30th Annual Louisiana Remote Sensing and GIS Workshop
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Abstracts

Oral Presentations

Session 1: Geospatial Technology and Analysis

ArcGIS JavaScript Plus Django Equals Dynamic Web App
Leslie H. Morgan, GIS Nuts

In geospatial blogs and on Twitter, 2014 has been hailed as the year JavaScript takes over the GIS world. JavaScript allows for rich user interfaces executed in the client's browser, but adding a web framework such as Django enables the development of truly dynamic web applications. Django is a Python-based open source web application framework. Esri's JavaScript applications can be deployed through Django, giving access to the Python language for generating web pages, Django's rich templating system that utilizes the concept of inheritance, and built-in security modules. This presentation will show how Django was used to implement user-based authentication and authorization for a web application employing the ArcGIS API for JavaScript. It will also show how Django facilitated the implementation of web application tasks such as exporting attribute tables to downloadable files and sending automatically generated emails to users.

Census Numbers to Local Government Funding – Census Apple seeds to Fruit Bearing Trees
Lynn Dupont, Regional Planning Commission

How GIS is used in Cooperative Multi-Level Government Analysis to Negotiate Urban Boundaries. These resulting boundaries permit the use of federal funding in local urbanized areas for planning studies and construction projects.

US Army Reserve Global GIS and Field Application Development
Kate Woods, Pond & Company

The federal budget crunch has yielded an increased need for highly accurate geospatial data in order to more efficiently manage and plan for federal assets. With this in mind, the US Army Reserve (USAR) has recently kicked off a global initiative to develop a comprehensive Common Installation Picture (CIP) GIS of site-level assets for over 1,000 facilities world-wide. The purpose of this initiative is to provide highly accurate, updatable GIS and building space data for facilities management and planning now and throughout the foreseeable future via integration with the US Army Mapper enterprise system. In addition to providing groundtruthed data from over 600 site visits throughout CONUS and OCONUS, the project also provides new standards for the acquisition and delivery of USAR spatial data, and has developed an interactive web map viewer for use in the management of field crews and project status by the contractor, client, and federal contracting office. The project not only leverages GIS for spatial data deliverable development, but also depends heavily on its use for analyzing, developing and managing logistics associated with daunting field tasks.

MRHDMS Data Delivery and Visualization on LCA.GOV
Christina Hunnicutt[1], Craig Conzelmann[1], Anthony Kuczynski[2]
[1]U.S. Geological Survey
[2]Five Rivers Services

The Mississippi River Hydrodynamic and Delta Management Study (MRHDMS) included a myriad of partners working together to collect, process, and analyze massive amounts of hydrological, biological, and physical data along the Mississippi River and its tributaries. A data management team was formed to help manage and apply long-term value to the collected data. The LCA website (www.lca.gov/Projects/22) is used as the primary data visualization and dissemination mechanism for the MRHDMS project. In support of the MRHDMS project, a new web map was

designed and implemented to support both new and legacy data existing within the project area. The mapping application was designed around the data standards developed by the MRHDMS data management team. Within the MRHDMS project, the commitment to data standards promoted a convenient spatial data discovery mechanism to move between web-enabled spatial data and corresponding raw data files. As MRHDMS priorities drive web-enabled data availability, applicable data types are being displayed on the web map after the data is transformed into a standards compliant form through a series of data management processes. The mapping application will ultimately contain references to all MRHDMS data such as water quality data, multibeam bathymetry contour data, acoustic Doppler current profiler (ADCP) observation points and transect data, and bottom-grab grain size data.

Session 2: Urban GIS

Development of a Multilevel Linear Referencing System (MLRS) for Baton Rouge, Louisiana
Justin Priola[1], Jason Carr[2]
[1]Baton Rouge City-Parish Planning Commission
[2]ARCADIS US, Inc.

The Baton Rouge City-Parish Planning Commission is responsible for managing road network data for East Baton Rouge Parish. In 2011-12, with assistance from consultants at ARCADIS US, Inc.the City-Parish implemented a linear referencing system (LRS) to rationalize the storage and use of its road data. Building on this effort, GIS Analysts embarked on a project in 2013 to develop a multi-level linear referencing system (MLRS). Using Intergraph® Corporation's GeoMedia® Transportation Manager software, the multi-level LRS addresses the need to support numerous geometric representations of a given road. This makes it possible for a single GIS Analyst to maintain road geometry and many related datasets. The development of an MLRS serves to improve and change City-Parish business practices to increase efficiency, interdepartmental coordination, and overall technical capability. Originally, road data was only used for creating base maps, but now it can store and dynamically display a wealth of event related information. This presentation will cover the background, process, and development of the MLRS, and the realized and projected benefits for the City-Parish.

