2010 SEDAAG POSTER ABSTRACTS

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How Robust is the Pre-1931 National Climatic Data Center – Climate Division Dataset? Examples from Georgia and Louisiana

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The National Climatic Data Center's Climate Divisional Dataset (CDD) is commonly used in climate change analyses. This dataset is a spatially continuous dataset for the conterminous United States and is made up of 344 reasonably homogenous climate divisions. Each climate division has the same period of record beginning in 1895 and is kept up to date each month. However, data for the period 1895-1930 are not generated in the same manner as for 1931-2010 because the number of stations was generally considered insufficient to adequately produce climate divisional averages. As a result, data from 1895-1930 in the CDD were synthesized from US Department of Agriculture statewide averages using regression techniques (Guttman and Quayle, 1996). In this analysis, we use data from the Cooperative network of stations from 1897-1930 and generate a comparative divisional dataset. The performance of the methods used to generate the pre-1931 CDD is then evaluated with t-tests, correlations, and linear regressions between the two datasets. Results indicate that the CDD do not always portray the temperature and precipitation in these two states accurately, hence the CDD should not be used indiscriminately to depict climate change in the US without performing similar tests for other climate divisions.

Communities Depends on Red Snapper Fisheries in Florida

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In order to determine the involvement of Florida Gulf Coast communities in the red snapper fishery, and consequently the potential extent of fishery-related decisions on the communities, this study made use of Data Envelopment Analysis (DEA) and estimation frontier technique. Twenty-two communities analyzed for this study and their respective inputs and outputs for both dependence and engagement tests. Dependence is defined as the activity level of a fishery in a community and engagement is defined as a community's involvement in the fishery compared to the Gulf-wide activity level in the fishery. In the output-oriented DEA models employed here each community (DMU) studied uses its population (the input) to generate outputs (e.g. fish landed, fish delivered) in the red snapper fishery. Entering the input and various outputs provides the "efficiency frontier" to be generated, in this case the communities most dependent upon and engaged in the fishery. The study revealed a strong correlation between the DEA analysis of fishing communities affected and the analysis performed by National Marine Fisheries Services (NMFS), and reinforces DEA as method of determining involvement in fishery.

Assessment of GIS and Remote Sensing Response to the Gulf Oil Spill Disaster in Louisiana

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On April 20, 2010, the Deepwater Horizon oil rig leased to BP exploded in the Gulf of Mexico releasing 5000 barrels of oil daily. Oil has since affected miles of Louisiana, Mississippi, and western Florida coastline with its impacts compared to 1979's Ixtoc and 1989 Exxon Valdez spills. The BP Deepwater Horizon Incident Command Center in Houma was developed to coordinate response efforts and is a center of collaboration on mitigation as well as GIS analysis. The U.S. Coast Guard also established an Incident Command Center in Robert and later in New Orleans. This research reports on interviews with federal, state, academic, and commercial respondents to the disaster conducted in order to identify: 1) what kinds of GIS and remote sensing data are being used to assist in the response, and 2) how effectively GIS data been exchanged amongst groups working on the response effort. Preliminary results indicate unique response efforts integrating many federal agencies and a commercial enterprise and use of cutting edge GIS and remote sensing technologies. While respondents indicate the overall response is effective, many concerns remain about the long term data management needed for monitoring the ecological and socioeconomic impacts.

Segregation Academies in Mississippi

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The history and relevance of the private school in Mississippi is one that ebbs and flows, along with its popularity as a viable alternative to public education. Academies, prep schools, private schools, segregation academies, parochial schools and others all fit under the umbrella of the non-public schools; collectively to be called 'academies'. They encompass a range of financial and governing independence, accrediting bodies, curriculum, student selectivity, and social status. The purpose of this research is to dive into the nature of the academy; what it is, what it means, and how it has evolved, with particular attention paid to the Civil Rights era and Mississippi's attempts to avoid integration in education. The story of Mississippi between the 1950s to the 1970s is the story of much of the American South, and although the information presented here is particular to that state, it could easily serve as a proxy for other southern states and a microcosm of the south itself. A renewal of research into academy populations and distribution is also presented, showing a full timeline of segregation academies.

Using Low Cost Survey Methods to Measure Beach Profile change on Saba, Netherlands Antilles

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Saba is a small (13 square km) island in the Caribbean Lesser Antilles leeward island group. It is unusual for the Caribbean in that it has only one sandy beach, which only appears seasonally. The other beaches are volcanic cobble beaches. This poster describes the low cost survey methods used to collect beach profile data on the island of Saba. It is a device that can be simply made for under $10 from supplies form a local Home Depot type store. It can not only be used for beach profiling but also any other slope measurement activities within geography. Because the beaches are rocky-cobble beaches, There has been no previous research detailing the spatial and temporal changes on these Saban beaches. Beach profile data was collected from January 2008 to August 2010. Beach profiles were plotted and then analyzed using the ArcGIS 10 Time Slider window which provides controls that allows visualization of temporal data in the ArcGIS Desktop applications. Analysis of the data shows that the beach did not respond to fair weather waves and currents but can be significantly modified by large hurricane generated waves and swells.

Developing a Conservation Suitability GIS Model for Land Trust Priorities in Eastern Tennessee

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GIS can both enhance and hinder land trust's conservation planning and decision-making processes. This study performed for the Land Trust for Tennessee illustrates a conservation suitability GIS model for Eastern Tennessee, while also providing an avenue for future public input though use of a flexible GIS model. Following data acquisition, a series of steps were integrated into ArcGIS's ModelBuilder. In the weighted model, ecological layers were given 30% of the weight and farmland and open-space derived layers were given 70% based on land trust input. The unweighted model output gave a relatively accurate picture of the Land Trust's focus areas. There is a heavy emphasis on the forested "islands" of private property amidst the Cherokee National Forest, as these areas both border public land and have high ecological indices. The weighted model gives a slightly higher rank to the more agricultural conservation features, as displayed by the darker colors. The area around Roan Mountain, TN is an area of high ecological influence and therefore is lighter in the weighted version of the model. This mirrors this land trusts focus on working landscapes and cultural heritage, while other conservation groups focus on regions important to biodiversity.

Utilizing TRMM to Analyze Sea Breeze Thunderstorm Patterns During El Nino Southern Oscillations and their Effects Upon Available Fresh Water for South Florida Agricultural Planning and Management

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This project uses data from the Tropical Rainfall Measurement Mission (TRMM) satellite to analyze how sea breeze-generated thunderstorms during El Nino and La Nina have influenced interannual patterns of precipitation in southern Florida from 1998-2009. The Precipitation Radar and Microwave Imager from TRMM have the potential to provide data about precipitation rates and accumulation, and the distribution of precipitation. Through the use of TRMM and Landsat, slight variations were observed. However it was determined that neither sea breeze nor total rainfall patterns in South Florida were strongly affected by ENSO during the study period. More research is needed to characterize the influence of ENSO on summer weather patterns in South Florida. This research will provide the basis for continued study with the Global Precipitation Measurement Mission.

The Use of Post-Event LiDAR Data for Building Damage Assessment

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Remote sensing approaches may be used to quickly assess structural damage in the wake of a disaster, and in so doing allow for emergency managers to allocate resources quickly to the hardest hit areas. Key among the emerging remote sensing technologies is Light Detection and Ranging (LiDAR). Able to quickly determine damage in three dimensions, this technology creates an opportunity to generate a far more detailed awareness of the situation on the ground than other two dimensional methods such as photogrammetric analysis. Moreover, LiDAR collections can take place at any hour, including nighttime missions, further increasing the likelihood of quick data acquisitions. While processing LiDAR does present significant opportunities to affect better disaster responses, most places in the world are incapable of flying missions prior to a disaster. This objective in this research was to develop an approach for leveraging post-event LiDAR data as a damage assessment tool without pre-existing three dimensional data of buildings in an area. In this study, post-Hurricane Katrina LiDAR data gathered in Long Beach, Mississippi and pre-event building footprint data were exploited both independently and together for mapping structural damage at the parcel scale of analysis. Through raster-based analysis, the results show that the approach developed in this research was highly effective at detecting parcel damage from Katrina's storm surge. However, the results are less accurate in this approach as distance from the zone of impact increased.

Analyzing Microclimatic Conditions inside Bryant-Denny Stadium Following Stadium Expansion

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In this study, temperature and dew point data are collected from inside Bryant-Denny Stadium during the 2009 and 2010 football seasons to assess the variability in the stadium microclimate following the stadium expansion from 92,000 to over 101,000 seats completed in the summer of 2010. Data collected at one-minute increments from eight locations during the 2009 football season are compared to data collected from the same locations in 2010, in addition to three sensors placed in the new southern upper deck. Results indicate the stadium expansion has increased temperatures inside the stadium, primarily at locations in the lower portion of the stadium and near field level. Dew point data analyzed between the two study periods indicated higher moisture values in the lower regions of the stadium. It is hypothesized that the reduction in airflow through the stadium has reduced sensible heat release that occurred prior to the expansion of the stadium.

An investigation of Casuarina equisetifolia (Australian pine) modification of the environment through potential allelopathy on San Salvador Island, The Bahamas

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Casuarina equisetifolia L. is a noxious plant species considered to be invasive in the West Indies. Not much is known about how it spreads or the impact it has on the host environment. It is suggested C. equisetifolia affects coastal dune formation because it possesses shallow root mats which contribute to erosion during strong winds. Because few native plants are present in the understory of C. equisetifolia dominated areas, it has also been suggested that it employs allelopathy, which is the release biochemicals into the soil via leaf litter whereby suppressing native plant seed germination and growth. This study conducted growth chamber experiments to determine C. equisetifolia's potential for allelopathy by applying C. equisetifolia leachate to common cultivars of bean (Phaseolus vulgaris) and radish (Raphanus sativus). Results showed reduction in bean and radish seed germination by at least 32% and 70% respectively. However, bean and radish seedlings showed no growth suppression with applications of C. equisetifolia leachate. Investigation with liquid chromatography mass spectrometry (LC-MS) revealed the potential presence of the allelochemical chalepin. This research demonstrates that C. equisetifolia may have the potential to modify its environment through allelopathy, perpetuating its existence as a noxious invasive species across the West Indies.

The Geography of SCUBA Diving in the Caribbean Islands

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SCUBA diving has recently become a global phenomenon, with dive sites around the world. This research project looked at the geography of SCUBA diving in the Caribbean. There is little peer-reviewed literature on the geographical distribution of SCUBA diving, so much of the research used websites. Additional data were collected for different islands in the Caribbean. Also there were research articles pertaining to the effects of SCUBA diving in different locations, usually focusing on dive sites that were the most heavily used. This gave the context for why it is important to know the spatial distribution of SCUBA diving. In the course of the research, it was discovered that several websites included interactive maps of SCUBA sites around the world and in the Caribbean. This poster discusses the limitations of collecting data about SCUBA diving. Since there is no comprehensive source for this kind of data, this project serves as a data review to consolidate existing information in order to understand the spatial distribution of SCUBA diving in the Caribbean. The different data were collected, combined into one database, and then mapped in order to look for spatial relationships that can only be seen visually.

