**

scheduled on Tuesday, 2/28/2012 at 10:00 AM.

Author(s):

Fenqing Weng* - University of South Florida

Ruiliang Pu - University of South Florida

Abstract:

The advance in remote sensing technology makes people easily assess urban growth. In this study, we will examine the utility of multiple endmember spectral mixture analysis (MESMA) in a subpixel analysis of Landsat Thematic Mapper (TM) imagery to map urban physical components in Tampa, FL. The three physical components of urban land cover (LC): impervious surface, vegetation and soil, were compared using the proposed MESMA with a traditional spectral mixture analysis (SMA). MESMA decomposes each pixel to address the heterogeneity of urban LC characteristic by allowing the number and types of endmembers to vary on a per pixel basis. This study generated 642 spectral mixture models of 2-, 3-, and 4-endmember for each pixel to estimate the fractions of impervious surface, vegetation, soil, and shade in the study area with a constraint of lowest root mean square error (RMSE). A comparative analysis of the impervious surface area (ISA) derived using MESMA with SMA demonstrated that MESMA was more accurately mapping urban physical components than SMA. The mapping accuracy was up to 87.4% within the 2.5% RMSE constraint using MESMA. With the multiyear Landsat TM data, we quantified subpixel percent ISA to estimate urban growth in Tampa, Florida during the past twenty years. This work demonstrates that MESMA approach is effective in mapping and monitoring urban growth at subpixel level using moderate-resolution multispectral imagery.

* Presenting author.