Abstracts

Poster Sessions

Annual Meeting
SEDAAG
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Comparing the Technical and Financial Water Resources Management Indicators in West Bank and to the Gaza Strip

Dr. Kamal Alsharif

The research addressed water resources management in the West Bank and Gaza Strip from 1999 to 2002. Despite the fact that both regions are considered part of the Palestinian Territories there are tremendous differences between the West Bank and the Gaza Strip in water resources management. Most municipalities showed a deficit in the water sale in Gaza Strip compared to the West Bank. The majority of customers owed money to their respective municipalities from 1999 to 2002. The percentage of revenue collections declined in the same four-year period in the West Bank and Gaza Strip. One exception was the Gaza Strip in 2000. Overall, the unit profit for the municipalities was negative for the Gaza Strip and positive for the West Bank in 2001 and 2002. This is an indication of the average for all of the municipalities studied in the West Bank and Gaza Strip regardless of the size of the municipality and the population served. The specific water consumption has been steadily increasing in the Gaza Strip and decreasing in the West Bank. Nevertheless, in both West Bank and Gaza Strip municipalities, the specific water consumption has been than the World Health Organization recommendation of 100 liters per capita per day.

Comparison of a Civil War Map of Amherst and Nelson Counties, Virginia, with U.S. Census Records Using GIS

Rebecca K. R. Ambers
Department of Environmental Studies, Sweet Briar College

Lt. C. S. Dwight's map of Amherst and Nelson counties in central Virginia made during the Civil War is richly detailed, including both natural and cultural features such as topography, forest cover, roads, dwellings, and mills. The level of detail on the map implies that its accuracy is fairly high. A scanned image of the map was brought into a GIS, georeferenced, and digitized so that map features could be systematically compared with U.S. Census records from 1860. Summaries and manuscripts of the population, manufacturing, and agricultural censuses for the two counties were consulted. Results indicate notable discrepancies between the map and census records. For example, mapped forested area shows no clear correspondence to non-farmland on the census. Likewise, the number of mapped mills and tan yards is much higher than census numbers for these establishments but similar to the number of millers and tanners. While this map provides a valuable overview of the 1860s landscape, closer inspection reveals that the devil is in the details.

Revisiting "the South" and "Dixie": A Spatial Pattern Analysis of Vernacular Regions using GIS

Shrinidhi Ambinakudige
Department of Geosciences
Mississippi State University

Abstract

John Reed's maps of the South and Dixie in 1970s and 1980s indicated the shrinkage of boundaries of these two vernacular regions. Using electronic telephone directories, this study collected all business names with "Southern" and "Dixie" in all the cities in the U.S. Kernel density analysis was to identify the number of occurrences of the terms per unit area. The LISA analysis was used to identify the clusters of high and low values of normalized values of the terms. These analyses have helped to identify the current core regions of Dixie land and the South. The results indicate that for both "the South" and "Dixie" boundary erosion is noticeable. Study identified an Island of "Dixie" in Utah, Arizona border which was unnoticed earlier. Results suggest that it is now appropriate to call Dixie land as Dixie Islands.

Keywords: Dixie, South, Kernel Density, LISA

THE RISE AND FALL OF OCEAN PEARL HIGHWAY

ANDREW BENNETT, EAST CAROLINA UNIVERISTY

The Currituck Banks, the last ten miles of Outer Banks in North Carolina, embody a landscape that is the remnant of an odd history of events. In the 1960s, the area was poised to become a sandy suburb of Virginia Beach. The area was subdivided, and canals were dug on the bay side, with bulkheads put in for small pleasure craft. There were easements made for the creation of a highway that would one day extend from the Currituck Banks to the shores of Virginia and connect it to the North American road network; they would call this road Ocean Pearl Highway. Then at the end of the decade, the road through the Back Bay Wildlife Refuge in Virginia was closed by the US Fish and Wildlife Service. This effectively cut the landscape off from the North American road network and killed any possibility of the creation of Ocean Pearl Highway. After the closing of Back Bay National Wildlife Refuge the Currituck Banks was designated by Congress as a Coastal Barrier Resource Act zone; meaning that federal grants and programs are not available, including federal flood insurance. There are currently no paved roads on the Currituck Banks where only 19% of the land is currently build on. The only access to the banks today is by four-wheel driving on the beach in North Carolina, which is permitted year round. Remnants of sandy paths known as Ocean Pearl Road are the only remaining links that exist of Ocean Pearl Highway across the Currituck Banks. The Purpose of the poster is to show how Ocean Pearl Highway and development of the Currituck Banks has been affected due in part to government restraints on access.

POSTER ABSTRACT

Engaging the Virtual Landscape: the Spatial Experience Engine and historical landscape reconstruction

Susan J. Bergeron

Dept of Geology and Geography

West Virginia University

The nature of historical data and historical research in general provide unique challenges within the context of GIS. Recent advancements in geovisualization, immersive environments, and even virtual reality offer the opportunity to generate digital representations of the cultural and physical landscapes, and embed those virtual landscapes with information and knowledge from multiple sources. The development of these technologies and their application to historical geography research has opened up new opportunities to synthesize historical records from disparate sources, represent these sources spatially in a digital form, and embed the qualitative data that is often crucial to historical interpretation. This poster illustrates the development of a serious gaming-based virtual world engine, the Spatial Experience Engine, that utilizes the state-of-the-art videogame graphical rendering and navigational capabilities of Microsoft's XNA Game Studio to create interactive and immersive virtual reconstructions of landscapes. Using the case study of an early 20th century urban landscape, this project demonstrates the implementation of the Spatial Experience Engine to create a digital reconstruction of Morgantown's physical landscape, embedded with additional historical and modern data in the form of multimedia.

Sweet Tea: mapping a foodway in the U.S.

Ronald Bertucci and Joby Bass
The Department of Geography and Geology
The University of Southern Mississippi

Understanding patterns of the preparation and consumption of different types of foods can offer insight into other cultural processes. This poster illustrates the distribution of the consumption of one food – 'sweet tea' – in the United States, examining the distribution and addressing its relationships to larger political and economic processes.
Using a popular international restaurant chain that has locations in every state and offers sweet tea, we called between one and four locations per state and were able to ascertain the distribution of customer demand and establish a regionalization of this cultural practice. The pattern of consumption of these two colonial plantation crops points to links between local cultural practices and larger global economic and cultural processes.

"What on Earth are we doing here?:
A descriptive morphology of the Wrightsville Beach-Masonboro Island sediment system, North Carolina"

Barrier islands represent dynamic systems within coastal environments. These systems are inherently mobile and can be susceptible to persistent and widespread erosion. The morphology of barrier islands is governed by many natural processes and variables, both long-term and short-term (Benedet, 2004; Cooper and Pilkey, 2004; Stockdon *et al.*, 2007). Concurrently, these systems are subjected to human influences as a result of development that exists on many coastlines. The goal for humans has been to make these dynamic and actively changing systems sustainable for development by erecting stabilizing structures, such as seawalls, bulkheads, jetties, groins, and breakwaters. Such extensively developed barrier islands operate under modified conditions (Nordstrom, 2000). The modification of the dynamic relationships within barrier island systems by human development and intervention further complicates and distorts the morphology of the natural system. This added complexity increases the need for understanding the processes responsible for shaping the morphodynamic framework of developed barrier island systems. To ensure sustainable development requires research that focuses on identifying, defining, and understanding these barrier systems.

The barrier islands of Wrightsville Beach and Masonboro Island are located along Onslow Bay in southeastern North Carolina (New Hanover County) (**Figure 1**). Masonboro Island is void of development aside from a rock jetty at its northern terminus, flanking Masonboro Inlet that separates the two islands. Masonboro Island is accessible only by boat and constitutes part of the National Estuarine Research Reserve (NERR). Wrightsville Beach, on the other hand, is almost entirely developed and began to be developed over 100 years ago. The fundamental differences between these two barrier island systems make them excellent examples for comparing processes

and morphology. Likewise, their juxtaposition, thus experiencing very similar environmental conditions, permit accurate comparisons for representing the effects of development, differences relative to one another, and interactions between the two systems.

The focus of this study is to define and quantify the topographic and morphologic changes that have occurred in the past decade (1998-2008) for Wrightsville Beach and Masonboro Island. These changes will be measured based on available LIDAR (**LI**ght **D**etection **A**nd **R**anging) data (1998-2006) and most recently by GPS surveys (2008). These two sources of data will provide the ability to measure lateral and volumetric changes in morphologic units for the past ten years and how they compare between the two islands. Morphologic units will include the beach, measured from mean high water line (MHWL) to the dune toe (2.5m *msl*), and the dune, measured as anything ≥2.5m *msl*. Defining these units from an elevation allows areal, volumetric, and lateral extent calculations to be made between years from the LIDAR and GPS surveys. Finally, details on beach nourishment projects (e.g. design, volume) and storms (e.g. intensity, proximity, frequency) will be assembled to help provide an explanation for the behavior that is to be found by comparing morphologic change through time.

The questions posed to help answer how these barrier systems have behaved between 1998-2008 include:

1) What gross subaerial, morphologic changes in volumetric, areal, and lateral extent exist within the system from 1998-2008?
2) How do volumetric, areal, and lateral extents compare between the barriers at equi-distant points from Masonboro Inlet?
3) What roles have beach nourishment and storms played in controlling the morphology of the two barriers?

Name: Gillian Breary

Supervisor: Dr. Charles Roberts

School: Department of Geosciences, Florida Atlantic University

Topic: Mapping Urban Growth in Boca Raton over a Thirty Year Period

Urban growth is a growing issue in many countries across the world. It has had both its positive and negative effects. It has led to a number of issues including: uncontrolled population growth, which has led in turn to loss of agricultural lands, and disruption of the ecological cycle. Therefore, monitoring urban growth is essential as this will aid in implementing appropriate measures to mitigate the negative effects of urban growth.

The purpose of this poster is to show the mapping of urban growth in Boca Raton, Florida over a period of thirty years, using textural analysis and tinted overlays over a 2004 Landsat TM image. The multi-temporal analysis utilized five Landsat images obtained from SE Florida between the years 1973 to 2002. The satellite images that are used in this study includes. 1973 MSS (Multi- spectral scanner), 1978 MSS, 1986 TM (Thematic Mapper), 1995 TM, and 2002 TM. Each time period have been colour coded, giving an indication of each growth period and the extent of urban growth which occurred in each of these time periods. This will give the observers the ability to easily analyze the process of growth that occurred in Boca Raton during this specified time period.

Textural analysis is a technique that has become important in assessing landcover/landuse systems. Geographical Information Systems (GIS) and remote sensing provide the tools with which one can do this. Aerial photographs interpretation has been and continues to be the standard tool for the mapping and the interpretation of landuse/ landcover at detailed scale. Satellite imagery classification is based on the reflectance value of the imagery (C. Roberts 1992). More recently researchers have used textural features in combination with spectral information to carry out landcover mapping and have received positive results.

In this study, supervised classification was performed on all five images, to delineate urban and non-urban areas. The classification was performed in Erdas Imagine,

after which they were imported into ArcMap where the urban areas were then separated from the non-urban areas. The urban areas for the various periods were then unioned together to determine the growth that had occurred between the various periods. Therefore, the growth periods are: 1973, 1973-1978, 1978-1988, 1988-1995 and 1995-2004. An appropriate transitional colour ramp ranging from red to light yellow was selected to represent each growth periods. From these coloured growth periods, the tinted overlays were created overlaying a 2004 Landsat TM imagery and having a transparency of 35%. The percentage of transparency was selected because it proved just appropriate that it would allow the observer to see the underlying urban areas underneath and not too transparent that the tinted coloured overlays would not be easily detected.

The research shows how well textural analysis works when it is used to detect, map and interpret landcover/landuse in various areas.

An Analysis of Meteorological Variables Impacting Evacuation Decisions during Hurricane Gustav

David M. Brommer and Jason C Senkbeil
Department of Geography
University of Alabama

Abstract

In this study, evacuees from the path of Hurricane Gustav are surveyed to determine which meteorological variables most influenced their decision to leave. Specifically, surveys were conducted along two major evacuation routes within the 48-hour window prior to landfall to collect time-sensitive data on individual evacuation decisions related to the meteorological threats from Hurricane Gustav. Three regions were represented most frequently, as determined by zip code data collected from the surveys. They were the New Orleans area, the Houma, region, and the Lafayette region. Results from the analysis revealed evacuees from in and around New Orleans were driven to evacuate as a result of the perceived threat from storm surge associated with Hurricane Gustav. Locations near the Houma, Louisiana region were motivated to leave as a result of the size of Hurricane Gustav as well as by the tornado and heavy rain potential. Lafayette and surrounding locations were also most concerned with storm size, tornado, and heavy rain threats. These results reveal the local and regional concerns regarding meteorological variables associated with hurricanes that play a role in individual decisions to evacuate.