A synoptic analysis of the historic 2010 Mid-South flood

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During 1-2 May, 2010 the Mid-South region of the United States experienced a 1000-year extreme rainfall event, which negatively affected > 11,000 parcels of land, led to 31 casualties, and left behind > $2 billion in property damages. Portions of Tennessee and Kentucky received rainfall amounts (e.g., > 254 mm) within a 48-hr. period, which surpassed existing monthly rainfall records. The purpose of this study was to highlight the synoptic environment that contributed to this extreme event. The large-scale circulation, in part of which was influenced by phasing of the North Atlantic Oscillation, was an optimal atmospheric environment conducive for this extreme event. In particular, anomalous 500 hPa heights off the southeast coast, coupled with blocking in the northern Atlantic helped to slow down the advancing polar front along the Mississippi River. Ahead of this frontal boundary in the warm sector, southerly return flow from the Gulf of Mexico supplied the region with ample low-level moisture. With the region primed for heavy precipitation, storm motions were a critical contributing factor to the floods. Specifically, as the event unfolded a series of successive storms with intense rain rates trained across rivers, streams, and other tributaries that had already reached bank-full capacity.

Making Music Sustainable: The Case of Marketing Summer Jamband Festivals 2010

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Abstract: Environmental sustainability and "green" values are heavily promoted when marketing jamband music festivals. Festival promoters often take advantage of/exploit this popular issue in attempts at drawing in the largest target audience possible by marketing their festivals as "green" and environmentally sustainable; for example promoting "green" activities during the festival and publishing sustainable statistics on their promotional websites. This research examines the "green" promotions and attitudes of those in attendance at the Summer Camp Music Festival in Chillicothe, IL, the Bonnaroo Music and Arts Festival in Manchester, TN, and the High Sierra Music Festival in Quincy, CA. At each festival, surveys were administered to a random sample of festival goers and "green" on-site promotions were documented. The results reveal that those in attendance at the High Sierra Music Festival in California were more environmentally conscious followed by those in Illinois, with festival goers in Tennessee being the least environmentally conscious. Inversely, observations at each of the three festivals revealed that on-site promotions of "green" and sustainable values were more prominent at those festivals where the audience members cared the least about environmental sustainability.

Assessing Climate Change in Alabama Using Climate Normals

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This study assesses climate change in the state of Alabama using a climate normals based approach. Climate normals consist of monthly average temperature and precipitation values, computed over a thirty-year period. The earliest normals available for Alabama are those from 1931 - 60, the most recent from 1971 - 2000. The normals periods analyzed here are those for 1951 - 80, 1961 - 90, and 1971 - 2000. These periods have a relatively consistent set of weather stations, 40 in total, located across the state. Changes in temperature between these periods are calculated for these stations, revealing changes at the annual and seasonal scale over the last half of the twentieth century. In general, temperatures decreased between the 1951 - 80 normals periods and increased between the 1961 - 90 and 1971 - 2000 periods. The same pattern is seen at the seasonal scale, although there were greater changes during winter than summer.

Previous Experience and Preparedness during the 2008 Super Tuesday Tornado Disaster at Macon County, TN

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Previous experience with a natural hazard might lead to a greater level of awareness and preparedness for future threats, or it might lead to complacency. This paper presents preliminary findings on a study of the influence of previous experience on preparedness for a tornado. The research was conducted in Macon County, TN, which suffered the highest number of tornado-related fatalities (13) during the 2008 Super Tuesday Tornado Outbreak. A post-disaster survey included 127 local residents who were present during the tornado. Thirty-seven of the survey participants (29%) indicated that they had previously been in a tornado disaster. Participants with previous experience were less likely to have an emergency response plan for seeking shelter than those with no previous experience (57% vs. 61%), less likely to own an emergency weather radio (5% vs. 8%), and more likely to live in a mobile home (49% vs. 29%). However, they were more likely to perceive that they were in personal danger when they received the warning (70% vs 49%), and they were more likely to have a greater perception of danger.

Constructing Coloniality: Federal Photography in the Depression-era South

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This research explores the theme of coloniality in the 1930s U.S. South. The research argues that as a precursor to and a justification for intervention within the region, the federal government constructed the South as a subordinate, dependent and colonial-like space. This work examines the construction of southern coloniality through visual culture, namely through images of southerners produced by federal photographers. The research draws parallels between these photographs and the practices associated with colonial photography of the mid-nineteenth to early-twentieth centuries. The research finds that within the photo collection, agrarian white southerners residing in federally funded farm communities were cast as the modern ideal, while black southerners – commonly portrayed as fieldworkers – were the colonial "primitives" against which white modernity was contrasted. In the photos, poor white rural southerners occupy a position along the continuum between primitiveness and modernity. There is a parallel, then, between these images and colonial depictions of "noble savages," as both the colonial savage of the 1800s and the poor white southerner of the 1930s were considered inherently redeemable.

(In)visible Bodies in the Geopolitical Realm: The Battle for Kurdish National Identity on Facebook

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For nations without a state such as Kurdistan, Facebook provides a vital forum for stirring up strong feelings of support and carve out justification for the formation of a Kurdish state, as well as counteract the Turkish assumption that idea of an independent Kurdistan is invalid. Each group expresses strong feelings about their position and their conflicting national vision that shares the same physical space. Images from these expressions of national identity highlight two sides of representations of the human body by using images of women, children and men to either convey a sense of something to defend or something embarrassing used to defile other men. Women, children, and even men embodied as objects, not participants in the use of their images to express national identity, provide justification for subjugation of subtypes of the population. Examination of these images and the roles they play in symbolism, content, production, and reproduction of national identity help us to understand the emotions, attitudes, values and interests of pro- and anti- Kurdish nationals.

How do rural, urban, and suburban students differ on their performance on standardized tests?

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Academic achievement is a subject that has been studied at a variety of levels and from a variety of angles, but very rarely has it been studied from a spatial perspective using individual schools as the level of analysis. A spatial perspective on achievement can illustrate the differences among rural, suburban, and urban areas, even within the same metro area. Mecklenburg County is the most populous county in North Carolina, and Charlotte-Mecklenburg Schools has the second highest enrollment in the state, but surrounding this urban center are a variety of suburban and even rural schools. Using North Carolina's EOG (End of Grade) and EOC (End of Course), this vibrant region is the study area for this research. These scores will be used to determine if there is a difference between the three locale's over five years, starting in the 2004-2005 school year, for all students, as well as separated by ethnic group and a measure of SES (Socio-economic Status).

Impacts of Drought on Kentucky's Agriculture

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Climatic phenomena can have environmental, economical, and social impacts. Drought is a climatic phenomena and hazard that affects these aspects of society. It is one of the most complex and least understood. There is no universally accepted definition for drought which makes its examination difficult. Droughts' duration is also difficult to determine because it has no clearly defined onset and end time. Since there are many different definitions, a number of drought indexes exist for its examination. The most common and widely used is the Palmer Drought Severity Index (PDSI). Drought has been recorded historically in Kentucky since the late 1800s. Based on PDSI and according to the Kentucky Climate Center, the most significant droughts in Kentucky occurred in 1930-31, 1940-42, 1952-55, 1987-88, 1999-2000, and 2007. The purpose of this research is to estimate droughts' impacts (in dollars) on Kentucky's agriculture. Impact assessment of drought is necessary so that response and mitigation policies can be implemented. This information will be useful to the general public, as well as policy makers, by assisting in decision-making for reducing drought related risks in the future. Key Words: Drought, Impact Assessment, Agriculture.

Remote sensing application to study the ice cap of Mt Agri (Ararat) in Turkey

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Global climate change and retreat of glaciers are interrelated. Although, there are a vast number of studies on the conditions of glaciers throughout the world, the literature on glaciers in the Middle East are very sparse. In this study, we analyzed the change in ice cap area of one of the historically significant mountains - Mt. Agri (Ararat) in eastern Turkey. In these rugged mountainous landscapes, multi-temporal satellite images are ideal to study the change in surface area of the ice cap. We used Landsat satellite images acquired at the end of melt season to determine the change in the area of the ice cap on Mt Agri from 1984 to 2010. Digital elevation model developed from Aster satellite images was used to create a 3D visualization of the mountain. The results indicated that ice cap area varied significantly over the study period. The area of the ice cap including glaciates and firn patches was 17.07 sq. km in 1984, has changed to 12.27 sq. km in 1989, 11.26 sq. km in 2000 and 15.90 sq. km in the year 2010.

Mapping North Carolina Seagrass

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The Albemarle-Pamlico National Estuary Program (APNEP) began a research project lead by the APNEP SAV Partners that is aiming to develop seagrass mapping methods that can be used to map seagrass coverage for the North Carolina estuarine coast. It was determined by the SAV Partners that a method incorporating remote sensing, underwater video and sonar acoustic would be the best way to map seagrass and assess change statewide over time. Starting in May 2010 the utility and accuracy of sonar acoustics has been under investigation. Four study sites located throughout the North Carolina estuarine system have been selected, two low salinity sites and two high salinity sites. Each site has been surveyed at least twice and the results of each survey thus far have been preliminarily analyzed using ArcMap. Change detection has been performed between each of the two surveys at each site to quantify any change that occurred between surveys. The study is currently being furthered by incorporating Digital Globe's latest satellite, WorldView-2 (WV-2) and the "Coastal" band. An accuracy assessment of the acoustic data and image classification accuracies will be performed using ground reference data gathered from quadrats.

Particulate Carbon Storage and In-Channel River Deposits: An Overlooked Carbon Storage Zone?

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This research examines the role of rivers in cycling carbon on continents. Most research concerning carbon cycling in rivers focuses on quantifying the storage of carbon in floodplain soils or measuring dissolved carbon in river water. Few studies examine in-channel sediment storage features and their potential to store organic matter. We sampled sediment from a large in-channel bench located in a stream in northeast Alabama and analyzed the sediment for particulate organic matter content. We used the results to calculate total organic matter stored in the bench. Our results suggest that in-channel benches can store organic carbon in the form of organic matter in quantities reported for floodplain environments, meaning these sediment storage features may be an important, yet overlooked, component of the carbon cycle in many rivers.