Maps on the Desktop, Maps on the Move
Amy Brassieur, Iberia Parish Government

How do you supply map data on the desktop as well as on mobile devices? What if you have ArcGIS Server, but no software development staff for custom apps? What if you want to create once, then use on many devices? This presentation will describe how a one-person local government GIS department supplies map services with ArcGIS Explorer Desktop for end-users to create their own ad-hoc maps, and how ArcGIS Online for Organizations with the free Esri apps for iOS and Android deliver map products to mobile devices.

Using Aerial Imagery in 9-1-1 Centers
John Adams, Orleans Parish Communication District

Orthogonal and oblique aerial images are now finding their way into 9-1-1 centers. This imagery can provide unique assistance to help find the citizen caller and give Police/Fire/EMS important information about the location to which they are going. However, there are a number of challenges to the use of this data in time-sensitive situations. These include the accuracy of associated GIS layers, the ease/speed of using applicable software as well as visual, cognitive and linguistic factors involved with interpreting images and communicating information contained in them. The presentation will help agencies make the most of this resource.

Mapping Industrial and Demographic Transformation in US Metropolitan Areas
David Gladstone[1], Aimee Preau[2]
[1]The University of New Orleans
[2]Federal Emergency Management Agency

Orthogonal and oblique aerial images are now finding their way into 9-1-1 centers. This imagery can provide unique assistance to help find the citizen caller and give Police/Fire/EMS important information about the location to which they are going. However, there are a number of challenges to the use of this data in time-sensitive situations. These

include the accuracy of associated GIS layers, the ease/speed of using applicable software as well as visual, cognitive and linguistic factors involved with interpreting images and communicating information contained in them. The presentation will help agencies make the most of this resource.

Session 3: Coastal and Geologic Mapping

Creation of a 3-Meter Topobathymetric Elevation Model for Southern Louisiana Using Improved Elevation Masking Techniques

Jeffrey J. Danielson[1], Dean J. Tyler[1], Daniel M. Howard[2], John A. Barras[1], Gayla A. Evans[1], John C. Brock[1]
[1]U.S. Geological Survey
[2] Stinger Ghaffarian Technologies, Inc.

Since the 1930's, Southern Louisiana has experienced some of the highest rates of wetland loss in the United States. Because these wetlands provide a natural buffer against the impacts of storm events, the loss of the wetlands makes coastal communities and infrastructure more vulnerable to the risk of coastal flooding. Integrated high-resolution topobathymetric elevation data are required to model the impacts on sea level rise, storm surge, habitat changes, the numerical modeling of sediment resources, and transportation. Topobathymetric elevation models are an essential component to any application requiring detailed knowledge of the near-shore topography and bathymetry. The Coastal National Elevation Dataset (CoNED) is the integration of many disparate lidar and bathymetric data sources into a common dataset aligned both vertically and horizontally to common reference systems. CoNED is a multi-temporal, multi-scale, and multi-resolution dataset that permits easy portability to geomorphological and hazard vulnerability applications but at the same time extends the framework of the National Elevation Dataset (NED) into the littoral zone. A 3-meter topobathymetric elevation model was developed for Southern Louisiana by integrating dozens of high-resolution lidar and bathymetric surveys acquired by numerous collaborators. Improved geospatial techniques to mask the land/water interface from bare-earth lidar point cloud data using the LAS Dataset framework and raster elevation data based on hillshade thresholidng have been developed to improve data consistency by minimizing manual interpretation. The 3-meter integrated model will be available through the National Map (http://viewer.nationalmap.gov/viewer/) at a 1/9th arc-second spatial resolution.

Changes in distribution of common plant species in coastal Louisiana: 1997 - 2013

Jenneke M. Visser[1], Alexandrea Pasch[1], Charles E. Sasser[2]
[1]University of Louisiana at Lafayette
[2]Louisiana State University

We used data from the coastwide vegetation surveys (1997, 2001, 2007, and 2013) to document changes in distribution and cover for several common marsh species (Amaranthus australis, Avicennia germinans, Cladium mariscus, Distichlis spicata, Iva frutescens, Juncus roemerianus, Morrella cerifera, Panicum hemitomon, Paspalum vaginatum, Phragmites australis, Sagittaria lancifolia, Schoenoplectus americanus, Schoenoplectus californicus, Spartina alterniflora, Spartina patens, and Typha spp.). Maps showing the distribution of each species in each survey year were prepared as well as summary data (number of stations, average cover) that show trends in species occurrence. Changes in species occurrence and distribution over time will be summarized and potential explanations for these changes will be discussed.

An Introduction to the National Hydrography Dataset (NHD)

David Arnold, U.S. Geological Survey

The U.S. Geological Survey mapping program is making the transition from a historically based production model to the stewardship model. Strong partnerships with Federal, State, and Local partners are vital to the success of *The National Map*, and more specifically for the National Hydrography Dataset (NHD). The NHD is a seamless surface water dataset used for analysis, mapping, reporting and tracking of water data and issues. As with any geospatial dataset designed to capture the real world, changes are constantly occurring. Updating the NHD takes advantage of new imagery, LiDAR and other sources of information. Because of their familiarity with the landscape, local users of the NHD are in the best position to provide updates, maintenance and feedback about the NHD. The basic premise of the NHD provides for an easy-to-use, yet very powerful dataset designed around change management practices that ensure updates maintain the integrity of the data.. The stewardship organization, tools and processes used to make updates, and examples of stewardship in action are presented.