Sampling Convective Rainfall Rates in Relation

To the Distance from the Center of Tropical Storm Fay

Mario Cartaya

Kevin Ash

Department of Geography, University of Florida

Tropical Storm Fay made four landfalls while traversing Florida in August 2008, producing extreme accumulations of rainfall in the eastern and northern regions of the state. Previous studies of tropical cyclones have found that convective rain increases and concentrates near the center of an intensifying system. This study tests the reverse by sampling from two periods when Fay passed through a rain gauge network to see if convection decreases and expands away from a weakening system. As Fay makes its second Florida landfall southwest of Immokalee, rain rates are generally convective near the center of circulation and in a band ahead of the storm track near Fort Pierce. This trend persists through its first track across Florida, before becoming nearly stationary east of Cape Canaveral. During its third landfall and subsequent track west across Florida, rainfall is less convective near the center as the outer bands dominate the majority of recorded rainfall. This study demonstrates that a weakening tropical system accounts for less convective rainfall near the center as it disorganizes over land.

Public response to warnings during the Super Tuesday tornado disaster at Lafayette, Tennessee

Philip L. Chaney and Greg S. Weaver, Auburn University

This paper investigates public response to tornado warnings. The study was conducted one week after the tornado disaster that occurred at Lafayette, Tennessee, on February 5, 2008. The tornado (EF3) hit the community at 10:15 p.m. and left 13 dead, 44 injured. The post-disaster survey included 127 local residents. Most participants were aware of the warnings for the central Tennessee area; but many did not receive the warning for their home county because the tornado destroyed a key component of the local electric grid, which cutoff power to homes relying on local TV stations for reports. Thirty-three percent of the participants who were aware of the warnings rated their perception of danger as high, but forty-five percent did not believe they were in danger. The most common responses to the warnings were to seek shelter, look outside, call someone, and seek more information, which suggests that many people had a delayed response in seeking shelter. Sixty percent had an emergency response plan for seeking shelter, but most did not have any type of tornado-proof shelter at their home. Twenty-nine percent had previously been in a tornado disaster, but previous experience did not appear to enhance tornado awareness.

Abstract for submission of a poster presentation for the SEDAAG 2008 Meeting

Title:

Monitoring the hydrologic cycle of the Florida Everglades using Synthetic Aperture Radar

Authors:

Amy Cohen and Shimon Wdowinski

University of Miami, Coral Gables, FL

Water quantity is an important factor to consider in understanding hydro-period and hydro-pattern in the Everglades, as it indicates the presence or absence of water as well as the degree of inundation. Hydro-period refers to the annual duration of flooding and hydro-pattern to the observed annual patterns in changing water levels. Studies of hydro-period and hydro-patterns have applications in land-management decisions that involve the delineation and characterization of wetlands. They can also be utilized in the monitoring of anthropogenic forces on the hydrologic conditions of the Everglades. These are pertinent measures in light of Everglades restoration efforts that take into account how planning and management decisions have altered hydrologic conditions in the Everglades, how this has affected the ecosystem, and the steps that can be taken to reduce the processes that change the natural hydrologic conditions in the area. The purpose of this study is to provide useful mapping products to researchers and planners focusing on such issues.

We explore the use of Synthetic Aperture Radar (SAR) as a tool for remotely monitoring hydro-period in the Florida Everglades. We use SAR data from three separate platforms (ERS, Radarsat, JERS) in conjunction with ground stage data to assess the relationship between SAR backscatter and changes water level, the results of which we apply to the development of a method of hydro-period classification. We derive water level data from a network of approximately 200 automated ground stations. The resolution at which discrete water level values can be interpolated across the continuous Everglades landscape is restricted to station density. SAR data analysis provides additional information that increases the ability to determine hydrologic conditions at a finer resolution. This research builds on previous work relating radar backscatter to ground features such as changing water levels and vegetation types. In order to further develop the framework established by existing research on SAR and wetland environments, we analyze a series of profile lines traversing the Shark River Slough, a wetland depression in the Everglades National Park. This area experiences a large variation in seasonal inundation patterns, which makes it

particularly useful for observing backscatter patterns in a range of dry to wet conditions. Another indicator of water level change considered in this study is the standard error of backscatter values for each individual pixel using a 5x5-pixel window. Using both the previously established correlation between SAR backscatter and water level and the additional results of our analysis of standard error, we develop a classification method that uses SAR data to determine water levels on the ground in the Florida Everglades.

The Jewish Experience in the American South

Laura Coppola, Department of Geography and Earth Science, UNC Charlotte

When one thinks of the south, Jewish culture is not among the things they think of. This poster aims to present information on the history of Jewish culture in the American south, including historic synagogues, the only Jewish military cemetery outside of Israel, and a museum devoted to the subject. Along with these sites, the mixing of the two cultures will be examined, through holiday celebrations and recipes. It includes shorthand on Jewish culture for Gentiles including some basic Yiddish, and some pertinent concepts, such as Kosher, Mezuzahs, and Graveside Customs.

Impact of Urban Redevelopment Policies on Slum Growth in Ahmedabad, India

Crane

Abstract

This poster highlights the effect of urban development policies on slum growth in Ahmedabad, Gujarat. The study uses visual analysis of images from participant observation of the destruction of a slum neighborhood for the Sabarmati Riverfront Development Project, and uses census and municipal city data to indicate that the observed neighborhood is representative of other slum areas on the Sabarmati riverbank. The study questions the benefits of the neighborhood's destruction when compared with the history of former Ahmedabad slum development projects, including the Sanjay Nagar and Chamundanagar Projects. Findings indicate that riverfront slums possess more stability than displacement will cause, and riverfront slum neighborhoods possess neighborhood characteristics of established shelters, community support systems, and occupational diversity even with limited water, sanitation, and ancillary physical infrastructure.

Abstract

The influence of urbanization and land use change on exotic plant invasions

Amy J.S. Davis and R.K. Meentemeyer

Urbanization is an active agent of disturbance to natural ecosystems through land cover change, introduction of exotic plant and animal species, and declines in biodiversity. Several studies have documented that exotic plant species richness and abundance is higher in urban areas, but little work has been done to document the mechanisms that may account for this phenomenon. This study seeks to elucidate the underlying mechanisms influencing woody species diversity patterns along an urban to rural gradient in the Charlotte Metropolitan region by 1) testing the degree to which propagule abundance in the seed bank explains variation in exotic plant species richness and abundance; 2) determining if habitat limitations such as biotic or abiotic resistance can be overcome by an invader's propagule abundance; and 3) determining if human-mediated shifts in landscape heterogeneity over time influences woody plant diversity and propagule pressure. Abiotic (e.g. soil, light availability) and biotic (e.g. woody plants species richness and abundance above ground and in the seed bank) variables are being measured at 100 modified Whittaker plots (20m x 50m) in a range of urban to rural forest conditions using stratified-random sampling in a GIS along a gradient of development history and pressure. One anticipated outcome of this work is a better understanding of the degree to which contemporary ecological factors versus habitat history affects invasion dynamics and plant species diversity.

Dewese,

Evaluating the Dendrochronological Potential of Central Appalachian Table Mountain Pine (Pinus pungens Lamb.) in Climate Reconstructions

Table Mountain pine (*Pinus pungens* Lamb.) is an Appalachian endemic that occurs in a patchy distribution from Georgia to Pennsylvania on xeric, fire-prone sites. Beginning in the 1990's, Table Mountain pine first showed usefulness in reconstructing fire regimes in these xeric Appalachian forests. The next step in Table Mountain pine research, the relationships between fire occurrence and climate variables, cannot happen until the dendrochronological potential of the species has been proven. This research investigates the annual ring structure and formation, relationship between climate and growth and dendrochronological dating between trees in the same stands to prove the species' effectiveness in climate reconstructions. Table Mountain pine cores and cross sections were collected from four sites in the Virginia Appalachian Mountains. Results indicate that the species is sensitive to climate (monthly precipitation and temperature, PDSI and PHDI). Climate analyses revealed that Table Mountain pine growth is reduced when the previous year's September is drier than normal, the current year's February is wetter than average, and the winter is colder than average. Results of these climate analyses illustrate a regional climate signal in Table Mountain pine stands.

Forecasting development in the Greater Uwharries: Outcomes of status quo and conservation-based planning scenarios

M. Dorning, D. Shoemaker, R.K. Meentemeyer

The Greater Uwharries region is defined by a biologically diverse national forest, superior water quality, and numerous natural heritage areas making it a high priority for conservation within the North Carolina piedmont. However, its close proximity to the sprawling urban areas of Greensboro, Raleigh, and Charlotte has made it imperative that we forecast impending development and its potential implications for the local environment. We have created a spatial model of land-use change based on current growth trends and statistically significant predictors of development probability. We are now using this model to examine how development trends could vary in the presence of various conservation planning scenarios versus the historical trajectory. The results of this study will be used to demonstrate the potential expansion of development in the region and to guide strategies for preservation of the region's biodiversity and ecosystem services. In the future, this model will be applied to predict specific environmental impacts of forecasted development. It could also be adapted to forecast development in other regions.

Title: Local Environmental Drivers of Cholera in Bangladesh and Vietnam

Background: Cholera infection is caused by ingestion of *Vibrio cholerae* from contaminated food or water. Environmental factors and population characteristics play indirect roles in the occurrence and severity of cholera outbreaks. Objectives: This paper examines the relationships between cholera and the local environment factors in Bangladesh and Vietnam. Methods: Ordered probit models examine associations between the environment and cholera severity in Bangladesh; probit models examine associations in two sites in Vietnam. Results: Increases in ocean chlorophyll concentration are related to an increased probability of severe cholera outbreaks in Bangladesh. Increases in sea surface temperature appear most influential in Hue, Vietnam. Conclusions: The local environment has unique effects on cholera; therefore, potential predictive models must be site specific and dynamic. However, the mechanisms through which the environment affects cholera are still unknown. Future investigations will measure the potential variation in cholera outbreaks related to both environmental factors and population characteristics.

Protect the rainforest by using it
Maria Fadiman, Florida Atlantic University

Understanding how people utilize the rain forest in terms of Non-Timber Forest Products is becoming increasingly important. This study looks at the use of a vine-like plant, *piquigua (Heteropsis ecudadorensis*) (Araceae) in the Mache-Chindul Ecological Reserve, Ecuador. As one of the hot spots of biodiversity, with only 5% remaining of this ecosystem in Ecuador, the area is of particular importance. Much can be understood about how groups utilize protected lands. The most common use is for weaving baskets, fans and as lashing material. *Piquigua* plays a vital role in maintaining the balance between forest use and conservation, because people can collect the plant sustainably. Furthermore, some villagers even protect the forest where *piquigua* grows, thus promoting rainforest conservation because of people using the vegetation.

Student Investigation of Spatial Changes in mid-Atlantic Coastal Plain Aquifers

Martin B. Farley[1], P. Lee Phillips[1], Rachel McBroom[2]

Departments of [1]Geology & Geography and [2]Biology
UNC—Pembroke

We have developed exercises for students to investigate the aquifers of the mid-Atlantic Coastal Plain. These use figures modified from the USGS Hydrologic Atlas. We modified the figures by omitting information (e.g., groundwater flowpaths) so the students can make their own interpretation. There are exercises on thickness of regional aquifers from North Carolina to New Jersey; effects of the Cape Fear Arch, Albemarle Embayment, and Norfolk High; flowpaths of groundwater in Cretaceous coastal plain aquifers before and after human withdrawals; and negative impacts of withdrawals, principally declining hydraulic head and saltwater intrusion. Students compare their interpretation in the biggest impact area (Greenville-Jacksonville, NC) to conclusions reached by N.C. DENR. The exercises allow students to investigate the Cretaceous aquifers at a regional scale and see deleterious effects such as saltwater intrusion that have not occurred in our area (yet).

Jet Stream or Jet Plane? The Effects of Climate on Influenza in the United States

Christopher M. Fuhrmann
Gretchen S. Carlson
Charles E. Konrad
Peter J. Robinson

NOAA's Southeast Regional Climate Center
Department of Geography
University of North Carolina at Chapel Hill

Abstract:

Influenza is one of the most deadly of all airborne and upper-respiratory infections. On average, over 36,000 deaths and over 1.5 million hospitalizations in the United States are attributed to influenza each year. Moreover, annual influenza epidemics can often have multi-billion dollar impacts on the United States economy. The distinct seasonality of influenza – a cold season virus with a peak in February – suggests a climate connection, but very few studies have examined this relationship with respect to large scale air mass and circulation regimes. Indeed, laboratory-based studies in the past four to five years have documented biological characteristics of the influenza virus and human respiratory system that appear to be sensitive to the environmental conditions conducive to transmission and infection. This poster aims to synthesize those aspects of the climate-influenza relationship on biological and atmospheric scales using a diagrammatical approach adopted from disease ecology and biometeorology. Proposed research initiatives resulting from this analysis are also discussed.