Dendroclimatology of Bristlecone Pine (Pinus longaeva) During the 20TH Century

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Bristlecone pine is the oldest known living tree species on Earth, with individual trees reaching an age of over 4,000 years. Therefore, this species is considered a valuable source for reconstructing paleoclimate at an annual resolution. These reconstructions are only reliable, however, when the relationships between the targeted environmental factors and the chronology are stable over time. Despite their unique place in dendrochronological literature, reports on the climatic relationships important to bristlecone pine growth have been inconsistent and vary by elevation. Using previously collected cores from low elevation bristlecones, we examined the correlations between local and global climatic variables and tree-ring response. We additionally performed a wavelet analysis to investigate periodicity in the bristlecone chronology and its relationship to the Pacific Decadal Oscillation (PDO). During our period of study (1895 to 2001), spring precipitation and stream flow produced the strongest positive correlations with ring width. Significant correlations were also found with stream flow (positive) and temperature (negative) which were also stable over time. Overall, the strong, stable relationship between ring width and regional precipitation could provide a reliable basis for a future climatic reconstruction of local and global climate.

Analyzing Watersheds and Coastal Features on a Volcanic Caribbean Island: Saba, Netherland Antilles

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Small independent islands typically do not have the infrastructure or knowledge to effectively use GIS. On the Caribbean island of Saba, The Saba Conservation Foundation has been using volunteer geographers to create a local GIS. Many basic mapping projects have been done with this data and we are working with them on tropical coastal management applications. The purpose of this research was to analyze the spatial relationships between watersheds and their adjacent coastal and offshore features (such as cliff and coral reefs). The research design included using topographic layers to create a DEM, using the DEM for watershed analysis, and using spatial analysis to define regional geomorphic characteristics. This poster will discuss how DEMs may not always yield a good representation of the real world, and how additional tools may be used to edit the DEM to improve the resulting delineations. This poster will also show illustrations of the watershed coastal connections on Saba and how the underlying volcanic geology and size of the watershed influences the type of coastal and near shore features and sediment types.

Spatial Analysis of SCUBA Diving of Saba

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Saba is an island in the Caribbean that is entirely surrounded by a marine park. Because the water surrounding Saba are protected and monitored by the Saba Marine Park, the coral reefs surrounding the island are some of the best in the region. Using Saba Marine Park data, this poster shows spatial and temporal distributions of the amount of divers per month per dive site from 1994-2009. One question posed was why some dive sites have fewer or more divers during a period of time. Some of the analysis found suggests that some buoys where broken during a period of time or there were significant strong currents. Another research question looked at the temporal patterns in the yearly data. Some years had fewer divers because of a higher vulnerability to hurricanes and other low years due to an economic recession around the world. Data was gathered and organized to create an excel document that was joined to existing ArcGIS Saba data layers. This was done for every month over the 16 year time period. The goal was to find spatial and temporal patterns in the increase or decrease of the number of divers in certain areas.

Understanding Temperature Prediction and the Probability of Precipitation: What Does the Forecast Really Tell Us?

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The accuracy of a weather forecast has far-reaching implications, from planning ordinary activities to preparing for extreme events such as heat waves and flash floods. The objective of this study is to assess the accuracy of short-term temperature and precipitation forecasts in the Piedmont of North Carolina. To accomplish this, the 12-hour to 7-day tabular forecasts of daily maximum and minimum temperature for Greensboro and Raleigh-Durham are compared to the observed daily maximum and minimum temperatures over the period March 2009 to May 2010. Additionally, precipitation forecasts (i.e. probability of precipitation) over the same period for Raleigh-Durham are compared to the observed precipitation totals measured over 6-hour increments. There exists significant seasonal variability in the relative accuracy of temperature forecasts across forecast periods. This may be related to the accuracy of the weather models and unusual weather patterns observed over the analysis period. Additionally, greater specificity may be added to a probabilistic precipitation forecast by incorporating information on the timing and amount of precipitation.

Impacts of Selection of Various WRF Parameterization Schemes Combinations for a 2008 Ohio Valley Squall Line Event

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On January 29th and 30th of 2008 a squall line of thunderstorms moved through the Ohio valley with over 300 reports of severe weather. This study analyzes impacts of selection of various parameterization schemes from the Weather Research and Forecast (WRF) model on accuracy of simulations. We have considered microphysics, cumulus, and the planetary boundary layer schemes for this purpose. With different parameterization scheme combinations we have conducted 12 simulations to fulfill the objective of this study. Results of these simulations were compared to the Kentucky Mesonet data observed at four locations for air temperature, dewpoint temperature, relative humidity, and precipitation. Overall the most satisfactory combination of schemes included the WRF single-moment 3 class Microphysics Scheme (WSM3) for microphysics, Kain-Fritsch (KF) for cumulus parameterization and Yonsei University Scheme (YSU) for the boundary layer. These results also may lead to future studies investigating other squall line events and better aid forecasters when squall line events are expected.

Emphasizing ‘science’ in a weather and climate laboratory course

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Joseph Nicholas

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This poster describes three hypothesis-testing experiments that students perform in our weather & climate laboratory course, which is a natural science general education course. The experiments are simple enough that students can write valid hypotheses, but complex enough that students do not always predict correct results or give appropriate justifications for their predictions. Each experiment is directly related to class content; students also learn about experiment design and data collection, how to graph results, and how to write a standard scientific report. The impetus for these experiments was our need to better teach the scientific method. Questionnaires given at the beginning and end of Fall 2009 courses illustrate students’ lack of knowledge about scientific thinking in general and about the scientific method and definitions of hypothesis and theory in particular. By assessing our students at the beginning and end of each fall semester, and adjusting our teaching styles and content, we are hoping to see an improvement in their knowledge of science.

Dendrochronological Dating of Wood from the Fountain of Youth Park Site (8SJ31), St. Augustine, Florida, U.S.A.

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The city of St. Augustine, Florida holds particular historical significance as the oldest continuously occupied European community in the continental United States. Settled in 1565, it holds great educational, historical, and anthropological interest for current researchers. Recent archaeological excavations produced two large (ca. 20 cm diameter) posts from the Fountain of Youth Park site. Our objective in this project was to use tree-ring dating to determine the outermost dates of the two posts. Sample 8SJ31-2741 was pine (likely longleaf pine) and contained tree rings that were successfully crossdated using the Lake Louise reference chronology from southern Georgia to AD 1620–1668. Sample 8SJ31-2766 was a bald cypress sample that we could not crossdate using a nearby reference chronology from the Altamaha River in southern Georgia. Based on the troublesome ring characteristics on this sample, dating of this sample is not currently possible. This project demonstrates the feasibility of dating wood extracted from sites from the historic Spanish-era period in the southeastern United States.

The contribution of thunderstorm and nonconvective high winds from post-tropical storm systems

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During 1951-2009, 47% of all tropical systems within the Atlantic Basin transitioned to post-tropical extratropical classification. These systems are capable of producing hurricane-force winds across portions of the eastern United States. This study provides a climatological foundation for high-wind observations that are due to post-tropical storm systems. Post-tropical storms were identified and tracked using six hourly observations from the National Hurricane Center's HURDAT dataset. Mean wind radii buffers were used to determine the high-wind observations attributed to post-tropical storms. For this study, the geography and climatology of post-tropical storms and resultant high winds were analyzed using geographic information systems. Initial findings show that of the 47% of all post-tropical systems, 25% made landfall in the U.S. and were used for this study. Post-tropical systems primarily occur between 41°N-45°N, east of 100°W, with a mean migration toward the northeast. Recent hazard statistics from the National Weather Service show that 574 fatalities in the eastern U.S. were attributed to thunderstorm and nonconvective high-wind observations over the last 15 years. The goal of this study is determine the contribution of high winds from post-tropical storms, with the aim of improving our understanding of the hazardous outcomes of such events.

Factors influencing restoration success of arid region abandoned agricultural fields.

Carla Gray

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Abandonment of agricultural fields is a common occurrence worldwide. Natural recovery, or succession, often occurs following land abandonment. However, in arid regions succession may not occur and active restoration techniques are sometimes used to facilitate native vegetation growth. Along the lower San Pedro River in southeastern Arizona, restoration projects have resulted in mixed success. Though some fields have responded to restoration treatments, others have not. Abiotic and biotic factors likely affecting restoration outcomes in this arid environment include soil conditions, climatic patterns, and seed availability. We examined predictor variables to identify which environmental factors most influenced vegetation characteristics of abandoned agricultural fields on river terraces. To do this, GIS-based site suitability analysis was used to identify abandoned agricultural fields, and field data were collected in 20 fields during summer 2010. Woody species richness, stem density, and basal area were recorded in 3 100m^2 study plots in each field. Soil samples were collected and pH and particle size analysis performed. Preliminary results show alkaline soil conditions at field sites. Historical climate records show that drought occurs on a 6-8 year cycle. Management information describe a long history of cultivation at sites. These findings point toward lingering agricultural legacies impeding restoration efforts.

Effects of Land Use and Land Management on Near-Surface Soil Moisture in Andean Páramos

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To what extent is the moisture content of páramo soil at a given time related to differences in land use? This research tested the hypothesis that comparable measurements in the upper 12 cm of soil would show higher moisture content under frequently or infrequently burned páramo grass than under shrubby or woody vegetation. This research was part of a larger project undertaken at two study areas in Andean Ecuador to provide a scientific foundation for understanding the trade-offs associated with different environmental management decisions. In each area, we compared soil characteristics at sites representing different land uses and land-management strategies. To compare the moisture content of the upper 12 cm of the soil, we established three 20-m transects at each site and took 30 instantaneous readings of volumetric soil moisture across each transect, using Campbell Scientific CS620/CD620 hand-held probes with 12-cm probe rods. Here, we report results from the 2010 field season in the Mazar Wildlife Reserve study area. Soils under grass were consistently wetter than soils under pine plantations or soils at shrubby sites, and the variance for soil volumetric water content was an order of magnitude less under frequently or infrequently burned grassland than under pine trees.

Using ArcGIS on the iPhone for Campus and Study Abroad Applications

Seth Harkness

Samford University

Many geography classes use mobile technology to help students learn about the local area. Most college students have cell phones including iPhones . According to ESRI, The iPhone has shaken up the smartphone industry. It's a powerful, flexible and connected platform. Recently ESRI has added an ArcGIS free application for the iPhone. This study reviews the ArcGIS and other similar iPhone applications. In addition a small survey was conducted with 10 students at a university to see how they utilized the free iPhone application. They were asked to perform several geospatial tasks like search, ID, measure and query. Suggestions are made on how this technology could be used in a geography classroom setting. Additionally, the iPhone applications was used in a test scenario for a study abroad program in the Caribbean. Use of the iPhone ArcGIS application on the small Ditch island of Saba was used to demonstrate its capabilities for international students and also for tourists to navigate the local urban areas and for hiking the existing trails. This case study is still under development but initial results will be discussed. Also, additional site-specific information for the college campus and study abroad geographic areas will be discussed.

Dendrochronological Dating of the Lund-Spathelf House, Ann Arbor, Michigan, U.S.A.