A Climatology of Extreme Weather Across the Southeast United States: Temporal Trends, Relationships with Circulation, and Human Impacts

Christopher M. Fuhrmann
Charles E. Konrad
Gretchen S. Carlson

NOAA's Southeast Regional Climate Center
Department of Geography
University of North Carolina at Chapel Hill

Abstract:

Extreme weather events have a substantial impact upon both human and natural systems. It is generally accepted that changes in the large scale circulation associated with climate change will have a large impact on the frequency and intensity of extreme weather events. Determining how extreme weather events will be impacted by climate change requires an understanding of the secular trends in their occurrence and intensity. At present, these trends are not well known, particularly over the southeastern United States where a wide range of weather events frequently occur throughout the year. A comprehensive archive of extreme weather events over the southeastern United States has been constructed for the period 1950-2008. Extreme events include cold air outbreaks, heat waves, dry periods, heavy rainfall, severe thunderstorms, tropical cyclones, and winter weather. These events are analyzed with regard to their temporal "clustering" pattern, their relationship to several standardized large scale circulation indices, and their societal impacts (namely fatalities and injuries).

Human impacts on a fluvial system; Hazel Run tributaries, Fredericksburg, VA

Jacqueline Gallagher & Joseph Nicholas
University of Mary Washington

Hazel Run is a tributary of the Rappahannock River that runs through Fredericksburg. It is experiencing changes in channel morphology thought to be related to rapid residential and retail commercial development throughout its watershed. In Alum Spring Park, Hazel Run is allowed to flow naturally, with unchecked meandering and tree falls. Our study focuses on two unnamed tributaries that join Hazel Run in this park, entering through culverts beneath an embanked railroad grade constructed between 1850 and 1870. Surveyed transects reveal that the western tributary has a rectangular cross-section, much of it in bedrock, which appears stable. The eastern tributary is a deeper, narrower alluvial channel, with steep and overhanging banks that is entrenching and eroding. The eastern tributary culvert is experiencing collapse; slopes above and east of it are failing. The condition of this tributary and its contiguous slopes is thought to be attributed to a new housing development upstream, adjacent to the park. We hypothesize that the western tributary will soon experience aggradation caused by very recent land clearance nearby. Periodic re-surveying will be necessary to test these hypotheses.

POSTER: Pentad Scale Variation of the Caribbean Mid-summer Drought and its Association with the North Atlantic High Pressure

Doug Gamble, Matt Ball, UNC Wilmington and Scott Curtis, East Carolina University

The purpose of this study is to refine the Gamble *et al.* (2008) analysis to the sub-monthly scale and extend the spatial coverage to include the Caribbean Sea with satellite precipitation data. The methodology of this study mirrors that of Gamble *et al.* (2008), a principal component analysis (PCA), except that it uses pentad scale data as opposed to monthly scale data. Comparison of maps of the MSD start, minimum, end, duration, and magnitude of each of the PCA components identifies three MSD regions, Eastern Caribbean, Central Caribbean, and Western Caribbean, across the study area. Correlation analysis indicates that a rise in pressure west of 80°W is strongly associated with low summer rainfall. In conclusions, this analysis at the pentad level is consistent with monthly scale analysis completed by Gamble *et al.* (2008). Both studies identified a westward progression of MSD development in the late spring and early summer. This study indicates that this process also occurs consistently over the Caribbean Sea. Overall this analysis further supports the theory of expansion of the NAHP into the area as the driving force for MSD occurrence.

POSTER

A comparison of stream power to channel change: The Leaf River, Mississippi and two tributaries

Ursula AB Garfield, Dr Joann Mossa – University of Florida

The purpose of this analysis is to compare river planform changes in the Leaf River, Bogue Homo River and Thompson Creek, MS to stream power. The measured changes in the river system were compared to stream power to determine if stream power is an important variable influencing change processes in human-impacted rivers. Change variables include change indices, lateral migration rates, change in point bar area, change in channel width and change in slope.

Other factors likely had a greater influence on lateral migration and channel change, including geological and vegetative resistance. Changes were most pronounced in areas where severe human impacts caused headcuts near junctures of very disturbed tributaries, where large pits were prone to avulsion and capture, and where bare surfaces with minimal vegetative protection contributed excess sediment during higher flows.

A Multi-method Geographic Analysis of Refugee Camp Impacts on Host Communities in Western Tanzania

Jake Gentry and Christopher A. Badurek
Department of Geography and Planning
Appalachian State University
Boone, NC 28608

Geographic factors play a major role in dictating the overall impact refugees have on host communities through the spatial relationships inherent to forced mass migration. This multi-method study examines the major benefits and burdens associated with hosting refugee populations in three Tanzanian host communities of the Great Lakes region of Africa with explicit focus on positive impacts refugees have on host communities. Previous research has indicated that presence of refugee camps in some developing countries may actually provide more benefits than burdens to host countries. To explore this issue, visits and interviews were conducted with members of communities located near three camps housing Burundian and Congolese refugees in Western Tanzania in July and August, 2008. Interviews with community members, heads of non-governmental organizations, and focus groups with village leaders revealed the existence of significant positive benefits to hosting communities. In particular, evidence of positive impacts such as expedited economic progression, increased availability of healthcare, and better transportation networks were found. GIS and remote sensing are also used to assess the extent of environmental degradation and to determine the effects of location on the extent of benefits received by host communities.

Indirect Protection due to Social Networks and Space in a Cholera Vaccine Trial

Sophia Giebultowicz, Elisabeth Root, and Michael Emch

Introduction

Clemens et al. (1996) questioned the utility of conventional vaccine trial methods, suggesting that public health practitioners cannot use traditional protective efficacy measures to make decisions about whether or not to immunize diverse populations. Many vaccine trials have produced conflicting results in different settings. The Ty21a typhoid fever vaccine, for example, had an efficacy of 96% in Egypt (Wahdan et al., 1982), 77% in Chile (Levine et al., 1990), and 53% in Indonesia (Simanjuntak et al., 1991). The underlying assumption in traditional vaccine trial methods is that the effect of the vaccine is the same throughout the trial area. A case study previously conducted by some of the authors tested whether this assumption is true for one vaccine trial using a spatially referenced database (Ali et al., 2005, 2007; Emch et al., 2006, 2007). The results illustrated that the protective efficacy of oral cholera vaccines varies across neighborhoods (Emch et al., 2007) and that the variation is inversely related to vaccine coverage (i.e., % of people vaccinated in an area) after adjusting for several ecological factors (Emch et al., 2006). It was also found that higher levels of neighborhood vaccine coverage are linked to lower risk of cholera among residents, both in placebo recipients, for whom a strong inverse relationship was observed, and in vaccinees, for whom a suggestive relationship is evident (Ali et al., 2005, 2007). These findings suggest that progressively higher levels of vaccine coverage can lead to higher levels of indirect protection of non-vaccinees, and may also lead to progressively higher levels of indirect protection that add to the direct protection of vaccines (Ali et al., 2005; Emch et al., 2006).

This previous work is extended here by considering the social networks that individuals belong to and assessing how vaccine efficacy is affected by these networks. This allows us to measure how protective efficacy and placebo group incidence varies due to social connections. As was learned in the initial study, conventional vaccine evaluation may be biased because of spatial variation in neighborhood-level vaccine coverage and different community-level characteristics. While a spatially-defined neighborhood can be used to calculate potential fecal-oral contact, social proximity is also likely to control contamination. Some of the authors found that the oral cholera vaccine confers indirect herd protection and that neighborhood vaccine coverage is related to both disease incidence and efficacy because of indirect protection. This initial model assumed that all people are just as likely to come into contact with one another within a given Euclidean neighborhood size. There are, however, many processes that modify distance. This study extends previous research by examining the role of social interactions. In this sense, we are considering the possibility that neighborhoods are not homogeneous and that some neighborhoods are more connected than others because of social (i.e., family network) connections. Our preliminary results show that an individual's social connectivity to other vaccines is significant in terms of individual cholera outcome; these findings have implications for future vaccine trials and will contribute to knowledge of effective vaccination methodologies. In addition, we plan to integrate spatial distance between connected individuals in order to assess how the effectiveness of indirect protection via social networks is modified by distance between actors in the network. This work is of interest to public health and vaccine trials, but also for social network research. It is an innovative way of using social networks to look at health outcomes, as they may have significance in how we define herd immunity and indirect protection through vaccination campaigns.

Research Objective, Question, and Hypotheses

Our objective is to develop theory and methods that utilize social and spatial information for use in future vaccine trials. We will answer the following question: How did the effectiveness of the cholera vaccines vary spatially and socially in the study area? This will be accomplished by (1) measuring relationships between neighborhood vaccinee and placebo incidence and neighborhood-level social and spatial variables, and (2) measuring relationships between neighborhood vaccine efficacy and social and spatial variables.

Our specific hypotheses build on findings from a previous study. In the initial study it was found that cholera incidence in the placebo group is higher in areas with lower neighborhood vaccine coverage and that there was an inverse relationship between coverage and efficacy. The authors thus concluded that herd immunity was important in neighborhoods with high coverage. In this research project we will extend these ideas by testing the following hypotheses:

H1: Protective efficacy and placebo group incidence are influenced by social networks because herd immunity is affected by how socially connected people are to one another.

H1a: Protective efficacy is negatively related to the number of social ties a person has with unvaccinated people.

H1b: Unvaccinated people who are socially connected to people who have been vaccinated will be at lower risk for cholera.

H1c: Unvaccinated people who are socially connected to people who have not been vaccinated will be at higher risk for cholera.

H2: The effects of indirect protection as a result of social networks are modified by spatial distance between the connected individuals,

Background and Significance

In 1985, a community-based individually-randomized oral cholera vaccine trial was conducted in Matlab, Bangladesh, the research site for the International Centre for Diarrhoeal Disease Research, Bangladesh (ICDDR,B). This double-blind trial measured the efficacy of two vaccines, the B subunit-killed whole cell (BS-WC) and the killed whole cell only (WC). The control agent was Escherichia coli K12 strain. Females aged 15 years and older and children aged 2 to 15 were the target groups in the trial (Clemens et al., 1990a). Three vaccine doses were given to 62,285 people in the target group in six-week intervals. The vaccine trial used a passive surveillance system to identify cholera cases from the study area. The surveillance took place at one hospital and two community-based treatment centers. During 5 years of follow-up, the protective efficacy was 49% for the BS-WC group ($P<0.001$) and 47% for the WC group ($P<0.001$). Protection was lower in children who were vaccinated at 2 to 5 years than in older persons. For children in this age group, protection waned after 4 to 6 months and was not evident at all during the third year. Vaccinated persons older than 5 years of age were protected even in the third year of follow-up (Clemens et al., 1990a).

This study reanalyzes the cholera vaccine trial data using social network information that allows us to stratify protective efficacy and placebo incidence by social confounders and effect modifiers. Confounders are factors other than the vaccine that could either increase or decrease the risk of a disease. Confounding also results when the vaccine is unequally distributed in the groups that are being monitored for whether or not they get the disease, thus resulting in differences in disease frequency in the compared groups. Confounders must be controlled for to ensure that the efficacy of the vaccine is measured correctly. An example of a confounder that was controlled for in the original vaccine trial is age; i.e., the efficacy measures were age-standardized and age-stratified. Other confounders might be spatial or social in nature. Effect modifiers are variables that modify the effect of the vaccine. There may be differences in the protective efficacy of the cholera vaccine in populations with one characteristic versus another. Some effect modifiers could be spatial or social in nature. For instance, protective efficacy of the vaccine might be worse near densely-populated groups of households that are connected to each other via ponds because there are more cholera bacteria in those water bodies and the vaccine might not work as well when exposure to the bacteria is greater. Conventional vaccine trials usually consider individual-level effect modifiers; however, some variables are best measured at the ecological level. For instance, neighborhood vaccine coverage (i.e., percentage of vaccinated people in a neighborhood) can only be measured at the ecological-level. Variables can also be defined spatially if a GIS database of a study area is available. For example, if a spatial database of households is available then we can measure how far apart the socially connected households are to one another. Different efficacy values could be calculated for areas with different levels of social connectivity to unprotected people. The original Matlab cholera vaccine trial did not consider spatial ecological variables describing the social and environmental circumstances in different parts of the study area.

The Matlab Study Area and GIS Database

The research site for the ICDDR,B and for this project is called Matlab because the Centre's hospital is located in Matlab Town. Matlab is in south-central Bangladesh, approximately 50 kilometers southeast of Dhaka, adjacent to where the Ganges River meets the Meghna River forming the Lower Meghna River. A demographic surveillance system (DSS) has recorded all vital events of the study area population since 1966; the study area population has been approximately 200,000 since that time. The database is the most comprehensive longitudinal demographic database of a large population in the developing world. The people of the study area live in clusters of patrilineally-related groups of households called *baris*. Two of the authors of this proposal (Emch and Ali) created a vector GIS database of the Matlab field research area (Emch, 1999; Ali et al., 2001a). Features in digital format include *baris*, rivers, health facilities, and a flood-control embankment.

This study uses retrospective vaccine trial data collected in Matlab from 1985 to 1990 (Clemens et al., 1986a, 1986b, 1987, 1988a, 1988b, 1988c, 1988d, 1989a, 1989b, 1989c, 1990a, 1990b, 1991, 1992; Durham et al., 1998; Sack et al., 1991; van Loon et al., 1996). The objective of this randomized double-blind, placebo controlled

trial was to determine whether three doses of BS-WC and WC vaccines reduces the incidence of laboratory confirmed cholera in 2 to 5 year old children and females over 15. The target group was individually randomized based on a simple random sampling scheme derived from DSS records. The Matlab GIS database includes an accurate *bari* location for all individuals living in the study area including all vaccinees, controls, people who refused vaccines, and everyone else living in the study area who was not part of the study. The GIS database also includes the locations of the treatment facilities that were used in the passive surveillance system for the vaccine trial. We have linked the individual level data from the vaccine trial to *bari* locations via the ICDDR,B DSS census identification number. The GIS thus facilitates the identification of the dwelling locations of individuals who participated in the clinical trial, as well as the entire population distribution of the Matlab study area.

Methods

For the initial phase of this study, we used demographic and migration data from the time period during which the vaccine trial was conducted to create a social network showing linkages between *baris*, representing the network that existed in the beginning phases of the vaccine trial. This was done based on knowledge of which *bari* an individual had originally resided in, as well as their current *bari* of residence[4]. If the two baris differed, it implied that the individual had migrated from one *bari* to another, thus forming a social linkage between the two. This is based on the assumption that an individual who moves from one *bari* to another still returns to visit members of his or her original household, and that those individuals may, in turn, visit him or her. We then created a node list which listed each *bari* in the trial and every *bari* that it was connected to at the time, via the migration of individuals. The lowest number of connections was zero and the highest number of connections was forty.

Each *bari* was then assigned three values, representing the number of vaccinated individuals, the total trial target population residing in the *bari*, and the total population of the *bari*. Summing these values, every *bari* had its own values of individuals residing within who fell into the vaccinated, target, and total population, as well as the sum of all vaccinated, target, and total populations that it was connected to via social linkages. The sum of each population within and connected to the *bari* was totaled to create a variable that represented the number of people that an individual living in a given *bari* could potentially come into contact with, classified by whether those people are vaccinated, target population, or total population. These values were then assigned to each individual based on their *bari* of residence. These variables also allowed us to create percentages representing the vaccine coverage rate within an individual's social network, or the number of people they are connected to who are vaccinated over the number of people they know within the target or total population.

We then integrated these variables into the ecological model used in a previous paper written by some of the authors (Ali et al, 2005) in place of the neighborhood vaccine coverage variable. This model controls for confounding demographic variables known to be associated with the risk of cholera in Matlab. We evaluated whether there is a relationship between vaccinee/placebo incidence and social connectivity by calculating Spearman's correlation coefficients between groups of *baris*, ordered according to ranges of connectivity and rates of cholera among residents of these groups of *baris* (see Ali et al., 2005 for an example). To assess whether there is an inverse relationship applied to individuals, as well as *baris*, we fit multiple logistic regression models (Hosmer and Lemeshow, 1989) after controlling for potentially confounding variables. The models treat the occurrence of cholera in each analyzed individual as the dependent variable, and fit the level of connectivity and potential confounders as independent variables. Coefficients of independent variables in the models were exponentiated to estimate the odds ratio (OR) of cholera associated with different levels of each variable. Standard errors for the coefficients were used to estimate two-tailed P values, and associated 95% confidence intervals (95% CI) for the ORs. Results are shown in Table 1.

The next phase of this study is to assess how spatial distance modifies the effects of social networks and vaccine efficacy. Knowing which baris are connected as well as their spatial locations, we will be able to map the existing social networks in space, and assign each linkage a distance value. We will then weigh relationships by distance and integrate this into our model in order to determine whether or not social distance matters. Additionally, we will change our variables to reflect certain measures, such as the total number of people with cholera an individual is connected to, or the rate of vacinees over the total (rather than target) population. Furthermore, we will continue to work with the demographic and network data to develop different measures of social connectivity, for example looking at in-migration of vaccinated individuals into a *bari* and the relationship this has to cholera occurrence in that *bari*, or creating various networks representing different points in time and integrating this into our cholera incidence data. Finally, we will analyze whether or not the spatial scale or neighborhood size used changes the protective effects of vaccines in one's social network.

Preliminary Results

The results we obtained from a model that integrates the levels of social connectivity an individual has to vaccines are shown in Table 1. Among the vaccine trial target population, there were 49, 336 vaccine recipients and 24, 667 placebo recipients. After controlling for several variables associated with cholera in Matlab, we found that the level of vaccine coverage in the social network of all vaccine recipients was a significant predictor of individual cholera outcome. The effects were stronger for individuals who had received the vaccine than for those who had received the placebo, which differs from the results that took only neighborhood vaccine coverage into account.

	Model 1: All recipients of 2 or more doses (n = 74 003)			**Model 2: Recipients of 2 or more doses of vaccine (n = 49336)**			**Model 3: Recipients of 2 or more doses of placebo (n = 24667)**		
	Odds Ratio	**95% C.I.**	**p**	**Odds Ratio**	**95% C.I.**	**p**	**Odds Ratio**	**95% C.I.**	**p**
Age (years)	0.98	0.97-0.99	<0.0001	0.95	0.92-0.97	<0.0001	0.99	0.98-1.01	0.19
Sex (female vs male)	1.13	0.4-1.54	0.42	1.17	0.77-1.80	0.45	1.05	0.68-1.62	0.83
Religion (Hindu vs non-Hindu)	1.03	0.64-1.63	0.91	1.13	0.59-2.17	0.70	0.96	0.51-1.81	0.91
Distance from *bari* to nearest river (km)	0.90	0.78-1.04	0.15	0.86	0.71-1.04	0.11	0.96	0.79-1.16	0.65
Distance from *bari* to nearest treatment center (km)	1.14	1.06-1.24	0.001	1.14	1.03-1.27	0.01	1.14	1.02-1.28	0.02
Experienced dysentery during follow-up (y/n)	4.45	1.37-14.47	0.01	5.90	1.42-24.53	0.02	3.08	0.41-22.89	0.27
Received 2 or more doses (vaccine vs placebo)	0.45	0.34-0.59	<0.0001	--	--	--	--	--	--
Level of vaccine coverage in social network (%)	0.98	0.97-0.99	<0.0002	0.98	0.97-0.99	0.0077	0.96	0.94-0.98	0.008

Table 1: Predictors of cholera risk in recipients of vaccine or placebo, in three multivariable models

Our results show that the levels of vaccine coverage in an individual's social network matter in terms of conferring protection upon that individual, though the effect was less pronounced in individuals who had received the placebo as opposed to the vaccine. This is in contrast to a previous study which showed higher levels of vaccine coverage in an individual's local neighborhood providing greater levels of protection to placebo recipients than vaccinees. We will continue to explore potential reasons for these results, in addition to integrating geographic data to better understand the spatial nature of these protective networks. These findings have potential implications for informing vaccine trials; specifically, it may assist public health officials in understanding the process of herd immunity based on real-life social interactions.

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Rachel Godwin
UNCC

Title:

Weathering the Tropical Cyclone: Improving public assistance via vulnerability assessment for the older population of New Hanover county, NC.

Abstract Draft 5:

New Hanover County in southeast North Carolina has a high probability of a tropical cyclone landfall along its coast. Some of the hazards from tropical cyclones include inland flooding and damaging winds. Out of New Hanover County's total population, 13.3% of its residents are 65 years or older. This cohort is especially vulnerable to these hazards because of issues relating to infirmity, poverty, and lack of transportation. Public assistance for the elder population is necessary to protect their property and life. Assistance would include the mitigation of the effects of physical hazards and the facilitation of necessary transportation during evacuations. A geographic information system (GIS) is used to conduct vulnerability assessment analysis and visualize the analytical results. Data are from the 2000 Census, 2006 American Community Survey, National Oceanic and Atmospheric Administration (NOAA) Coastal Service Center, and the NOAA National Hurricane Center (NHC). Results from the analysis conclude that the areas that are highly vulnerable to hazards and have dense 65 and older population are most concentrated in the urbanized areas of the county, and therefore, need more public assistance during the threats of tropical cyclones.

Phenological Regions of the Conterminous United States

Jerry Griffith, University of Southern Mississippi; William Hargrove, US Forest Service; Forrest Hoffman, Oak Ridge National Laboratory

ABSTRACT

Multivariate geographic clustering (MGC) has previously been performed on national and global data sets of physical and environmental variables to define and delineate ecological regions. MGC was performed on two MODIS satellite vegetation index data sets that covered the conterminous United States. The data were from MODIS 231 m spatial resolution Normalized Difference Vegetation Index (NDVI) products, and the two different data sets were: 1) cumulative NDVI and 2) phenology. These satellite-derived NDVI data sets from 2002 to 2006 were analyzed at several levels of division, both synoptically for the full 5 years, and for each individual year.

Results showed that the addition of phenological data more clearly revealed information on vegetation characteristics. A quantitative goodness-of-fit method showed moderate fit of the cumulative NDVI and phenology data to existing maps of land cover, vegetation, or ecoregions. However, there was a strong similarity of cumulative NDVI to measures of gross primary productivity ($r = 0.8$). Moreover, analysis of the principal components scores for the phenology data set revealed that these maps represent three main components that successfully differentiated vegetation types and characteristics.

Half

Title: An Analysis of Observed Urban Heat Island in Greenville North Carolina and Its Implication on Energy Consumption and the Environment

1. Objectives

Urban regions are among the most rapidly changing environments on earth. Growing cities impose significant impacts[1], [2] on the climates and environment. Urban Heat Island (UHI) is a well-known phenomenon[3] and its strength is measured by the difference in air temperature between the core of a city and surrounding rural areas. UHI increases energy consumption (air conditioning, refrigeration) [4], [5], air pollution level[6], and heat-related illness and mortality[7], [8], but reduces visibility, water availability and quality. Studies of UHI have been typically on large cities (populations over 100,000). The population of the City of Greenville, NC has been growing rapidly (69%) in the last 18 years (44,972 in 1990, 60,476 in 2000, 76,058 in 2007). The two primary objectives of this study are: (1) to establish quantitative relations between the strength of UHI and synoptic weather conditions, and to examine the seasonality and changes in these relations with future growth of the city; and (2) to establish quantitative relations between UHI and energy consumption, and to develop models for the prediction of energy demand for the city based on weather forecast. Other objectives include the examination of the relations between UHI and water use and air quality.

2. Methods

We built two automated weather stations that meet the standard of the National Weather Service, one of which is located in the core of the City of Greenville and the

other on the West Research Campus (rural area) of East Carolina University (Fig. 1). Measured time series of 5-min averages of air temperature, relative humidity, wind speed and direction, incoming solar radiation, barometric pressure and 5-min total of precipitation are aggregated to hourly averages, which is typical data interval of AWOS/ASOS weather stations. A set of statistical analyses are being performed to quantify the seasonality of UHI and its relations to weather conditions (wind speed, solar radiation). Results included here are partial and only based on data collected from July to September of 2008. These results will be updated in the poster with measurements collected in October and November. We plan to continue this study into the future in order to examine the full seasonality and year-to-year changes. Energy consumption data are being inquired from Greenville Utilities. Findings on the relation between energy consumption and UHI will be added to the poster.

3. Preliminary Findings

(1) the maximum UHI observed in Greenville is 5.4 °C or 9.7 °F, which is comparable to observations in big cities; (2) UHI is stronger at night than during the day (Figs. 2 and 3), in agreement with earlier observations over big cities; (3) at night, UHI increases with decreasing wind speed, but there is no clear dependence of UHI and wind speed during the day (Fig. 2); (3) the seasonality of UHI is such that its strength decreases from July to August and to September (Fig.3). We will examine whether this trend continues into the winter months, which will indicate the relative significance of the influences of solar radiation and energy consumption for heating. Findings on the relationship and energy consumption, water use and UHI will be added to the poster.

Understanding Social Vulnerability of Caribbean Small-Island Developing States

Measuring social vulnerability has proven to be a useful tool for effective public policy, as it identifies populations most in need of assistance before, during, and even after a hazard event. The Social Vulnerability Index (SoVI) (Cutter and Finch, 2008) is the most robust and generalizable index for measuring social vulnerability to natural hazards. However, this methodology has only been tested in the United States. This research will test the applicability of the SoVI methodology for small-island developing states (SIDS) in the Caribbean region. Small-island developing states have been determined to be highly vulnerable regions for various reasons, including, proneness to natural hazards. Additionally, the Caribbean region lies in the heart of hurricane alley, thus making these particular islands especially vulnerable to natural hazards. Moreover, the small scale of the islands allows for application of the Social Vulnerability Index because it was developed for a unit of comparable geographic size-for counties in the United States. It is hypothesized that the SoVI methodology will need to be revised to incorporate component variables more appropriate for the study region.