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The Lund-Spathelf House is located at 1526 Pontiac Trail in Ann Arbor, Michigan. During a recent renovation, the owner sought information regarding the construction of the house by searching through numerous written records. Despite an extensive history of the land on which the house currently sits, neither a construction year nor general period of construction could be obtained. Several samples of oak (Quercus spp.) in the white oak group were extracted from floor boards throughout the house for dendrochronological dating. The objective of our study was to determine the year in which the house was constructed based on cutting dates obtained from the boards. Four sections were used to build a floating tree-ring chronology 126 years in length from series that crossdated conclusively with each other both visually and statistically. We used COFECHA to statistically evaluate the absolute temporal placement of this chronology against a nearby regional chronology (MI005.CRN) from the Cranbrook Institute, Michigan. The chronology developed from the Lund-Spathelf House samples was anchored in time with the regional chronology from 1720 to 1845 with a correlation coefficient of 0.62 ($p < 0.0001$, $t < 8.76$, $n = 126$). All four oak samples provided a conclusive cutting date of 1845, indicating the year the Lund-Spathelf House was constructed.

Regional Variability of Ecuadorian Andean Soils and the Impacts of Land Management on Their Properties

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The soils of the Ecuadorian Andes are very unique in composition. These soils, mostly Andisols, are composed of volcanic ash and high amounts of organic matter. Andisols are the least extensive soil order and only cover ~1.7% of the Earth's land surface. Gravimetric water contents were especially high in samples taken from two study areas in our research over the past two summers. These two study areas, a northern and southern area, were selected for regional variability and to better compare land management practices across Ecuador. This research is part of a larger project that provides a scientific foundation for understanding carbon and water relationships and how they relate to land use. Included in this assessment is the amount of precipitation the study areas receive as well as the proximity to local volcanoes. Vegetation was described for the carbon analysis and was used to differentiate the two study areas. Soil pits were dug and the soil's physical properties were described at a total of 13 sites in the two study areas. Included in the analyses are bulk density values, water retention curves and particle size comparisons. The southern study area was much wetter than our northern study area and showed less drastic changes in soil properties under different land use. Land uses used for this research were frequent and infrequent burning as well as woody shrubs and pine plantations. Soils under infrequently burned sites were consistently wetter than those under woody shrubs and pine trees. Soil structure was the most significantly different soil property in woody shrubs and pine trees than those in frequently and infrequently burned sites.

Mapping the spread of sudden oak death disease via stream baiting in California watersheds

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The Sudden Oak Death disease, caused by the rapidly spreading plant pathogen Phytophthora ramorum, has killed tens of thousands of trees in forest ecosystems of California. While the rapid discovery of the pathogen is essential to identify currently infested locations and predict future disease spread, stream monitoring can facilitate disease detection even before symptoms are apparent. To address the instigation of spread, I evaluate the role of watershed properties and hydrological connectivity in explaining the probability of disease infection. I established 145 stream baiting plots in which the pathogen's presence or absence was assessed during the period of 2004–2009, and used logistic regression to model probability of infection based on five GIS-derived environmental variables. I included (i) the "Force of Infection" component accounting for inoculum pressure and potential dispersal from tree to tree via rain and wind, and (ii) the cost-distance analysis assessing the importance of hydrological connectivity for inoculum transport in watersheds. The next steps consist of a survival analysis, in which I will model time to an outbreak, and a multiscale analysis assessing influence of the immediate neighborhood of the stream baiting site. Knowing the spatial and temporal characteristics of the disease spread at a watershed level will allow developing more efficient strategies of prevention and avoid major economic losses as well as consequences on biodiversity of ecosystems.

Magic City Railroad Re-imagined

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The poster will exhibit Birmingham, Alabama's brand-new Railroad Park, located between the city's downtown business district and the campus of the University of Alabama at Birmingham. Railroad Park is located on ground that gave birth to the Magic City, but after decades of neglect and abandonment, many thought this "railroad reservation", the one-thousand feet of unused land on either side of the downtown rail lines, had no potential for development. However, on September 18, 2010, the first phase of a proposed two hundred-acre Railroad Park will open to the public. Through the use of historic photographs, planning documents of the past and present, promotional materials, academic studies on urban revitalization, and interviews with local experts, this poster will introduce Birmingham's railroading history through an archival study of the railroad reservation and its transformation into Railroad Park. Exercising all of these methods will also permit a critical evaluation on the planning, creation, and public reception of Railroad Park after its opening on September 18.

Integrating geospatial knowledge into bibliographies: an example from the Africa Infectious Disease Bibliographic Information System (AID-BIS)

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Despite the increasing awareness of the potential of web mapping for displaying dynamic location-based information, there exist few theoretical or practical efforts which accommodate web-based GIS functions into information system design for improving system capabilities with precise location knowledge extracted directly from data input. This paper introduces the Africa Infectious Disease Bibliographic Information System (AID-BIS), which integrates a web-mapping capability with a bibliographic database to capture data from peer-reviewed literature and disease reports and display geographic locations of disease outbreaks or studies specific to disease ecology or transmission. In its current implementation, AID-BIS captures data attributes specific to the occurrence, prevalence, and diagnostics of select agent diseases in Kenya, Tanzania, and Uganda and links those occurrences with geospatial data. AID-BIS is populated, updated, and edited from a user-friendly data entry webpage, where the user can input specific attributes from papers or Promed Mail reports (www.promedmail.org). Once a paper is entered, we employ a Google Map API to display the geographic information captured in the paper and a database to store outbreak-specific attributes. This provides the users with a bibliographic toolbox for exporting references, mapping disease events, and a query-able database for evaluating multiple pathogens of interest. Here we conceptualize a set of generic design patterns from AID-BIS providing a framework for the development of a flexible and dynamic web-based GIS information system which reinforces decision making process with detailed location information that can be utilized in other similar systems.

Using digital images for the geologic mapping of Little River Canyon National Preserve.

Andy Hug

Kelly D. Gregg

Doug Clark

Jonathan Herbert

Jacksonville State University

Little River Canyon National Preserve, located in northeastern Alabama, protects a deeply incised canyon twelve miles long and 200 meters deep. This project explores the use of digital images of the canyon walls as a substitute for traditional field work to create geological maps. Also, these images will provide baseline data for studies of mass movements and of boulders moving as bedload. As a test, a half mile of the canyon was selected. Over 500 high-resolution, overlapping images were made of the east canyon wall. GPS was used to geo-reference each position. Vertically adjacent images were digitally "stitched" together to create stratigraphic columns, on which visually obvious rock units were delineated. The images were then stitched horizontally to reveal the lateral extent of these units and structural relationships. Delineations were ground-truthed at three locations that allowed safe access. Ten distinctive rock units were mapped. The most significant of these produce local baselevels and stream nickpoints. Structurally, these layers dip approximately 0.9 degrees southwest, as part of a large syncline.

A convective climatology for the Green River watershed in Kentucky

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Josh Durkee[3]

[1]University of Georgia

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The purpose of this study was to construct a warm-season (spring-summer) convective climatology for the Green River watershed in central-western Kentucky during 1979-2009. This region is primarily utilized for agriculture, which raises concerns for water quality as pollutants (e.g., fertilizers) are transported through the watershed. This climatology was derived from daily precipitation reports from NWS COOP weather stations. Surface METAR observations, Daily Weather Maps from the NCEP and radiosonde data were used to classify five types of precipitation days: synoptic; frontal; wraparound; tropical; 'other'. Our study shows that there was at least one precipitation day observed within the watershed during 66% of the study period. However, when examining the spatial distribution of the total number of precipitation days for each individual station, the totals ranged from 19-31%. Synoptic and 'other' events were most frequent during the spring and summer seasons, respectively. Since 'other' events exhibited a summer preference, these events were sub-classified by air-mass types and proximity to surface frontal boundaries to determine whether these storm types initiated under synoptically benign conditions. For this classification, 84% occurred under these conditions. Future studies will focus on relating precipitation totals and intensities with each convective classification, and streamflow characteristics within the watershed.

Lidar-Based Morphometry of Small Gullies Under Forest Canopy in the Southeastern Piedmont

Kirsten Hunt

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The detection, measurement, and monitoring of anthropogenic gullies via airborne lidar would be of great benefit to forest and agricultural management procedures in the Eastern United States. However, morphometric analysis using airborne or topographic lidar data may be problematic for several reasons. First, eastern gullies often have an over-story of vegetation. This vegetative over-story (trees and ground cover) obscures laser pulses from both airborne and terrestrial scanners. Second, the nominal post-spacing of airborne lidar sensors may prevent accurate measurement of gully widths and depths. High lidar post-spacing and focused lidar return labeling approaches may provide solutions to these gully detection/characterization impediments. In this research, conventional and focused lidar "bare-Earth" return labeling approaches are compared to a field-surveyed piedmont gully. Two lidar collections with different post-spacing (70cm and 200cm) are also compared. Validation procedures were conducted for gully width, depth, and volume using a reflectorless total-station-based survey. These results suggest a measurement characteristic may be modeled from observed lidar returns and the post spacing factor.

“The Ones Taking Over”: Power and Gender in American Foxhunting

Peggy E. Jackson

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Foxhunting has a clearly defined power structure, one that pre-dates the introduction of the sport to North America in 1650. The three roles of Master of Foxhounds, Huntsman, and Whipper-In are the primary positions within Hunts. This project investigates the relationship of these roles with Foucault and Russell’s theories on power . as well as with theories of radical feminism.

The Effects of Space and Scale on Beta Convergence Models

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In neo-classical growth theory, regional incomes are hypothesized to converge over time. In this framework, regional convergence can be understood in two main forms; beta convergence, where initially poor regions grow faster than regions of initial wealth; and sigma convergence, where there is a decline in the standard deviation of regional incomes over time. The standard test for beta convergence is a bivariate OLS regression, where initial income serves as the predictor against income change. Applied to a variety of scales, this model has produced conflicting results. In order to explore potential reasons for this inconsistency in results, this poster looks at the United States PCPI 1970-2004 at three scales (states, Economic Areas, counties) using both OLS and spatial regression to explore the effects of typical reasons for model inconsistency with spatial data; scale problems and spatial dependence. Results indicate the spatial error model to be a far more robust model than OLS for beta convergence testing, as well as the presence of scale effects, as the largest scale is weak in explanatory power, and the smallest scale fails residual diagnostics.

Examination of crop yield versus rainfall in Jamaica

Sarah Jessop

East Carolina University

At the beginning of the 21st century, Jamaica stands in a precarious situation which could have serious implications for the island's future. This stress may not arise from a decrease in precipitation due to climate change, but rather from the fact that smallholder farming has become increasing unsustainable. Younger Jamaicans have rejected farming as a career and instead opted for quick cash or migration out of the country in the hope of making their wealth elsewhere in the world. Thus, crop yields are at risk because fewer farmers working the fields. With decreasing labor rates and the current international economic crisis, the need for a high agricultural efficiency is greater than ever. Annual yields are also affected climatologically by a mid-summer atmospheric phenomenon called the Mid-summer drought (MSD), resulting in a bimodal rainy season in April-June, August-November. Understanding how rainfall affects crop production is a primary goal of this research. To accomplish this, a two part analysis will be conducted utilizing correlations between rainfall and crop yield and mapping employing Geographic Information Systems (GIS).