The proposed poster will present the beginning phase of my dissertation research. It will serve as an outline for my research methods and will present the results of my preliminary analysis. I plan to identify three to four islands that are particularly vulnerable to natural hazards within the Caribbean region based on physical location and socioeconomic indicators. Using the Social Vulnerability Index combined with GIS, I will map the locations of highest vulnerability for one of the identified islands in my study area. This will serve as my pilot study, which will be used to further advance my

dissertation research. My poster will highlight my main ideas, and will detail my pilot study with GIS maps and data tables. In addition, I will summarize my results and propose ways in which these results will advance my dissertation research.

Initiating Campus Recycling Efforts Post Katrina: how a student organization took the lead in developing a recycling initiative at the University of Southern Mississippi

Dr. David Harms Holt
Samuel "Trey" Gill III

The Mississippi Gulf Coast is still in some ways recovering from the devastation left in the wake of Hurricane Katrina. One of the major problems that citizens faced was recycling all of the debris. There was nowhere for the 41 million cubic yards of debris to go but to a landfill. Since then many efforts have been underway to try to be eco-friendly and environmentally conscientious. The University of Southern Mississippi has been attempting to bring recycling back to the Gulf Coast campuses, but the efforts were slowed by logistical issues. Gamma Theta Upsilon (GTU) on the Gulf Coast Campus of the Southern Miss wanted to do their part to help and recycle. With the help of their advisor, Dr. David Holt, they contacted Hattiesburg campus, presented their ideas, and how they wanted/ needed a recycling program. GTU presented issues and offered to place and monitor recycling bins and take the recycling to a recycling center if the University would provide the bins. The College of Science and Technology in Hattiesburg offered to buy eight (8) bins with which to start.

Once GTU received the bins, they were lined with garbage bags and strategically place on the Gulf Park campus in Long Beach, MS and Gulf Coast Student Service Center (GCSSC) in Gulfport, MS in high traffic areas. GTU posted an announcement to the coast's listserv to announce recycling of plastic bottles and aluminum cans and posted signage in the classrooms. The bins are monitored and are checked at least twice a week by a designated GTU member. After a certain amount of material are collected from both locations, GTU meets at a central location to sort the aluminum cans from the plastic bottles. This helps bring awareness to the recycling program. But a bigger issue needed to be addressed.

When talking about recycling, one question that everyone had was where will we take all of this now that we have it? Every member researched the best location to take the recyclables. Locally, due to Hurricane Katrina, facilities are few and far between and most would only receive aluminum and not plastic (the largest volume). One GTU member, Wendy Griffioen, discovered that the Navy Construction Battalion Base (CB Base) was starting up a massive recycling program of their own and they would receive outside materials. As a group, GTU concluded that this would be the best place. We decided that we would separate the plastic bottles from the aluminum and send the aluminum to another recycler as they would pay for the materials. The money is being used to cover the costs of gas to transport the recyclables as well as defray the costs to purchase the bins.

Upon seeing our success, Hattiesburg sent another 12 recycling bins to help out our recycling efforts. We now have more students monitoring the bins and have complete coverage of recycling bins for the GCSSC, Gulf Park, and Gulf Coast Geospatial Center. With this success, we decided to add in paper recycling. Paper adds in a new logistical issue. Plastic is bulky, but paper is heavy. Southern Miss generates a huge volume of paper waste. We announced that we will shuttle paper to the CB Base if the faculty, administrative assistants, and staff will hold their paper recycling until a certain day at a given time and then bring it to a loading zone. We are finding that people really WANT to recycle if given the chance, especially if you make it easy and the process is well known. Now we are loading up a truck full of paper each month and the individual offices are participating in the recycling program. We are generating a recycling community.

There really is no excuse to not recycle. We feel that this method can be emulated at any university. All it takes is the cooperation of the University and people who are willing to decide

that we need to not take everything to a landfill. It takes conscientious people who are dedicated to saving and protecting the environment. Most places are willing to start a recycling program as long as there are those who are willing to step up and lead the way. Here at USM Gulf Park, it is GTU with eco leaders that stood up and said, "let's have a recycling program." We started small, but we feel we have a great recycling program in place after just one and a half semesters. And the most significant part is, we now have the support of our whole campus community and our recycling initiative is a success!

INTEGRATING GIS AND GEOSENSORS TO SUPPORT SUSTAINABLE AGRICULTURE IN A NORTH CAROLINA MOUNTAIN VINEYARD

L.A. Hunter and C.A. Badurek
Appalachian State University
Boone, NC

Precision viticulture has emerged from advances in geographic information technology, including global positioning systems (GPS), geographic information systems (GIS), and geosensor technology. Wireless sensor networks (WSN) constructed from topologically variant geosensor configurations may aid precision viticulture in site-specific crop management by enabling farmers to monitor real-time climate and soil conditions. WSNs provide data for decision-support systems that optimize management treatments based on identification of management zones derived from spatiotemporal analysis of field conditions. Despite the increasing use of geosensor technology, research on practical applications of sensor deployment has been limited.

This thesis examined the use of three precision viticulture techniques, a WSN, soil moisture probes, and soil sampling to optimize management of grapes for high quality grape production. In addition, this thesis addressed one of the most important research issues in the field of geosensor technology: the optimal number of sensors needed for application in practice. Findings from this study may be of use to vineyard managers in determining optimal spatial configurations and costs of wireless sensor networks.

Kar and Hodgson

Is DEM A Better Substitute for Floor Elevation of Residential Structures?

Abstract

Due to rapid growth in population and infrastructure facilities in coastal counties, hurricane induced financial damage in the U.S. is increasing substantially. It was pointed out in a study by Changnon *et al.* (2000) that the annual financial loss from hurricanes in the U.S. has increased from $5 billion in the 1940s (standardized for inflation to 1990 dollars) to $40 billion in the 1990s. Hurricane Andrew of 1992 and hurricane Katrina of 2005, which contributed to about $25 billion and $200 billion damage respectively are examples of the increase in financial loss. To mitigate financial loss from future hurricane events, especially to residential structures, loss estimation models have been developed by insurance industries. Most of these models are proprietary in nature. The critical criterion of such models is to know where a building is and the base floor elevation of the building. Building footprint data are seldom available. In fact, the best available data is typically just the location of parcel boundaries. Therefore, these models are not useful for large regional studies.

While modeling the location of a structure, it could be assumed that the building is located at the highest elevation of the parcel. For waterfront properties this makes logical sense as each structure is required to be elevated above Base Flood Elevation determined for certain flood zones. Even before the FEMA floodplain program and local zoning, prudent construction would position the structure away from the waterline. For older structures, however, there is a chance the structure is at lowest elevation of the parcel.

To estimate loss at the parcel scale of analysis, determining elevation at which the structure is located is critical. Due to lack of information about building location in a parcel, the *maximum elevation* extracted within a parcel could be substituted as the *floor elevation* of the structure located in the parcel to estimate loss. Obviously, at census scales, there is a complete lack of information about the location of structures within residential parcels of a census unit. Thus, there is a need to estimate *elevation* within a census unit that is a 'good' representation of the *floor elevation* of all the parcels present in the census unit; this proxy could be used for loss estimation at census scales. The following research questions were explored in a Miami-Dade county to determine the best *elevation* to use as a substitute for *floor elevation.*

1. *Which elevation statistic (e.g. average parcel elevation, parcel centroid elevation) in a parcel best represents the actual elevation of residential structures?*
2. *Which elevation statistic best represents the actual building location at census scales (e.g. block, block group, tract, county)?*
3. *What is the error distribution of the different elevation statistics estimated at different census scales?*
4. *Does the spatial resolution of DEM (e.g. 10m, 30m) influence the elevation statistics – foundation elevation relationship?*

The horizontal location (X-Y) of a structure within the parcel could also, in theory, influence whether the structure would be flooded in a storm surge. However, the storm surge depth does not vary across the size of residential parcels. The process scale for the hurricane-induced storm surge is much different than parcel-scale observations. Thus, only elevation of the structure is important for this scale of observation and was the only characteristic empirically evaluated in the pilot study.

In addition to the residential parcel boundaries for Miami-Dade County, the building footprint centroid data (center of each residential structure location) obtained from the County

Tax Accessor's office for the year 2005 was used to answer the research questions above. By spatially joining the building footprint centroid layer to the single-family residential parcel layer, building footprint(s) within a parcel was extracted. For the total single-family residential parcels, there was only one footprint present in 96.8% (299,023) of the parcels. More than one footprint was present for a few of the parcels (1,821 or 0.59%); which could be due to the presence of external pet shelters, tool sheds or other quarters. About 2.5% (7,786) of the total parcels did not contain any footprints. For the pilot analysis, only the parcels containing one footprint (299,023) were used.

Using the DEM layer as value grid and parcel layer as zone grid, zonal statistics was used to extract the maximum, minimum and average *elevation* within each parcel. Likewise, the *elevation* at the building footprint centroid and parcel centroid were extracted.

The *elevation* at the building footprint centroid (i.e. the reference data) was compared with the *elevation* statistic (i.e. maximum, minimum and average) assessed within a residential parcel and for the parcel centroid. The maximum, minimum and average *elevation* within a census unit were also compared with the maximum, minimum and average of the maximum, minimum and average *elevation* of all parcels, parcel centroids, and building footprint centroids present in the specific census unit. To determine the most accurate *FE* statistic to represent modeled building elevations, the root mean square error (RMSE) and paired t-tests were computed. Equations 1 and 2 represent the formulas used to estimate RMSE at the parcel level and census scales.

$$E = \sqrt{\left(\frac{\sum_{i=1}^{n}(BCE - PE)^2}{n}\right)} \quad (1)$$

Where E = root mean square error, BCE = elevation at building foot print centroid, PE = minimum/maximum/average elevation within a parcel or elevation at parcel centroid, n = number of parcels in the study.

$$E' = \sqrt{\left(\frac{\sum_{i=j}^{m}(CE_j - PE')^2}{m}\right)} \quad (2)$$

Where E' = root mean square error, CE_j = minimum/maximum/average elevation of a census unit, PE' = minimum/maximum/average of minimum/maximum/average elevation of all the parcels or elevation of all the parcel centroids present in the census unit, m = total number of census units (i.e. blocks, block groups, tracts).

The Root Mean Square Error (RMSE) estimated at the parcel level using 10 and 30 meters resolution DEM indicated that *elevation* computed at parcel centroid and the average elevation within a parcel are close to that computed at building centroid. At all the census scales and in both 10 and 30 meters resolutions, the *average elevation* of a census unit is the best estimation of the *floor elevation* as it produced the least error when compared to the average elevation of parcel centroids. The RMSE values for all average elevations were consistently less than 32cm.

It was clear that the average elevation of a census unit is a very good representation of the actual building location within the census unit, and parcel centroid is a very good representation of actual *floor elevation* of structures. It was also clear that the least RMSE was produced when a 10-m DEM was used to extract elevation at all the scales of analysis. It is safe to conclude that the spatial resolution of DEM does influence the elevation statistics and *floor elevation* computation.

Keywords: *scale of analysis, elevation, statistics*

Dustin Kimbrow

Channel Migration on the Choctawhatchee River, Southeastern Alabama, 1961 - 2006

Cutoffs and oxbow lakes are common occurrences within slowly meandering alluvial streams. River cutoffs may occur for various reasons. Past research has shown that gradual bank erosion, flood events, and meander sinuosity reaching a critical state may all be contributing factors related to cutoff formation. This research mapped the changes that have occurred on a 25 mile reach of the Choctawhatchee River in southeastern Alabama during the 45 year period from 1961 to 2006. Historic aerial photographs from 1961, 1999, and 2006 were used to document the channel migration on the Choctawhatchee River. This study also discusses the probable causes of change in this stream's evolution. Results from this research indicate that four major changes in channel form have occurred from 1961 to 2006. Results also indicate that the causes of change vary with each cutoff. Gradual bank erosion, flooding and bankfull discharge frequency, meander sinuosity reaching a critical state, density of riparian vegetation, and floodplain composition may all be factors in cutoff formation.

Abstract

Monitoring the effects of land use change on soil carbon and nitrogen in the Charlotte Metropolitan area

S. Lamsal, A. Davis, M. Dorning, D. Shoemaker, R. Meentemeyer

Soils provide numerous ecosystem services that are of environmental value. Human activities leading to land use change has the most direct and substantial effect on soil ecosystem services; as such there is a need to monitor the effects of land use change on soil ecosystem services. The overall objective of this research is to establish long term environmental monitoring network to assess the effects of land use change/urbanization on soil C and N in the Charlotte Metropolitan area. Selection of monitoring plots (N: 100) will follow a stratified (strata – land use, topographic moisture index, solar illumination) random; soil samples will be collected at 0-10 cm and 10-30 cm from a soil profile within a plot, and selected plots (N: 25) will be sampled densely (four profiles per plot), thereby creating a nested sampling design. The samples will be analyzed for a suite of soil properties including moisture content, bulk density, pH, total carbon, total nitrogen, organic matter, etc. Data analysis and up-scaling will embrace a combination of statistical, geostatistical and hybrid methods. The effects of land use and land-use change gradients on soil properties will be assessed using paired approach, mixed effects analysis of variation, and autocorrelations in space and time. We will upscale plot level data to landscape scale using auxiliary soil-landscape variables derived from land use data, digital elevation models, soil surveys, and remotely sensed imagery, and map soil C and N storage. We will combine results with land use change models to forecast the anticipated changes in soil C and N storage over time. These results will be useful to develop environment-friendly land use development plan for the region, and also be relevant for other areas undergoing similar land use changes.