Comparison of moisture content between two landfalling hurricanes

Peng Jia

Corene Matyas

University of Florida

When assessing the rainfall potential of hurricanes, it is important to characterize atmospheric moisture both within the storm and in the environment surrounding the storm. This study utilizes precipitable water (PWAT) to infer rainfall potential for two hurricanes landfalling during September, 2004. We defined the storm environment by utilizing the largest radius of gale-force winds among the four quadrants to create a buffer around the storm center every six hours for a three-day period, then calculated statistics for PWAT values within this region and for a region twice this distance to sample the environment outside of the storm. Although the maximum PWAT values were similar, the average and minimum values were lower for Jeanne than Frances. An examination of PWAT values in the environment surrounding the storm shows that the environment surrounding Frances contained more moisture than for Jeanne. A Mann-Whitney U test confirmed that these results were statistically significant. Therefore, in addition to its faster forward speed, the reduced moisture content along the periphery of the storm and in the larger environment surrounding the storm contributed to the lower rainfall totals produced by Jeanne.

Unsupervised image segmentation evaluation and refinement using a multi-scale approach

Brian Johnson

Florida Atlantic University

In this study, a multi-scale approach is used to improve the segmentation of a high-resolution (30 cm) color infrared aerial photo of a residential area. First, 25 single-scale segmentations are performed in Definiens Professional 5 using different image segmentation "scale parameters". The optimal single-scale segmentation is identified using an unsupervised evaluation method of segmentation quality that takes into account global intra-segment and inter-segment heterogeneity measures (weighted variance and Moran's I, respectively). Once the optimal single-scale segmentation is determined, under-segmented and over-segmented regions in this segmentation are identified using local heterogeneity measures (variance and Local Moran's I). The under- and over-segmented regions are refined by (1) further segmenting under-segmented regions at finer scales, and (2) merging over-segmented regions with spectrally similar neighbors. This process leads to the creation of several three-scale segmentations. Comparison of single- and multi-scale segmentations shows that identifying and refining under- and over-segmented regions using local statistics can improve global segmentation results.

U.S. Efforts Contribute to Geospatial Science and Sustainable Development in Africa

Jason Jones

Jerry Griffith

The University of Southern Mississippi

With funding from NASA, the My Community, Our Earth (MyCOE) Program and the SERVIR Program formed a partnership to engage with twelve teams of students and their mentors from nine African countries to conduct long-term biodiversity research projects utilizing geographic information and technology. Through additional support from the National Science Foundation's Office of International Science and Engineering, the AAG selected three U.S. students to support these MyCOE / SERVIR biodiversity research activities. Selected as one of these students, Jason Jones spent three months in Africa supporting EIS-AFRICA, the longest serving organization championing the use of geospatial technologies for sustainable development in Africa. The State Department Bureau of Oceans, International Environmental and Scientific Affairs, EIS-AFRICA, and the AAG are working to develop institutional capacity at universities and NGOs in Africa and to provide training, data, and commercial high resolution multispectral satellite imagery to them at no cost. In 2009, the partnership launched a pilot project toward this end in Uganda, Namibia, and Burkina Faso. This is being carried out as part of the U.S. Department of State's Global Dialogues on Emerging Science and Technology (GDEST) initiative led by the Office of the Science and Technology Adviser to the Secretary of State. The program is continuing into 2011, and imagery requests from several African institutions are now being considered.

Exploring the Social and Physical Determinants of Cancer Risk in Galena Park, Texas, through Comparative Spatial Analysis in a GIS Environment

Demetrice Jordan

Georgia State University

The disparities that occur in many health outcomes are often directly related to the social and physical determinants of health, such as racial/ethnic characteristics, income, and a person's physical environment. The community of Galena Park, Texas, located along the Houston Ship Channel, consists of Hispanics and African-American residents with undocumented concerns related to air quality, healthcare access, and the built environment. This project seeks to visualize social and physical determinants of health that shape the health outcomes of Galena Park residents. This includes mapping the extent of poverty and residential segregation, highlighting the spatial accessibility of residents to hospitals and supermarkets, and identifying the risk of exposure to Benzene pollution for residents of the area.

Glacial Lake Expansion in the Himalayas: Remote Sensing Measurements of Imja Glacial Lake in Nepal

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Mississippi State University

Recent glacier recessions in the Himalayas have been linked to the development and expansion of glacial lakes. The Imja Glacial Lake in Nepal is increasing in area and volume, through calving of the glacier surface. The weak dams of the lake are in danger of causing Glacial Lake Outburst Flood (GLOF) which could affect the local livelihoods and destroy infrastructure and resources. In this research, changes in area of glacial Lake Imja in the last 35 years using Landsat satellite images have been measured. The results indicated that the lake has expanded from 0.286 sq. km in 1975 to 1.053 sq. km in 2010- 268% increase. Although the area of the lake increased continuously, the rate of expansion varied over the study period. Repeat measurements of the lake are necessary as the potential GLOF from this lake could threaten the safety of local people and the trekkers visiting the base camp of the Mt. Everest.

Xe Om Cho Tay: Motorbike Guides and the Creation of a Cultural Tourism Product in Transitional Vietnam

Rusty Kirby

University of Tennessee

Economic transition in Vietnam, from a command economy to market socialism, has encouraged a broad range of new economic activity. The tourism industry provides a useful lens to study this economic novelty. The growth of tourism is both an indicator of the increasingly liberalized and global economy in Vietnam as well as a case study of the economic and cultural encounter that tourism represents. The author undertook a two-month study of motorbike guides, using qualitative methods to discern the business practices of these small-scale entrepreneurs. The study reveals a broad range of formal and informal enterprises, alternately characterized by competition and cooperation between actors. The informants' concerns reflect the difficulty of building adequate institutions that guide structural transition. Finally, the study found that the most successful guides were those who most effectively adapted to changing consumption patterns of foreign tourists through the creation of a cultural tourism product.

The societal impacts of inland-moving tropical cyclones across the southeastern U.S

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It is well known that tropical cyclones cause significant impacts in coastal communities. Occasionally, these tropical cyclones, by virtue of their strength, size, or direction of movement, produce damage far inland from the coast. In this study, we develop a climatology of tropical cyclones that focuses on the inland societal impacts associated with the attendant high winds, heavy precipitation, and tornadoes. Twenty-four tropical storms making landfall between 1985 and 2007 are studied through reports of societal impacts and analyses of hourly weather observations. Selected newspapers in the region as well as the National Climatic Data Center's Storm Events database are examined to identify the societal impacts. These impacts include deaths, injuries, power outages, financial damages, damage to infrastructure, environmental/agricultural damages, and cancellations. Additionally, summaries published by the National Hurricane Center (NHC) are scanned to identify the maximum wind gusts and rain totals. Geographic Information System software is employed to characterize the wind fields and impacts relative to the storm center, track, landfall point, and coastline. Preliminary work suggests that societal impacts are greatest with large, strong tropical cyclones whose right forward quadrant tracks inland over major metropolitan areas.

Storage of Mining Sediment in Floodplain Deposits of the Big River, Missouri

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The Old Lead Belt is a historic lead (Pb) and zinc (Zn) mining district in southeastern Missouri that was a major producer of Pb worldwide from 1864 to 1972. Past and ongoing releases of tailings to the Big River have resulted in the large-scale contamination of channel sediment and floodplain deposits with toxic levels of Pb along 90 miles of the Big River. The purpose of this paper is to quantify patterns of storage of sediment contaminated by lead mining in floodplain deposits of the Big River. Overbank floodplain deposits are contaminated above the residential soil probable effects concentration (PEC) of 400 ppm Pb along the entire length of the river below Leadwood to a depth of 1 to 4 meters or more, with the highest concentrations exceeding 12,000 ppm. About 86,800,000 m^3 of contaminated sediment and 226,000 Mg of Pb remains stored in floodplain deposits along the Big River. Of the total amount of contaminated sediment stored in the channel-floodplain system, we estimate that 88% resides in floodplain deposits.

Spatial Analysis and Composition of an Isolated Urban Forest Remnant in Kennesaw, Georgia

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The purpose of this research was to determine the composition and structure of a forest fragmented by (sub)urbanization. The study was conducted in ten by ten meter plots within a 0.025ha permanent plot located in Kennesaw, Georgia. All species above 1cm dbh were identified and measured (DBH), and x, y location within the plot recorded. Data was then put into a GIS and mapped. Results show that the forest was predominately pine (Pinus taeda) and oak/hickory (Quercus/Carya spp.) in the canopy, with beech (Fagus grandifolia) in the understory. This research helps us to determine the composition and structure of the study site from which we can infer the stage of succession as well as the health and survivorship of a particular species or the stand as a whole. Furthermore, the data allows for the possibility of additional university wide, multidisciplinary field work and research experiences for a variety of degree-seeking majors (geography, biology, biostatistics, GIS, science education, etc.), including the creation of a campus map of the tree species and their biogeographic origins.

Construction and Expansion of Natural Gas Pipeline Corridors: Gulf of Mexico

Candis Mallett

University of Southern Mississippi

Natural gas is derived from plant and animal remains from about 200-400 million years ago that have compacted under sedimentary layers of the Earth (U. S. Energy Information Association, 2010). Natural gas is considered a fossil fuel (because it is derived from fossilized plant and animal remains), and natural gas is a non-renewable energy source; however, less emissions come from natural gas when processed as compared to other non-renewable energy sources such as coal. Natural gas producing states are from most producing to least producing as follows: Texas, Wyoming, Oklahoma, New Mexico, and Louisiana (U.S. Energy Information Association, 2010). Large amounts of natural gas are also found under the ocean floor. One of the newest drilling locations is the Gulf of Mexico. Interest has shifted from off the Texas coast eastward to the coasts of Louisiana and Mississippi. Through extensive research and development in the Gulf of Mexico region, large gas deposits are suspected and several have been developed (Rothfarb, 1970). Pipelines have been constructed to bring the off-shore gas onto on-shore processing plants that are in constant need of repair and maintenance. Expansion of this network will be necessary as future developments increase in the Gulf of Mexico region.