McGraw and Watkins

Introduction

The link between reach level in-channel sediment storage features, such as channel bedforms, and changes in sediment supply is a topic of interest within the discipline of fluvial geomorphology. The association of reach types and ratios of transport capacity to sediment supply combined with identification of external influences provide a conceptual framework within which to investigate channel processes and examine spatially distributed responses to watershed disturbance (Montgomery and Buffington 1997). A major factor influencing the amount and type of sediment supplied to river channels is land use (Goode and Wohl 2007). This research examines associations between different land use types and the occurrence of different reach-level channel bedforms.

We hypothesize that the dominant land use helps to determine the type of channel bedforms that occur in a given reach by controlling the magnitude of storm runoff. Specifically, we hypothesize that channels located in urban watersheds experience more homogeneity of channel bedforms than channels located in rural watersheds.

Methods

We chose four streams in urban watersheds and fours streams in forested watersheds and measured and compared the percent surface area occupied by different types of bedforms. Streams segments were selected based on accessibility to the channel with a maximum of 15 meters between banks. We chose streams with relatively shallow depths in order identify bedforms with certainty. We selected a 100 meter study reach with the tape

placed along the thalweg of the stream. Bedform type, width, bank cohesiveness, bank stability, and bed material were observed and recorded at two meter intervals. We classified bedforms into different types based on the types of bedforms that can occur in river channels described by Montgomery and Buffington (1997). We calculated area for each bedform by multiplying the length of each bedform by the average width measurement and percent area for each bed form was based on total stream areas.

Results

Plane bed bedforms make up the largest percent area of bedforms found in both urban and forested streams, suggesting a transition between supply- and transport- limited morphologies.

Conclusions

The results are the opposite of what we hypothesized. Channels located in urban streams showed more heterogeneity in channel bedform type than channels located in forested streams (Figure 1). Upon closer examination of the urban watershed channels and their locations, we noticed that two of the streams flowed through residential areas and as a consequence, contained large areas of forested land. This suggests that the intensity of land use and not just the type of land use plays a role in determining the types of bedforms present.

Dr. Charles Roberts
Erika Milani
Department of Geosciences
Florida Atlantic University
Boca Raton, Florida

Poster Abstract for SEDAAG 2008

Mapping Greenspace – Impervious Area at the Lot Level using Digital Image Analysis Procedures

This poster will demonstrate the feasibility of producing a report for each lot that documents the area of greenspace, the exact square footage that needs to be watered and fertilized, and the lots contribution to run off.

Utilizing a simple digital image analysis procedure, we are able to classify the urban lots into two categories, greenspace and runoff, calculate the area of each category and the percent of land cover that falls into each category.

This information would be useful to homeowners. They will be able to know how much fertilizer would be needed for their lawn. This information will also be useful to storm water managers. They will gain the knowledge of how much runoff, in square feet, comes from runoff from each individual lot as well as all total lots.

The images below represent the study area which is the city of West Palm Beach, Florida as a raw images as well as a supervised parallelpiped classification into two-categories: greenspace and impervious image.

Next, in order to accurately assess the classification between the two categories of greenspace and impervious a 211 stratified random point sample was conducted. A classification accuracy report was produced as can be seen in the table below.

Classes	Errors of Omission	Errors of Commission	Producers Accuracy % Correct	Users Accuracy
Class 1 Impervious	33/134= 25%	11/112= 10%	101/134= 75%	101/112= 90%
Class 2 Greenspace	11/77= 14%	33/99= 33%	66/77= 86%	66/99= 67%
Overall	44/211= 21%	44/211= 21%	167/211= 79%	167/211= 79%

Other images will include an analysis of structure of the errors. Images with such errors as tree canopy falsely classified as impervious, grass incorrectly classified as impervious due to shadow effects, sidewalks and roads misclassified as greenspace, light colored rooftops mistakenly classified as greenspace, and automobiles also wrongly classified as greenspace.

Lastly, images for the city of West Palm Beach, Florida parcel and building data at the lot level with greenspace and impervious area will be shown. Steps taken as to how the exact square footage was calculated for the area of greenspace and the area of impervious at the lot level will also be included.

4Chan.org: Mapping a Subversive Virtual Place, Stephen Garrett Nelson, East Carolina University

For the past several years, geographers have examined the construction and contestation of social life and community in cyberspace. Web pages and sites are increasingly analyzed as discursive spaces in which people and institutions give "voice" to their interests and worldviews, some of which diverge from and challenge dominant social and political narratives. In some instances, the Internet is a place for openly destabilizing and subverting established ways of thinking. One of the most provocative and interesting examples of this online subversion is the web site 4chan. Images and text on 4chan are produced by users who are largely anonymous. There is little regulation of the web site's messages either externally or internally. The 4chan site represents a liminal space in which users are free to express themselves in multiple and often controversial ways. Through the creation and recreation of sometimes nonsensical text and visual images, a community of users engage in "culture jamming," where the conventional and often unquestioned meanings of images, ideas, and identities are appropriated and subverted. These recreated images form a bond of shared knowledge between users based on resistance and having a voice. This group resistance helps create a strong sense of place. This sense of place is then transferred to a real world environment, where demonstrations against certain organizations deemed harmful to "4channers" take place.

Applying the Karst Disturbance Index in West-Central, Florida and Southeast, Italy

Leslie A. North[1], Philip E. van Beynen[1], Mario Parise[2]

[1]University of South Florida, Department of Geography
4202 E. Fowler Ave.
Tampa, FL 33620

[2]National Research Council
Piazzale Aldo Moro,7 - 00185, Roma, Italia
Geology and Geography Session

Abstract

A hierarchical and standardized environmental disturbance index, specifically designed for karst landscapes, was created by van Beynen and Townsend (2005). The karst disturbance index consists of 30 indicators contained within the five broad categories: geomorphology, hydrology, atmosphere, biota, and cultural. The purpose of this research is to apply the KDI to two distinct karst areas, West Florida, and Apulia, Italy. Through its application, the utility of the index can be validated, recommendations for its refinement can proposed, and important comparisons between the regions can be made, such as differences in the karst legislations implemented in each region and the effect of length of human occupation and population density to karst terrains. Italian karst is more diverse than the karst found in west-central Florida, aiding in the evaluation of the applicability of each KDI indicator through the application of the index in distinctly different karst terrains. Overall, major impacts for southeast Italy include quarrying, stone clearing, and the dumping of refuse into caves, while west-central Florida karst suffers most from the infilling of sinkholes, soil compaction, changes in the water table, and vegetation removal. Minor issues arising during the testing included the need for broader

indicator descriptions, a new water quality indicator, obsolete data on sinkholes, and a lack of data for biota indicators.

Keywords: Florida, Italy, karst, index-environmental, urbanization, human impact

NAME: Stephen O'Connell
AFFLIATION: University of Mary Washington
TITLE: Visiting the Sea of Sapphire: A History of Access and Amenity on the Road to Crater Lake

ABSTRACT:
This poster presentation showcases the changes in travel landscapes along the major approach roads to Crater Lake National Park in southern Oregon. The primary focus is on the type, location, and evolution of services as well as the quality of transportation infrastructure. These factors directly impact both the visitation to the park and the expectations of visitors once there. Changes in the availability of services or of infrastructure quality have the potential to change the use patterns for the park. The broader research examines the roles of community groups in the initiation or restriction of new developments and how local dynamics can affect the landscape along park access corridors.

KEYWORDS: cultural landscape, national parks, rural development

Seasonal Variability in Beach Profile at a Caribbean Location: Puerto Rico

Naomy Pérez-Sanchez

East Carolina University

Little has been studied about Caribbean beach profiling in general. Puerto Rico is a key site to study beach variability because of the differences in wave and wind environments (i.e. Atlantic Ocean vs. Caribbean Sea), its central location within active tectonic margins, its irregular island shelf, and its limited sediment budget. Past studies (Barreto, 1997) have shown a particular behavior in Puerto Rican beaches. They does not necessarily follow general beach behavior. This poster has 2 main purposes: (1) to show how changes in season dictate changes in a beach profile, and (2) to update Puerto Rican beach behavior knowledge.

Robyn Polinsky
Georgia State University
Abstract for poster presentation

Utilizing Green Roofs as Tools for Storm Water Management in an Urban Metropolis

Storm water management is an essential aspect of urban hydrology as it relates to water quality and quantity. Urbanized areas are characterized as having large amounts of impervious surfaces and well developed sewer and drainage networks which rapidly channel water off of streets and into local streams (Sauer et al. 1983; Paul and Meyer, 2001; Nelson, et al. 2006). Watersheds with as little as 10-20 percent impervious cover can result in substantial stream ecological degradation (Bledsoe and Watson, 2001; Booth, et al. 2004). Impervious surface cover effectively reduces groundwater infiltration rates and storage levels, which over time impairs useable water quantity and quality. As storm water is quickly carried from roads to streams in the form of runoff, a greater amount of surface pollutants are introduced into the stream because the water is unable to undergo the natural filtration process through the soil (Farahmand, et al. 2007). This rapid introduction of storm water to a receiving stream leads to intensified local flooding. In addition, local groundwater supplies are reduced as the water is carried downstream and out of the basin instead of infiltrating and replenishing the local water table (Yin, 1993; Rose and Peters, 2000). Stream channels and the biotic life they support are highly sensitive to urbanization. Channels often undergo rapid erosion and incision which leads to a widening and deepening of the channel and often times leads to a decline in biological health and diversity (Bledsoe and Watson, 2001; Booth, et al. 2002; Watson, et al. 2002; Booth, et al. 2004).

A variety of policy tools have been implemented to alleviate the impact impervious surfaces have on urban watersheds. One strategy has been to place a limit on the total amount of impervious area in a given watershed. For example, the Georgia Planning Act of 1989 limited impervious area in small watersheds to 25%, or existing use, whichever is greater (Carter and Jackson, 2006). Limiting impervious surfaces, however, can be highly problematic and politically unfeasible due to conflicting economic interests because land is extremely valuable from a developer's standpoint

(Carter and Jackson, 2006). In addition, existing land use in urban centers often exceeds the 25% threshold. An alternative approach to limiting impervious areas is to encourage storm water managers to alleviate the environmental impact of storm water from impervious surfaces through the use of storm water best management practices (BMPs) (Carter and Jackson, 2006). BMPs use low impact development techniques to reduce storm water impacts on receiving streams by increasing storm water storage areas across a watershed, slowing the flow of water into the receiving water body, and/or replacing impervious surfaces with pervious areas that allow for infiltration (Carter and Jackson, 2006). Because land availability is limited in highly urbanized areas, there is an increasing need for land uses that serve multiple purposes. One feasible method for reducing storm water runoff is through the use of vegetated (green) roofs, which efficiently detain and retain storm water when compared to conventional (black or concrete) roofs (Carter and Rasmussen, 2006). Studies have shown that retrofitting existing buildings with a green roof can significantly reduce and in some cases eliminate the storm water contribution from the existing structure (Carter and Rasmussen, 2006). In highly urbanized areas, green roofs have the potential to be extremely beneficial at reducing peak discharges, increasing the lag time between peak rainfall and peak discharge, and extending the duration of response in a receiving stream or water body. All of these benefits help to reduce stream power and erosion as well as help to reduce flood frequencies and magnitudes and improve the overall health of the stream.

A Multi-proxy Approach to Using Cave Sediment Carbon Isotopes for Late Holocene Paleoenvironmental Reconstruction in Florida

By: Jason Polk

Cave sediments collected from Jennings Cave in Marion County, Florida were analyzed using a multi-proxy approach. Fulvic acids (FAs), humic acids (HAs), bulk organic matter, and phytoliths were extracted from the sediments for carbon isotope analysis to determine periods of vegetation change caused by climatic influences during the Late Holocene (~ 3,000 years BP). Magnetic susceptibility and density analyses were also performed to compare physical sedimentary characteristics related to precipitation to the carbon isotopes. The carbon isotope record ranges from -35‰ to -14‰, exhibiting variability of ~21‰, within the different proxies, which indicates changes between C_3 and C_4 vegetation. Density analysis closes matches the FAs, indicating changes in the sediments during shifts in the vegetation regime. This likely indicates changes between a sub-tropical forested environment and more arid, grassy plains conditions.

These changes in plant assemblages were in response to changes in available water resources, with increased temperatures and evapotranspiration leading to arid conditions and a shift toward less C_3 vegetation (increased C_4 vegetation) during the MWP. The cave sediment fulvic acid carbon isotope record agrees well with $\delta^{13}C$ values from a speleothem collected nearby that covers the same time period. Prolonged migration of the NAO and ITCZ affects precipitation in Florida and likely caused vegetation changes during these climatic shifts.