Identifying future gas fields is of importance to our energy needs. Radar can help identify gas fields. Radar waves are sent out from the bottom of ships to the ocean floor. These radar waves bounce back to the ship carrying with them geologic data that is used to identify areas of potential gas reservoirs (Mouawad, 2010). Gas rigs are then strategically placed for maximum production. Natural gas is pumped from the Earth and is typically shipped to processing plants through pipelines (Rothfarb, 1970). Natural gas is a naturally occurring fossil fuel that can be used for human use. Pipelines are the infrastructure making it possible to supply America with natural gas as a fuel. The oldest pipelines in America are almost 100 years old. Safety precautions must be followed to keep natural gas flow contained within a framework of pipes without incident. Replacement pipes are also important for keeping a contained gas flow within the intended network. While companies continue off-shore drilling in the Gulf of Mexico, construction will occur on the off-shore pipelines. A continual upkeep is mandatory to prevent and stop leaks from the pipelines. Contamination of surrounding waters is at stake if safety measures are not followed. Natural gas production has steadily increased in the Gulf of Mexico's western waters and growth is now shifting eastward into Mississippi and Louisiana salt marshes. This poster will examine the current location of these pipelines and how the network has grown over time.

A preliminary analysis of the utility of tree-rings from Nyssa ogeche to reconstruct tupelo honey yield in northwest Florida

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The University of North Carolina at Greensboro

This preliminary study investigates correlations between tree-ring growth and tupelo honey production in northwest Florida. Tupelo honey is a commercially produced unifloral honey harvested in the southeastern United States. Honey production has reportedly declined during the past several decades and may be associated with unfavorable climatic conditions, yet this relationship remains unexplored. This study examines the potential to reconstruct Florida honey and has two research objectives: 1) Determine if radial growth of Nyssa ogeche trees crossdate; and 2) Determine if the strandardized N. ogeche tree-ring chronology is statistically correlated with Florida honey yield-per-hive. Of the 30 trees (60 cores) cored, 25 trees (35 cores) statistically crossdated in COFECHA and were retained in the chronology with an interseries correlation of 0.340 and a mean sensitivity of 0.408. The standardized N. ogehce tree-ring chronology significantly correlated ($r = 0.375$; $p = 0.002$; $n = 67$) with the Florida honey yield-per-hive chronology. These results indicate that N. ogeche tree-rings could be used to reconstruct and extend the Florida honey record by at least 67 years allowing beekeepers to examine the reported decline in tupelo honey in a historical context.

Immigration, Labor, and Economic Restructuring: Latino Sub-Group Settlement in North Carolina

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North Carolina has one of the highest Hispanic population growth rates in the country. In fact, the Hispanic population in North Carolina grew by 790 percent from 1990 to 2008, with a 1990 Hispanic population of 76,726 and an estimated 682,516 persons of Hispanic origin in 2008 (U.S. Bureau of the Census). Given this high growth rate, it is not surprising to find several Hispanic Hypergrowth cities – metro areas with Latino population growth of over 300 percent from 1980 to 2000 – and new immigrant gateways located within North Carolina. With Charlotte's role in recent years as a restructuring, post-industrial key player in the financial industry, and Raleigh-Durham-Chapel Hill's transition to a knowledge-based economy, all of which rely on a large service sector, there is a need for further study of the relationship between the rapidly growing Hispanic population and the state's changing economy. This project focuses on the state of North Carolina through the following questions: (1) Are Latino immigrants from particular points of origin settling in specific areas of North Carolina and, if so, where are these specific groups coming from and where are they moving to? and (2) What are the causal mechanisms and pull factors that have attracted Latino migrants to North Carolina since 1990?

The Influence of Landscape on the Location of Deer-vehicle Collisions in Two Counties in South-central Mississippi

Jake McKee

Jerry Griffith

The University of Southern Mississippi

Annually, in the United States, the number of deer killed by vehicle collisions exceeds the number of deer killed annually through the effects of hunting. Deer-vehicle collisions (DVCs) have vast negative impact on the economy, traffic safety, and the general well being of otherwise healthy deer. For the purpose of mitigating DVCs it is imperative that we gain a better understanding of the factors which influence the locations of DVCs. However, research has concluded that these factors vary dependent upon the site or the region being studied. Moreover, very little research pertaining to DVCs has occurred in the southern United States. More importantly, to this date, there has been no research conducted related to DVCs which are focused at the county level scale within the south. Through the use of GIS, remotely sensed imagery, and statistical analysis, this research purports to evaluate the factors which contribute to the spatial distribution of DVCs within Forrest County and Lamar County, Mississippi.

Using Vulnerability and Planning to Measure Sustainability in Three North Carolina Coastal Communities

Gary Monitz

East Carolina University

Along the coast of North Carolina, development has put tremendous stress on already delicate natural systems. Consisting almost entirely of barrier islands, this region is highly dynamic and subject to a variety of acute and chronic natural hazards. In order to continue to enjoy these areas for recreation and reap the economic benefits that they bring, it will be essential to strike a balance between human activity and nature. This can only be accomplished through effective planning and coastal management. It is argued here that sustainable coastal communities result from the combination of relatively low natural vulnerability as well as planning and management strategies aimed at effectively adapting to different types of hazards. Taking both vulnerability and planning into account, a preliminary sustainability index has been devised and is used to compare three different communities along the North Carolina coast. The results suggest that traditional mitigation strategies are insufficient and that more adaptive approaches will be necessary to sustain these communities.

Panopticon Revisited: Gated Public Housing and Crime Reduction

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Donna H. Park

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This research looks at the impact of gating on public housing communities and the effect on the level of crime prevention/crime deterrence. We explore the probability that gating of public housing differs decidedly from gating of more affluent communities. We propose that gates in public housing communities have little or no positive impact on crime in the area. The aspects explored in this research are crime over a period of time and the difference in the level of crime before and after the gates were erected. We are looking at crime data and compiling a database of the crime statistics from two Gadsden, AL public housing communities, Gateway Village, formerly known by local residents as "Murderwood Homes", and Campbell Court. While there are a variety of associated considerations, the main foci for this project is whether gating actually deters crime or displaces it into nearby communities.

Poverty, Inequality, and Rainfall Patterns in Mozambique

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Abstract: One-third of Mozambicans live in rural communities, with 80% dependent upon small-scale and subsistence agriculture. If climactic trends persist in Southern Africa, annual rainfall may become more erratic and is projected to decrease as much as 9%. This poses a major threat to the majority of cropland lacking reliable irrigation and ultimately to food security and sustainable development. This study predicted that poverty and inequality across Mozambique are inversely correlated to rainfall. This hypothesis is based on forecasted impacts of changing climate on an agriculturally-based economy. Indicators assessed include mean annual income, generalized entropy, the Gini coefficient and the Foster Greer Thorbecke measure. Precipitation trends throughout the months of the growing season (represented by October, January, and April) were tested against socio-economic survey data of individual villages. Proximity of villages to roads and rivers as well as elevation were also examined as potential drivers. While it was found that increased rainfall was associated with lower inequality, a positive correlation was observed between rainfall and the proportion of the population living below the poverty line. The data suggests that while averaged precipitation is an important contributor to economic trends in Mozambique, other variables prove more influential.

Relating Socio-Economic Indicators to Landcover Patterns in Georgia's Lake Country

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Socio-economic indicators have been used successfully to describe successful economic and educational developmental strategies, however the underlying causes of these indicators may include past choices concerning land development and economic activity. In Middle Georgia's Lake Country, a collection of nine counties along the Oconee River, we found a strong relationship between socio-economic indicators and landcover. In particular, counties with a large percentage of forest cover had lower population growth, lower per capita income, higher unemployment, and below average graduation rates. We speculate that historical decisions to heal the demise of cotton agriculture and the Great Depression through vast pine plantations may have prolonged substantial recovery. Counties with the highest population growth, income levels, and educational attainment had less forest cover, and the remaining forest was held in smaller patches with more patches per unit area. This preliminary investigation encourages further study into the causes of economic and educational attainment in Georgia's rural counties and the expression of that development on the landscape.

A Tourism Climatology of the Southeastern United States

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Tourism climatology addresses how weather and climate can inform the decision-making process of tourists and businesses that cater to tourists. Most of the research in tourism climatology has been conducted in Europe; however this small field is gaining momentum in the United States. In this study, a user-friendly engagement tool is developed to promote some benefits of the field.

This Tourism Climatology involves the tailoring of climate data to the needs of a given population—in this case recreational tourists. The goal is to graphically illustrate the climate an outdoor tourist would likely experience when vacationing in a certain locale. Hourly weather data are obtained from 2000 and 2009 and the hours between 0900 and 1800 LST are excerpted for analysis.

Results are graphically displayed and tailored for varying levels of specificity needed in decision-making. Graphs include site-specific climatologies and state-wide comparisons. Generalized observations are provided and speak to seasonal and diurnal trends observed in regions of the southeast.

Distribution and abundance of riparian and in-stream large woody debris in late sucessional, hardwood forests on the Cumberland Plateau, Alabama

Rebekah Pine

Justin Hart

University of Alabama

The purpose of this research is to examine the distribution and composition of large woody debris (LWD) in a southern Appalachian landscape. Particularly, this research focuses on terrestrial and in-stream large-woody debris in late successional, mixed hardwood forests and adjacent stream systems. The distribution and composition of LWD is influential to in-stream processes and characteristics such as in-stream habitat, channel morphology, nutrient cycling, and sediment storage. Terrestrial LWD provides habitat for a wide range of plants and animals and is also a major nutrient sink and reservoir. The importance of LWD on forest dynamics is becoming increasing recognized but there is still a major gap in understanding how terrestrial LWD and aquatic LWD are coupled. LWD that recruits into streams from adjacent forests is key to understanding the link between riparian habitats and stream ecosystems. The number of pieces in the riparian zones was 373.3 ha^{-1} and the volume was 141.96 m^3 ha^{-1}. The total number of in-stream pieces was 20.0 100 m^{-1} and the volume was 0.074 m^3m^{-1}. The volume of LWD was within typical range for other complex southern Appalachian forests but the frequency was low.

Protecting Karst Systems and Groundwater in Rural China through Science and Education

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Through a grant awarded by the US Agency for International Development to the Vermont Law School and the Woodrow Wilson International Center for Scholars, Chinese and American scientists from the International Research Center on Karst (IRCK) and the Hoffman Environmental Research Institute (HERI) at Western Kentucky University (WKU), respectively, held an environmental justice workshop related to public karst groundwater concerns in rural Wuming County, Nanning City, Guangxi Autonomous Region, China. This location was selected based on growing concerns about Ling Shui Spring, the sole water source for the over 100,000 residents currently residing there. Ling Shui Spring water quality and quantity have undergone deterioration in the past thirty years, with growing population concerns further threatening the water supply. A training and educational workshop was held in Wuming County to an audience of over 200 people, including presentations by US and Chinese scientists on protecting karst systems and groundwater through science, education, and relevant laws. Outcomes include enhancements between US-China University relations, and a proposal on protection of Ling Shui water resources by Wuming County political consultative conference and IRCK to set up water resource protection areas, stricter control of groundwater use, and further outreach and education activities.

Survey of economic resiliency of six Mississippi counties and four Louisiana parishes affected by Hurricane Katrina.