Abstract: The Mexican migrant population of Northeast Mississippi. Anna Pounders Department of Geosciences, Mississippi State University and John C. Rodgers III, Department of Geosciences, Mississippi State University. Migrant Mexican workers have been recently flocking to the Southeast, yet very little is known about this new population. This is especially true for rural northeast Mississippi where very few studies have investigated Mexican migrant communities. To alleviate this dearth of knowledge, an IRB-approved survey of Mexican migrants was conducted in the Spanish language within Itawamba and Tishomingo Counties, northeast Mississippi. During the summer of 2006, ninety nine participants were recruited using the "snowball" interview method. Once participants agreed to the survey and signed a consent form in Spanish, they were asked questions regarding date of birth, source region, residency time, and type of employment. The majority of participants were males aged 18 to 24; 50% of all participants worked in manufacturing and 17% worked in construction. More interestingly, 60% of participants were from Atlantic Mexican states. No participants were from Mexican states that border the US. Notably 64% of participants migrated directly to the study region. The average residency time in the study area was 3.98 years. The proportion of migrants from non-traditional source regions, the short residency time, and the similarity in job type illustrate the importance of family networking in drawing migrant workers to rural Southern communities.

COOPERATIVE ACTIVITIES AT THE NOAA SOUTHEAST REGIONAL CLIMATE CENTER

Peter Robinson, Charles Konrad III, Christopher Fuhrman, Gretchen Carlson
NOAA Southeast Regional Climate Center
Department of Geography
University of North Carolina at Chapel Hill

The NOAA Southeast Regional Climate Center is developing a Clearinghouse for the active storage and dissemination of data and information about climate, climate change and climate impacts. A major function is to foster the identification of emerging societal issues where climate information can contribute to solutions and, conversely, where new climatological knowledge can assist in solving existing problems. Initial development will focus on links between climate and public health. The Regional Center will host the necessary web-based archives and provide a portal for other information. When operational, cooperating professionals will be able to interact with this knowledge base, to pursue pertinent activities ranging from climatic research through policy analysis. A strategy to provide an orderly development is under way and will be discussed in the poster. There are opportunities for interested individuals and groups to participate in this development stage as well as in the completed Clearinghouse.

Finding meaning in cultural landscapes through viewshed analyses

L. Jesse Rouse, PhD Candidate
Department of Geology and Geography, West Virginia University

Spatial analysis, one of the key components of Geographic Information Systems, is generally seen as quantitatively driven, and deeply rooted in the positivist ideas of spatial science. The apparent disconnect between the quantitative processes being studied and their impact on, or cause by, culture has often been at the core of the critique of the use of GIS within the humanities and humanistic scholarship. As sessions at recent conferences focusing on the interplay between GIS and the Humanities have shown, however, there is a great deal of potential in considering the spatial aspects of research in humanities disciplines. As with any method or technique, the use of GIS is driven by the user and how they choose to utilize the tools at hand.

Submerging History: Mapping Archaeological Sites Affected by the Three Gorges Dam Reservoir

Rosemary M. Rowe

The Three Gorges Dam, located in the central Hubei Province in China, is considered the mother of all dam structures around the world. The dam, which is over a mile long and approximately 600 feet high, was built across the Yangtze River to provide affordable electricity to the masses, manage flooding, and to allow large cargo ships to sail up from Shanghai to Chongqing.[1] Controversy has surrounded the project since it started in 1993. Environmental consequences, pollution, stability of the dam, and the displacement of approximately 1.4 million people are a few of the many concerns surrounding the project.[2] Although these are all important issues, the main focuses of this study will be on the historical significance of the area and the locations of several archaeological sites that will forever be lost under the waters of the Three Gorges Reservoir.

Approximately 1,300 archaeological sites will be affected by the reservoir. Teams of archaeologists from across China have been in a race against time since the beginning of the project in 1993. Several ancient tombs, villages, weapons, pottery, and several other antiquities have been discovered since excavations began and surprising discoveries have been made on the ancient cultures that once populated the area thousands of years ago. Relics and remains concerning (but not limited to) the mysterious Ba culture as well as Paleolithic and Neolithic peoples are some of the discoveries that archaeologists have made since the start of the Three Gorges Dam.[3] Many ancient villages and towns, containing important historical monuments and structures will also be affected. Chinese archaeologists are working day and night to remove

these important items from the area and place them into museums. They are also working to relocate some important temples, which would otherwise be submerged by the rising waters. Towns and villages that have been around for well over a thousand years will be or have been demolished for the reservoir. Some of the archaeologists and villagers were able to dismantle private homes (that were built by ancestors) and rebuild them in new villages.[4] Even though the Chinese archaeologists are working hard to preserve their cultural relics and monuments, there is no way for them to finish before the reservoir is completely filled in 2009. A few battles that Chinese archaeologists have to face besides limited time and a full workload is under-funding from the Chinese government and looters that have been tearing through the archaeological sites since the project started.

The focus of the study is to create a map of the Three Gorges Dam's completed reservoir. Mapping and documenting the archaeological sites and historical villages throughout the area to be submerged will not only show the massive cultural loss of the Chinese people, but it will also show the scope of the mega-project that Chinese archaeologists have had to face since 1994. This area is of great cultural value, but the demands of "progress" are going to wash them away.

Extreme rainfall and Madden-Julian Oscillation over Malaysia

Ahmed Salahuddin and Scott Curtis
Atmospheric Science Laboratory
Department of Geography
East Carolina University
Greenville, NC 27858

ABSTRACT

The paper investigates a connection between extreme rainfall variability and the Madden-Julian Oscillation over Malaysia from the period of November to January of 1998 to 2007. A total of 23 rain gauge stations are being considered for this study. The 99th percentile of extreme precipitation of annual cycle of mean rainfall suggests that coastal stations are heavily influenced by the climate of equatorial South China Sea. The examination of the relationship between daily precipitation amounts and the MJO activity for Kuala Terengganu Airport (KTA) (on the east coast of peninsular Malaysia) station suggest that the correlation is very low which may be due to the scattering of light rain values. Low rainfall amounts less than 30 mm occur between the positive and negative phases of real-time multivariate MJO index (RMM2). However, RMM2 shifted towards negative values as rainfall rates increase. The highest peak of the rainfall is seen in December. Again, this is just for a particular station at the 99th percentile value. Therefore, the lower-percentile (75th) value along with mean and standard deviations for remaining 22 stations are being computed and mapped in order to confirm the relationship between extreme events and the MJO over Malaysia.

Abstract
Mexican communities that share common property, or *ejidos*, of the Calakmul municipality located in southern Yucatan peninsula are gradually experiencing the effects of climate variability. Increasing temperatures, an overall decline in rainfall, year-to-year variability in rainfall patterns, and out-of-season hurricanes are some of the problems cited as challenges to human and animal populations. It is with this backdrop that Calakmul farmers (*campesinsos*) practice rain-fed commercial and subsistence agriculture and rear livestock, while increasingly produce charcoal. Our exploratory research noted the perspectives of key informants from different villages spread throughout the municipality, as well as authorities, in assessing the effects of climate variations on productive systems and livelihood strategies. With special attention to charcoal production, this portion of our research investigates livelihood alterations in response to the climate variability using surveys and interviews. Additional attention is paid to the impact on conservation regimes in and around the Calakmul Biosphere Reserve as they relate to possible deforestation.

The Cry Wolf Index:
Perceived Landfall Distance vs Actual Landfall Distance for Gustav Evacuees

Jason C. Senkbeil and David M. Brommer
Department of Geography
University of Alabama

Major hurricane evacuations in the United States frequently result in chaotic traffic jams and disgruntled residents. Personal evacuation decisions are made between 120 and 24 hours prior to landfall and the bulk of the population floods the highway network in the same 18 hour window within this period. People choose to evacuate in this 120 – 24 hour window with a specific mental picture of where the storm is going to make landfall based on predictions by the National Hurricane Center, local television, or the Weather Channel (these sources are all essentially the same). Storm tracks commonly shift from 50 – 200 kilometers in the 72 hours prior to landfall and many evacuees may not pay attention to these details once they are on the road. A slight shift in track makes a huge difference. As results will indicate, people generally believe the storm is headed somewhere near their home and this causes a major discrepancy between expected damage and actual damage. This damage difference has been commonly alluded to in various forms of print and media as a "Cry Wolf" effect (Dow and Cutter 1998). It is the intent of this phase of our research to quantify this "Cry Wolf" effect by using survey data gathered in person during the evacuation of Hurricane Gustav. Like many previous storms, Gustav prompted a mass evacuation of the Louisiana Gulf Coast, thus providing an ideal and narrow window to survey evacuees during the evacuation process. Many researchers have conducted post storm surveys, but it is believed that no previous study has conducted surveys in person during the evacuation process.

This poster (combined with the adjacent poster) represents one aspect of our broad research theme on the influence of meteorological hurricane variables on personal evacuation decisions. Specifically for this poster, we created a "Cry Wolf" index as expressed by a Z score measuring perceived vs actual landfall distance. Data was obtained through personal surveys at two interstate rest stops 42 and 24 hours prior to landfall. Among many other questions, individuals were asked to provide their home zip code, the city where they anticipate the eye of the hurricane will make landfall, and the exact time and day they made their evacuation decision. We collected 275 completed surveys from over 70 zip codes in the evacuation region, and therefore summarized the results by 3 digit zip code regions. For statistical purposes we randomly selected 30 surveys from each 3 digit zip code region containing a sufficient sample size. Our regions included the most adjacent coastal zones of 700/701 greater New Orleans, 703 Houma/Thibodaux, and 705 Lafayette.

Results indicate a general personal landfall bias towards a location close to each survey participant's residence. The greater New Orleans area (700) displayed the highest CWI score at 3.32. The mean perceived landfall distance for a resident of this region was 59 kilometers west while the mean actual landfall distance was 95 kilometers west; however, it must be noted that this region had the earliest mean evacuation time at 63 hours prior to landfall. Houma/Thibodaux (703) received the brunt of Gustav and thus their CWI score was much lower at 0.9. This region had a late mean evacuation time of 45 hours. The mean perceived landfall distance for a resident of this region was 6 kilometers east and the mean actual distance was 19.5 kilometers west. The Lafayette region (705) displayed a westward bias towards personal location with a CWI score of -1.4. The mean perceived landfall distance for a resident of this region was 81 kilometers east while the mean actual landfall distance was 106 kilometers east. The mean evacuation time for the Lafayette region was 54 hours.

These results (combined with the adjacent poster) contain valuable information regarding hurricane evacuation decision making on the personal level. We feel that the data collected during the evacuation of Gustav is of great utility compared to previous research due to the unique time window while these decisions were still fresh on the minds of evacuees. Further research will attempt to establish CWI scores in other coastal regions to see if these values are unique to Louisiana.

Cindy M. Shaw
Dr. Charles Roberts
Florida Atlantic University

Mapping Automobile Space through Digital Image Analysis of DOQQs of Pompano Beach, Florida

ABSTRACT FOR POSTER

In a 1974 article in the Geographic review, Ronald Horvath documented a methodology for mapping the proportion of urban areas devoted to the automobile. The technique was rarely or never utilized because of the labor-intensive methods for gathering field data and drafting maps with pen and ink. This project demonstrates the feasibility, comparatively low cost and accuracy of producing maps of automobile-dominated space in the urban context from digital orthophotos, utilizing digital image analysis procedures in a GIS environment. The resulting data layer consists of a raster map of Pompano Beach, Florida classified as either machine (automobile) space or human space.

The initial image used for processing is a 1999 color infrared DOQQ of Pompano Beach, quad 1801. This was imported into ERDAS Imagine and subset to encompass approximately 2 square miles of the northern part of the quad. The image was degraded by a factor of 2, so that further processing might eliminate sidewalks and footpaths.

Normalized Difference Vegetation Index (NDVI) was applied to the image, which was then density-sliced into two categories; vegetation and "other". Up to this point, "other" includes water, roads, buildings, soil, and anything which has a low reflectance in the infrared band.

The resulting image was imported into Adobe Photoshop. With the assistance of Virtual Earth, ground truthing methods were used to remove all buildings and features which are not devoted to the automobile, leaving roadways, driveways, parking lots and commercial entities which provide auto services. Pompano Air Park, which in this case is considered to be air space, was assigned its own polygon in a third color.

The Pompano Beach subset was then imported into ArcMap, and rectified to the Broward County road shapefile, in order to restore road areas lost to shadow. The Broward County water shapefile was also applied, and assigned a fourth color.

When this final image was reopened in PhotoShop, there were now 4 colors representing air space, water space, people space and road space. The accompanying histogram displayed four spikes representing these four categories, how many rasters in each category, and total rasters. These numbers were then used to calculate total automobile space: water and air space rasters were subtracted from the total, leaving people and automobile space, from which a percentage could then be derived.

The low cost and time required for deriving this type of data demonstrates the relative ease of facilitation to town planners, environmental entities and new urbanists in evaluating future plans for sustainable development of urban areas.