Kit Posadas

Mississippi State University

Six counties in Mississippi and four parishes in Louisiana were examined for their economic resiliency five years after Hurricane Katrina. Through eight socioeconomic variables, their status in the five years before the hurricane were compared with the years following the hurricane. The total population, the median household income, the gross sales, the sales tax collection, the number of business establishments, the annual payroll, and the number of paid employees changed significantly for most of the counties and parishes. The number of new private building permits did not change significantly, though it is clear there was a short housing boom after Hurricane Katrina. From the variables that showed significant increases, the demographics of the population for the six counties and parishes can be inferred to shift upwards in wealth.

"Questioning the 'Cone of Uncertainty': Proposing Alternate Hurricane Warning Graphics"

Laura Radford

University of Alabama

Hurricane warning communication has become a recent topic of debate among academics, emergency managers, and meteorologists. The current graphic used to portray vital information to people in the path of a hurricane is the "Cone of Uncertainty," which is produced by the NHC and modified by local TV stations. Evidence suggests this graphic creates too much ambiguity, which can lead the public to incorrectly interpret its meaning. In order to achieve warning clarity, we must understand the many possible ways people are obtaining information from this graphic. In this research, ArcGis 9.3 and PowerPoint were used to create alternative hurricane warning graphics. Using these alternative graphics, citizens in Jacksonville, FL and Pensacola, FL were surveyed to ascertain which graphic each citizen preferred. These two locations were chosen to represent two demographically similar coastal communities with different hurricane strike regimes; Jacksonville, FL no significant impacts in over 100 years and Pensacola, FL many direct impacts.

SIGNS OF THE TIMES: LIQUOR LAW CHANGES IN GRANT COUNTY, KY

Kevin Raleigh

University of Cincinnati

Each of Kentucky's 120 counties possesses the option to introduce local referenda regarding alcohol sale, prohibition or consumption, and electoral alcohol referenda history for each of Kentucky's counties highlights similarities and differences from county to county. Grant County, Kentucky, long associated as rural, has in recent years seen an upsurge in growth, population change and new home and business construction, and now is often included as part of the Greater Cincinnati urban area. This poster examines alcohol referenda changes in Grant County, and it considers what relationships exist between county alcohol status, changing times, changing cultural mores, and population. Many Kentucky counties are dry, commonly cited as existing due to religious influence. While current geographical and sociological examinations suggest that wet counties are more likely to be urban, higher in population and wealthier, the examination of changing liquor laws in Grant County is insightful as it presently is undergoing a population increase and a rural-to-urban transition, not only by Census records and media broadcast areas, but also in perceptions and attitudes.

Ecogeomorphology of a trailing ridge at Doña Juana, Veracruz, Mexico,

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Within transgressive dunefields, trailing ridges may be formed at the lateral margins of transverse dunes as vegetation colonizes interdune areas. This research examines interactions between dune geomorphology and vegetation community dynamics at different stages in development of trailing ridges. The topography of a trailing ridge in the Doña Juana dunefield in Veracruz, Mexico, was measured along the main axis of the ridge as well as 7 transects which were perpendicular to the main axis of the ridge. Percent cover of 9 plant species and of dead vegetation was estimated continuously along these transects in 0.5m by 0.5m plots. There was a significant change in morphology along the ridge, with a more peaked older portion and the younger, downwind portion more rounded. A spatial analysis of plant presence and distribution revealed that there was less plant cover and lower species richness in the downwind and windward portions of the ridge, where environmental stresses are relatively higher. A model for the formation and evolution of a trailing ridge is created based on observed relationships between dune geomorphology and ecology.

Spatial Analyses of a Noxious Invasive Specie in The Bahamas: A three year study of casuarinas populations on San Salvador Island.

John Rodgers

Mississippi State University

This study investigated the spatial distribution of the noxious, invasive casuarinas (Casuarina equisetifolia) on beaches of San Salvador Island, The Bahamas over a three year period. Transects at four beach locations were established, and the location of casuarinas were recorded with a Garmin Etrex GPS. Heights of individual of casuarinas were also recorded. Sampling occurred during January 2007, December 2007, January 2009, and June 2009. Casuarinas data were imported into a GIS, and the spatial autocorrelation was tested. Polygon layers of casuarinas cluster were generated by buffering individual point locations by 15 meters and then aggregating contiguous buffers. The results show significant spatial autocorrelation of casuarinas for all study sites with regards to height. Clusters of casuarinas did not change appreciably in number, area, or density over the study period as a whole, but subtle differences among field seasons were apparent. Cluster median heights, however, significantly increased ($P<0.01$) during the study period. Seedlings, individuals $\leq$ 100 cm, were preferentially found within previously-established clusters. These results help shed light on the spatial patterns of this problematic invasive specie for which very little is known. They also provide insight into establishing effective management procedures to contain future spread.

Impacts of Land-use and Land Cover Change on Eastern Kentucky Flash Floods

William Rodgers

Rezaul Mahmood

Western Kentucky University

Eastern Kentucky is a 35 county region that is a part of the Cumberland Plateau of the Appalachian Mountains. With mountaintop removal and associated land-use/land cover change (LULCC) (primarily deforestation), it is hypothesized that with a decrease of root depth, there would be a decrease in the reintroduction of the soil moisture in the atmosphere through evapotranspiration. The decrease in the average atmospheric moisture content would allow for larger diurnal temperature range and possibly decrease non-forced convection. With a decrease in the convection, there would be less precipitation. Yet due to the lack of vegetation cover, there would be less infiltration of rain into the soil and more runoff. With the increase of runoff, there would be an increased probability of a flash flood event. In this research, we have conducted sensitivity tests of atmospheric response of a significant flash flood producing rainfall event by modifying land use land cover (LULC) and topography. These reflect recent LULCC including mountaintop removal. We have used Weather Research and Forecast (WRF) model for this purpose. The study found changes in amount, location, and timing of precipitation. LULCC also modified various surface fluxes, moist static energy, planetary boundary layer height, and local-scale circulation wind circulation.

Effects of Irrigation on the Streamflow of the Lower Flint River, GA

Jason Saldarriaga

University of Florida

Water resources of the Lower Flint River, in southeast Georgia, are under increased stress as more water is consumed by agricultural irrigation. Studies during the 1990's indicated the possibility that the river's flow could cease during extended droughts, worrying both the farmers in southern Georgia, and Floridians downstream, who rely on the water. Trends in mean annual and annual daily minimum flows at three gage sites along the Lower Flint River Basin are analyzed for declining trends in flows within, and over, the entire contemporary period (1957-2008) using Mann-Kendall and hypergeometric probability distribution tests. The significant downward trends correspond to the dramatic intensification of the use of center-pivot irrigation during this period and accounts for the majority of water consumed in the basin. However, growth in irrigated acreage does not follow a simple monotonic increase, with most growth occurring between 1974 and 1978. Mann-Kendall and hypergeometric probability tests on pre-irrigation (1957-1973) and post-irrigation (1979-2008) flow levels demonstrated divergent trends between the two periods, along with a slight increase in inter-annual variability of flows. These results stress the importance of understanding the Flint River's declining flow patterns for both the region's economy and the river's biota, which includes several endangered species.

Capillary Flow Dynamics above an Oscillating Water Table: Influence on Surface Moisture Content Evolution

Phillip P. Schmutz

Louisiana State University

Within the beach environment the groundwater system is strongly influenced by tidal oscillations, which generate cyclic fluctuations in the elevation of the water table. These fluctuations can in turn play a crucial role in regulating capillary water flow dynamics and ultimately the evolution of beach surface moisture. Although several recent studies have examined capillary water movement above a fluctuating water table, few studies have taken the next step and explored the contribution of capillary flow dynamics to spatial and temporal variability in beach surface moisture content. This study will address this issue through a series of laboratory experiments designed to document and model capillary flow dynamics above an oscillating water table and its influence on surface moisture content. The laboratory settings utilize a column of fine-grained sand placed into a tank of water. Water levels are raised and lowered to mimic tidally-induced fluctuations of the water table and the resulting changes in moisture levels within the sediment column are measured using Delta-T probes place at various elevation increments. Results illustrate that water content is increasingly dampened and shifted in time with distance from the upper boundary of the water table.

Urban Heat Islands Mitigation Strategies and the Benefits of Urban Heat Island Mitigation

Satira Staley

University of Southern Mississippi

The human population is experiencing a modification from rural to urban. Urban area expansion is increasing at a rapid rate. During the last 50 years, the increase in Earth's population living in cities is up 30% (Silva, et al. 2008). By 2030, an expected 5 billion people will settle in cities, having a profound effect on the environment (Silva, et al. 2008). When world trends progress from rural to urban, the realization of land use changes is apparent. The consequences of change in cities are changes from forested permeable surfaces to paved impermeable surfaces. The rural to urban alteration is a catalyst to constant physical change in the urban environment. Changes in land use produce a rise in temperature greater than the temperature surrounding the city. This phenomenon is called an urban heat island (UHI). UHI's are typically evident in most metropolitan cities where the temperature can rise as much as 5.4^{o}F greater than the region surrounding the city (EPA, Urban Heat Island Basics 2008). In addition to causing a rise in temperatures, UHI's also contribute to pollution, escalating health risks, and energy consumption. UHI's have surface and air temperatures that are higher than the temperatures of the surrounding area. Surface temperatures in urban cities are as high as 50 degrees higher than the air temperature of the city. As the temperatures in cities rise, energy consumption increases. The state of California had to enforce mandatory black outs in the summer months of 2001, because of a deficiency of energy for the entire state. Mitigation strategies can assist city planners to make decisions on how to reduce rising temperatures from UHI's in urban cities. Mitigation for air temperatures are important for the reductions of pollution, health risk, heat related deaths, illnesses, and rising ambient temperatures. The mitigation practices of reforestation, cool roofs, green roofs, cool credits, and cool pavements are current technologies that will help reduce a rise in temperatures of urban areas. Reforestation helps remove harmful pollutants in the air. Reforestation provides trees that provide shade to cool people and surface areas. Trees provide a cooling affect by evapotranspiration. Cool roofs will help to reduce surface temperature by providing surface materials with a high albedo. Cool roofs will absorb less solar energy and reflect more solar energy, which will reduce surface materials ability to store heat. Green roofs will provide some of the same benefits as cool roofs, but with added benefits. Filtering pollutants from the air and cooling the air through evapotransporation. Cool credits provide incentives to customers who use these cool roofs as a mitigation strategy for higher energy usage areas. Mitigations for UHI's are important for urban cities and the environment.

The Evolution of Blues Culture: A Sense of Place and Space in the Mississippi Delta

John Strait

Sam Houston State University

This research endeavor explores the "sense of place" associated with the evolution of "blues culture" across the Mississippi Delta. By focusing on blues *culture*, rather than simply blues music itself, this project provides a forum for understanding the broader geographical, historical and social conditions from which this musical form emerged and within which it still thrives. The research borrows from and informs teaching modules that utilize place-based methodologies and musical expression as lenses to understand the complex cultural contexts that make the Delta both unique and significant (Strait 2009, 2010). These modules emphasize a geographical perspective and incorporate the "pedagogy of place" – the notion that traditional learning can be greatly enhanced when specific localities or "places" are utilized as primary resources or "texts" (Gruenwald 2003; Gruenwald and Smith 2007; Smith 2007). The "poetics of place" – stories from the past and present that are encapsulated in particular spaces and places – are used to understand the culture of the region.

Geographers are increasingly utilizing music as a way to investigate the concept of "place" (Riback 2004; Strait 2010a, 2010b, 2010c). Various forms of music have also long been linked to a wide variety of social and environmental movements (Smith 1997; Eyerman and Jamison 1998). It would seem logical that scholars could easily use music themes and forms as a way to comprehend the ways in which cultural or social groups interact with and perceive places and spaces. Few places are as strongly linked to a distinct music heritage as the Mississippi Delta. Moreover, the music that is associated with and derived from this region promotes an exceptionally vivid sense of place. For example, the area is geographically acknowledged as the birthplace of both blues and rock 'n' roll" and is the source of a variety of other uniquely American art forms. This region, perhaps more than any other, strongly exhibits the complex social, economic and cultural relations historically linked to the "Plantation South." In a short amount of time this region witnessed a total transformation of its agricultural economy. Linked to this economic transformation is the fact that the Delta functioned as the staging ground for the Great Northern migration, a geographic process that not only changed the South, but also changed the entire country. In addition, this region served as the backdrop for a number of events and initiatives that were critical to the Civil Rights Movement, such as the Freedom Summer of 1964. In the context of this research project, "blues culture" is viewed as a cultural response to the following phenomena: racial segregation, economic transformations, social and technological change, civil rights, demographic change, gender relations, migration and heritage tourism. In using the concept of blues culture as a means to comprehend linkages between these various processes, and by analyzing the cultural landscape as "text," this research examines various ways in which the Mississippi Delta has both transformed and been transformed by the wider world.

Portraits for Young Americans: Teaching Geography with Lois Lenski's Regional Novels

Jamie L. Strickland

UNC Charlotte

Between 1943 and 1968, popular children's author and illustrator Lois Lenski wrote seventeen novels about the circumstances of young people in various states and regions in the United States. Lenski's sensitive, well-researched portrayals of life in specific regions of the country were designed to "introduce" little known people and places to children everywhere. These books provide a unique opportunity to link the essential elements of geography to social studies curricula. This poster explores illustrative examples from four of Lenski's regional novels and connects central geographic concepts to competency goals for fifth grade social studies.

USING TOO MUCH WATER? MAPPING LAWN WATER USE AND LAWN IRRIGATION PRACTICES: WELLINGTON, FL

Felicia D. Survis

Florida Atlantic University

This study examines lawn water use in residential Wellington, Florida with the purpose of 1) estimating the typical amount of water used for lawn irrigation, 2) estimating the irrigable lawn area cover (lawnscape) to extrapolate lawn water use over the study area .
Estimates of lawn water use typically are derived from public water supply records that do not take into account the water that comes from un-metered private wells or canals and therefore may under-represent the quantity of water devoted to lawn irrigation. More accurate estimates of lawn water use are critical for developing conservation methods that translate into a reduction in water use. Two methods of classifying lawnscape area were combined with estimates of lawn water use to estimate lawn water use by study area lawns.
Study subjects used an average 9.5 gallons per square foot over the study period, applying an average of 15.3 inches of water for every square foot of lawnspace. Combined with precipitation, this equates to 46 inches for every square foot of lawnspace, roughly 2.3 times what was needed to keep the lawn green. Most residents over-water their lawns even when they comply with watering restrictions and respond to variations in precipitation.

Bibb City, Georgia: Interpretative Strategies for a Mill Village Cultural Landscape

Robert Thomas

Amanda Rees

Columbus State University

In October 2008 one of the largest cotton mills in the American South burned to the ground. Located amidst the village of Bibb City this massive building was surrounded by 200 company-built homes and community buildings making it a unique cultural landscape. Surrounded by Columbus, Georgia, this community faced the fire's devastation with grief, remembrance, and concern for the future. In our Maymester cultural landscapes class (2009) we joined the Department of Theatre to devise various interpretive strategies to tell the Bibb City story. Using Tilden's (2007) interpretive principles this poster analyzes where we met the goals of effective interpretation by analyzing methods and strategies including: the exhibition and children's exhibition guide, a community self-guided tour accompanied by an audio podcast, "in character" walking tours, an oral history performance, and a website publishing our work. By applying spatial thinking to field-based cultural landscape analysis, introducing interpretive strategies into cultural landscape study, and developing writing strategies engaging a general audience, we interpreted this unique cultural landscape to over 340 participants.

Pathogens Today, Pandemics Tomorrow: A Modern Study of Disease Diffusion

Clint Thompson

Valdosta State University

This poster illustrates the topic of disease diffusion, focusing on the factors which affect how a disease spreads throughout populations. 7 control factors, identified through my research, are presented, as well relevant maps and charts.

Urbanization and its impacts on precipitation around three Urban Centers in the Kentucky-Ohio River Valley: An update

Ryan Torres

Joshua Durkee

Rezaul Mahmood

Kentucky Climate Center

It is well known that urbanization produces the urban heat island (UHI) effect which resulted in higher air temperatures compared to outlying rural areas. This effect has the potential to alter convection and enhance precipitation in areas downwind of large cities. This is due primarily to urban and industrial development. Tropical Rainfall Measurement Data (TRMM) was used to indentify possible precipitation enhancement in the Kentucky-Ohio River Valley. Three cities showed possible urban induced precipitation events. Initially, events were identified in the months of June, July, and August. Follow-on research used NCDC substations in and around the three cities to further analyze amounts of precipitation. Monthly and annual rainfall averaged totals were collected. The data spanned over 40+ years of station datasets. The data was graphed to show any possible trends. The graphs from these datasets showed that, on average, inner city stations received more precipitation annually and monthly over time than rural stations. Further research is being conducted to analyze the extent of urban-induced precipitation.

Sugaring in the Piedmont, North Carolina

William P. Tyminski

UNC at Greensboro

Jason T. Ortegren

University of West Florida

Maple syrup production primarily occurs in the northeastern and midwestern U.S., with smaller operations in some southern states. From 1860–1910, maple syrup and sugar were produced in large quantities in North Carolina, Tennessee, Virginia, and West Virginia. In 2007 Virginia, West Virginia, and North Carolina still maintained commercial production, albeit at much lower volumes compared to the 19th and early-20th centuries. Despite the decline in production throughout the Southeast, collecting maple sap is still feasible where sugar maples are found. The winters in the Piedmont region of North Carolina have on average 30.7 days of ideal meteorological conditions that would facilitate sap flow. These 30.7 days mainly occur during the months of January and February, and are limited by the second week of March.

Accumulation of Sediment in Manmade Lakes in Mobile, Alabama,

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Miriam L. Fearn

University of South Alabama

This research focuses on the determination of total sediment accumulation in five manmade lakes in Mobile, Alabama. Sedimentation affects water storage within a lake as well as recreational potential for the lake. In a rainy city like Mobile, transport of sediment is a major problem and the city's lakes can receive a large amount of sediment with every heavy rain. The lakes studied range in age from twenty to seventy years and in size from one to thirty acres. Two to six sediment cores were extracted from each lake during the summer of 2010. The highest sediment accumulation was 85 cm from McLean Lake, and the lowest was 23 cm from the Environmental Studies Center Lake. The maximum sediment accumulation rate calculated was 3.7 cm /year from the University of South Alabama Lake. The lowest sediment accumulation rate was 0.8 cm/year from the Environmental Studies Center. Sediment accumulation rates appear directly related to land use practices within the lake's watershed.

The Importance of Natural Teaching Areas and their Role in Florida's Higher Education System

Richard Way

Santa Fe College

According to a report on the President's Council on Physical Fitness and Sports (2007), two thirds of American children can't pass a basic physical and 40% show early signs of heart circulation problems. Child depression has increased over the last 20 years. The America Psychiatric Association (2009) estimates 8 million children suffer from mental disorders. Richard Louv, author of The Last Child in the Woods (2005), Tucker (2006) and Driessnack (2009) suggest childhood medical issues can be remedied by exposure to nature. This research investigates the role of higher education in addressing this problem. Florida public Universities and Colleges were polled on their provision of outdoor learning environments. Natural teaching areas are defined as being kept on their natural state and designed to exist as natural learning environments. It was necessary to obtain information from academic departments, facilities managers and administrators. A compendium of designated natural teaching areas and facilities was created for higher education institutions in Florida. This research produced a preliminary central repository of natural teaching areas and their uses. Florida institutions of higher education are incorporating nature within their curricula and several institutions have areas dedicated in perpetuity to provide access to nature.

Monitoring of Erosion on Hazel Run, Fredericksburg, VA

Zachary Wehrmann

University of Mary Washington

The purpose of this research was to initiate an assessment of the bank stability of Hazel Run. Hazel Run is a tributary that flows through much of the City of Fredericksburg before emptying in the Rappahannock River. Three sites were chosen for the study based on their location to current urban expansion such as residential and commercial development. This project was carried out by utilizing a digital theodolite and leveling rod to create transects at key points along Hazel Run. These transects track the migration of sediment as it is eroded and deposited along the banks. The findings indicated that with an increase in urbanization there is a direct decrease in permeable surfaces which results in increasing erosion along the banks of Hazel Run. This study will continue with basic land use analysis and the inclusion of water quality data from the same time period to come to an understanding of the consequences urbanization has on a river system.

Precipitation changes near Three Gorges Dam

Fang Zhao

University of Georgia

The effects of the Three Gorges Dam (TGD) Reservoir on environmental and societal factors are of increasing concern from various stakeholders. This research has three primary objectives. The first objective is to examine and quantify reservoir surface area changes in response to water level changes using Landsat and water level monitoring data. Results show an exponential relationship and that the reservoir expansion is a function of location due to bank characteristics. The second objective is to establish the viability of satellite-based precipitation estimates for examining TGD-regional rainfall impacts. Tropical Rainfall Measuring Mission (TRMM) rainfall rate data were verified spatio-temporally using daily data from 34 rain gauges within the 6-by-6 degree study area from 1998 to 2009. Cumulative daily rainfall and probability density functions (PDFs) were also compared. The results suggest that the TRMM-based estimate of precipitation is quite robust in this area. Built on these initial results, TRMM and MODIS precipitation and cloud data from 1998 to 2009 will be analyzed next to determine whether regional precipitation variability is altered by the TGD and its reservoir system. MERRA reanalysis data will be used to composite prevailing wind under abnormally "wet" and "dry" conditions.