Using GIS t
Will Spence
Georgia Southern University

Since 1972, the Southern Pine Beetle has destroyed over $246 million of pine timber in Georgia. From 2001-2002 alone $71 million worth of timber was destroyed. Factors leading to infestation: drought (extended), overstocked stands, longleaf or slash pine stands, general tree stress, lack of natural predators (woodpeckers, clerid beetles), areas of previous infestation. Using ArcGIS I created 3 maps based on drought, previous areas of infestation, and acres of host tree species by county in Georgia. I then overlaid these three layers and queried areas with high drought and high recurrences of SPB. Risk was determined based on drought and previous infestation areas. Areas with extreme drought and over 13 years of documented outbreaks were considered to have the highest risk. Drought was emphasized more than areas of previous outbreaks when determining predictions because while previous infestation areas are key, they may no longer be active areas while drought areas have a greater likelihood of infestation. This map is not intended to predict actual SPB infestation locations, but counties that are at greatest risk of outbreak based on preferred SPB environments.

The Disappearing Act: Quantifying Thermokarst Change in the Campsite Lake Watershed, Alaska

Purpose and Literature:

The Arctic is the most susceptible environment to the effects of global warming, irrelevant of whether they are anthropological or natural in cause. This is due in part to the positive feedbacks present in the Arctic, which may exacerbate the effects of climate change (Overpeck et al., 1997). Thermokarst activity occurs due to the thawing and collapse of permafrost and illustrates the effects of increased atmospheric temperatures in the Arctic (Murton, 1996). These collapses of permafrost can manifest themselves as pits, depressions, or appendages on lakes that may be filled with water (Serreze et al., 2000). The observed increase in permafrost temperature in the Arctic over the last half century has already begun to increase the incidence of thermokarst (Osterkamp, 2005, Romanovsky et al., 2007). Over a fifty year period from 1950-2000, Stow et al. (2004) have found a decrease in the area of lakes due to thermokarst activity in Alaska. Over a similar period of time, a 76 percent increase in total thermokarst area in Quebec was noted, with every thermokarst pond in the study area experiencing an increase in area (Vallee and Payette, 2007). This activity could potentially completely destroy ecosystems, especially those ecosystems whose stability depends on permafrost, and convert them to other types of currently undocumented ecosystems. It could also increase methane amounts by increasing areas of ponds and wetlands (Serreze et al., 2000).

Research Design:

Using a 1982 color infrared aerial image, a 2005 pan-sharpened satellite Probatoire d'Observation de la Terre (SPOT) image, and a 2007 Landsat 7 ETM + (Figure 1), this research has looked at the incidence of thermokarst additions to Campsite Lake watershed located

southeast of the Toolik Lake Research Station and north of the Brooks Range. The 1982 image and 2007 Landast were rectified to the SPOT image to ensure that the same projection was used in all of the images. Each image was clipped to the size of the watershed. The clouds and shadows in the SPOT image were removed from the image, and the cloud that was over the lake was recoded as water, with certainty. The images underwent an unsupervised classification to differentiate between water and different land types, and a cross-tabulation matrix was created to locate the areas and amount of area that converted into water. Both the area and perimeter of Campsite Lake were measured from the imagery to additionally quantify the karst activity (Figure 2). Although each image has a different spatial resolution, one can obtain an estimate of the perimeter and area at each time.

Findings:

Campsite Lake has had a rich history of thermokarst. The areas in the yellow boxes in Figure 3 indicate areas where thermokarst has added to the existing area of Campsite Lake. There has been a 5.53-hectare increase in water in the watershed, which accounts for 1.13 percent of the total landscape of the watershed (Figure 4 and Table 1). Some of this increase in water may be due to the difference in the spatial resolution of the images. Campsite Lake had a 2.9 percent (2.20 hectares) increase in its total area between 1982 and 2005 and a 10.8 percent increase (293.14 meters) in its perimeter (Figure 5 and 6).

After field inspection of Campsite Lake and inspection of the 2007 Landsat image, it was noted that the thermokarst activity that was present on the southern portion of the lake in the SPOT image was no longer present (Figure 7). Future research will include analyzing more imagery for this area to determine what could have caused this thermokarst area to drain. It would also be interesting to look at other areas of active thermokarst activity in that region.

Spirituality, Mythology and Landsc
Healing Waters of North Carolina.

Amanda J. Todd

University of North Carolina at Greensboro

This research focuses on the non-secular uses and perceptions of natural landscape features in North Carolina. Cultural groups throughout the world consider particular mountains and water features as sacred or culturally meaningful, as evidenced in creation myths, folklore, and/or use as ceremonial grounds. Mountains are often associated as powerful spots providing inspiration; water features are often known for their healing abilities. North Carolina Native American tribes used mountains for inspiration and power through vision-questing and ceremonies, and folklore relates water features as healing places. This research records folklore, stories, and historical documents about mountain landscapes and water features located on public land. Survey questionnaires will be given to the visitors at each site to assess why they visited, how they used the site, and their perceptions of the site. This information will determine if people visit for the same reasons people historically came to the sites: primarily non-secular uses. The information gathered will help preserve a part of North Carolina's cultural legacy, enhance understanding of non-secular use and contemporary landscape perceptions.

Mapping and Detecting Spatial Clusters of Low Birth Weight Incidences in Southeast Georgia

Wei Tu and Kirk McElveen
Department of Geology and Geography
Georgia Southern University

Project Description

Low birth weight (LBW), defined as a live birth weighing less than 2,500 grams, is a prevalent condition in the United States and is a significant predictor of infant mortality. The 2004 LBW rate in the country was reported to be 8.1%, a 16% increase since 1990. In addition, LBW births are at elevated risk of experiencing significant developmental problems including respiratory distress, brain hemorrhage, heart problems, and intestinal abnormalities. Although genetics may be linked to an increased risk of LBW, this condition is strongly associated with many characteristics including socioeconomic (eg - lack of access to health care), behavioral (eg – smoking; nutrition), and demographic (eg – mother's age; race) factors. In Georgia, the unadjusted LBW rate was 9.6% in 2006. When data are controlled for race, the risk for a LBW birth is two times greater among African-Americans (14.4%) compared to whites (7.1%). Moreover, considerable spatial variation exists when examining rates for specific counties in Georgia. In fact, LBW rates may exceed 25% for African-American mothers and 15% for white mothers in certain counties throughout the state. A thorough understanding of the geographic variation, or spatial variability, is then a fundamental requisite for health program planning and control, and for establishing baseline data for subsequent research protocols.

The specific intent of this pilot project is to map and identify significant spatial clusters of LBW cases in Georgia Public Health District 9-1 and 9-2 which includes 24 contiguous counties in southeast Georgia in 2000. First, LBW

incidences will be mapped using three methods, raw density, locally weighted averages, and empirical Bayes smoothing. Second, spatial patterns of LBW incidences will be analyzed and interpreted using two area-based spatial clustering methods in a Geographic Information System (GIS) environment, Anselin's Local Indicator of Spatial Association (LISA) and Rogerson's R Statistic. All the mapping and analyses will be carried at both census tract and zip code area levels and for the total population, African Americans and whites. Finally, the mapping and analytical results will be compared and interpreted.

It is anticipated that this pilot project will lead to a more comprehensive study of the epidemiology of LBW in the entire state of Georgia and at a longer temporal scale. Results gleaned from this preliminary study will also be valuable for other researchers to design more refined observational studies.

Key Words: Low birth weight, Disease Mapping, Spatial clusters, Southeast Georgia

Tree-ring data and estimating maple syrup production in New York.

William P. Tyminski
Carolina Tree-Ring Science Laboratory, UNC-Greensboro

Estimating of agricultural yields provides farmers useful information that may facilitate crop production for the coming year. It is, however, difficult to forecast crop yields when production is particularly sensitive to daily fluctuations in both maximum and minimum temperatures (e.g. maple syrup). The production of maple syrup occurs in both a limited geographical range and under a distinctive temporal period (January through April). Therefore, departures in climate norms in northeastern U.S. may potential influence maple syrup production. Tree-cores from thirty sugar maples (*Acer saccharum*) were collected in the northern Catskills, Otsego County, New York in the summer of 2008. A tree-ring chronology was constructed for the period of 1900-2007 using standard dendrochronological techniques. The standardized tree-ring chronology was lagged four years and then correlated with yearly maple syrup production (yield-per-tap) for New York. Using a 10-year moving average, a significant positive correlation ($r=.460$, $p< 0.01$) was found between the tree-ring index and maple syrup yield. These results suggest the possibility of tree-rings serving as a proxy in reconstructing historical maple syrup yields and additionally the potential as a variable in yield forecasting.

Using Ecological Niche Modeling to Predict Actual and Potential Habitat for the Bog Turtle, *Glyptemys muhlenbergii*

1. INTRODUCTION

Figure 1. The Bog Turtle, *Glyptemys muhlenbergii.* (Photo by Dennis W. Herman)

The bog turtle (*Glyptemys muhlenbergii*) is North America's smallest and most secretive turtle (Figure 1). It has an average size of 3 to 3.75 inches in straight-line carapace length, with distinctive bright yellow to orange patches on its neck (Herman 2003). There are two distinct populations of bog turtles separated by an apparent 250 mile disjunct: the northern population, which ranges from New York and Massachusetts south to Maryland, and the southern population, which ranges from southwestern Virginia and south to northern Georgia (Ernst et al. 1994) (Figure 2).

The bog turtle is faced with two principle threats: habitat loss, due to the draining and filling of wetlands and, to a lesser degree, the illegal collection of turtles for commercial pet trade demands (Herman 2003).

DENDROCLIMATIC ANALYSIS OF OAK SPECIES IN THE SOUTHERN APPALACHIAN MOUNTAINS, U.S.A.

PHILIP B. WHITE
APPALACHIAN STATE UNIVERSITY

HENRI GRISSINO-MAYER
UNIVERSITY OF TENNESSEE

ABSTRACT

Three oak tree-ring chronologies were developed for dendroclimatological analysis from Griffith Knob and Little Walker Mountain in the Jefferson National Forest, Virginia, and for Gold Mine Trail in the Great Smoky Mountains National Park, Tennessee. We statistically compared the three chronologies with monthly NCDC divisional climatic data from 1930 to 2005. Precipitation correlated significantly and positively (highest $r = 0.50$, $p < 0.0001$) with ring widths during one or more summer months at all sites. Temperature correlated significantly and negatively (lowest $r = -0.36$, $p < 0.002$) at each site during the same period. Tree growth correlated significantly and positively (highest $r = 0.57$, $p < 0.0001$) with both PDSI and PHDI throughout the growing season, with relationships extending into the previous fall at two sites. The climate signal increased in strength on a high to low elevational gradient. The results of this research suggest that oak species in the southern Appalachian Mountains require a cool, moist summer for maximum growth to occur, while fall moisture availability is important for oaks in a warmer and drier climate.

Spatially interpolating rates: a public health application

James L. Wilson, Christopher J. Mansfield, and Denise A. Kirk
Center for Health Services Research and Development, East Carolina University

Abstract

In the absence of universal and systematic geocoding, spatial interpolation of geographic information from one type of administrative/political unit to another can be a useful tool in public health analyses, policy, and decision-making. We demonstrate a dasymetric spatial interpolation technique using US Census blocks for transferring county premature mortality rates to the 435 US Congressional Districts. The resulting reapportioned rates for the congressional districts appear reasonable when compared to rates for those counties circumscribed by congressional districts and to state mortality rates when there is only one congressional district. The question of validity is addressed by comparing recently available North Carolina state legislative district incidence rates based on geocoding to corresponding rates interpolated using the dasymetric technique. Although computationally intensive, this technique is a relatively straightforward alternative means of approximating rates when coordinates are not available for individual vital or registry records.

Keywords: spatial interpolation, mortality and incidence rates

Poster Abstract: Neighborhood Place-Framing, Gentrification, and the Local State

Building from Martin's (2003) idea of neighborhood place-framing, my research question focuses on strategies and practices of neighborhood civic associations attempting to attract investment, create place identity, and gain services. I use a case study methodology of three neighborhoods of in town Atlanta. I have conducted one on one, semi-structured interviews with neighborhood volunteers, as well as participant observation at organization meetings, and archival research from organization literature and materials. This poster will illustrate my findings that place-frames are constructively based on the particular needs of each neighborhood as viewed by participants in the civic organizations.

Yearwood

Poster Title: River Planform Change Downstream of the Sinclair Dam, GA

Abstract: Dams across rivers alter the flow regimes of rivers as well as the delivery of sediment downstream of these structures. This poster presents a study of how the Sinclair Dam completed in 1953 on the Oconee River has affected the degree and rate of the Oconee River to migrate across the floodplain (called planform change) in a 75 km segment downstream of the dam. Geo-spatial techniques analyzing remotely sensed data includes the use of ARCGIS and ERDAS Imagine. Spatial analysis of eight decades of aerial photographs spanning a time period before and after the closure of the dam, show that both spatially and temporally, there is a variation of these migration rates. Overall, the rates of planform change are lower after the completion of the dam.