Mapping of Late Quaternary Paleovalleys on the Outer Continental Shelf Offshore Louisiana
Robert Paulsell, Paul V. Heinrich, Riley Milner, Richard P. McCulloh
Louisiana State University, Louisiana Geological Survey

Pleistocene continental glaciation has repeatedly lowered global sea levels as much as up to 120 m below present levels. Alternating lowstands and highstands resulted in the deposition of shelf-phase deltas on the offshore Louisiana continental shelf and the formation incision of valleys within them. Geomorphic Stratigraphic surfaces associated with these deltas and buried within paleovalleys might contain represent archaeological deposits preserved paleolandscapes with potential cultural that significance have survived postglacial sea-level rise. Fluvial sediments filling these paleovalleys are potential sources of sand for long-term coastal nourishment restoration projects. This project is sponsored by the U.S. Bureau of Ocean Energy Management (BOEM) and comprises the digital synthesis and compilation of legacy paleovalley mapping of paleovalleys spanning nearly 40 years. An integral part of the project has been the development of a Geographic Information Systems (GIS) for visual representation, analysis, and computational support. The core of the GIS work has been to develop digital data from raster geophysical maps that exist as Portable Document Format (PDF) files. Many different geologists and geophysicists prepared these interpretations since ca. 1975. The process of developing GIS data from legacy maps is detail-intensive. Initial steps were to determine which of the many maps contain information relevant to the study (e.g. ancient river valleys or paleovalleys). Raster images were georeferenced and digitized into a vector format resulting in over 350 shapefiles. These data are point, polyline, and polygon feature types with attribute tables. Final additions to the GIS will include links to seismic data, well logs, and other geophysical data. Also, nomenclature issues will be addressed to standardize paleovalley descriptions. Ultimately, the GIS project will enable a good representation of the ancient stream systems preserved offshore Louisiana.

Session 4: Public Safety

The First Ever "Louisiana Geographic Response Plans"
David Gisclair, Louisiana Oil Spill Coordinator's Office (LOSCO)

This presentation will discuss the governmental and technical issues associated with the creation and implementation of the first ever Louisiana Geographic Response Plans (LA GRPs). The presentation will cover two major development aspects of LA GRPs. The first aspect deals with the governmental issues associated with GRP development and how these issues were addressed. The second aspect deals with technical issues which were further divided into Phase I and Phase II. Phase I addresses the development of Sensitive Site Identification (SSI) parameters and methodology for capturing highly sensitive environmental sites including the methodology for setting a site priority level. Phase II addresses Tactical Protection Strategy (TPS) issues including the development of a Job-Aid to determine an appropriate booming protection strategy and the geodatabase model used to capture site specific information required in assigning a protection strategy. This GRP phased approached methodology is being used by US Coast Guard Headquarters in Washington, D.C. as a model throughout the country. Learning Objectives 1: Inform the GIS community of the existence of LA GRPs. Learning Objectives 2: Educate the GIS community on the assumptions and limitations of LA GRPs. Learning Objectives 1: Obtain GIS community feedback on possible improvements to the LA GRPs.

Safety Planning in a Virtual Environment
Lamar Davis[1],Steve McKinney[2]
[1]Auburn University at Montgomery
[2]SICS Consultants

This session will demonstrate how, Virtual Alabama and the Virtual Infrastructure Safety System, a 3D visualization tool based on Google Earth technology can be used to share information among agencies in planning, response, and recovery from man-made and natural disasters that occur in K-12 schools, colleges, universities, medical centers, industry and other critical infrastructure sites. During times of crisis critical information such as floor plans, evacuation routes, safety equipment, hazardous chemicals, gas lines, electrical panels, live video surveillance cameras feeds, and over 51 other items can be visually shared among first responders by administrators. By 2013, Virtual Alabama had over 41,000 users in over 5,000 agencies across the State. Floor plans for over 1,500 public K-12 schools, 3 public universities, seven community colleges, and a medical center have been entered into this virtual sharing tool. This session will demonstrate the capabilities of this tool and allow you to visualize how you can utilize this technology to share emergency operations plans for schools, hospitals, colleges and universities, and other critical infrastructure with

first responders to plan, respond, and recovery from crisis.

St. James Parish 2013 Backwater Data Improvements
Ryan Donadieu, Bobby Lear, Scott Louque
St. James Parish Government

Session 5: Coastal Resiliency

System Engineering Analysis for the Hurricane Surge Defense System of the East Bank of the Greater New Orleans Area
Ezra Boyd[1], John Lopez[1], Rune Storesund[2]
[1]Lake Pontchartrain Basin Foundation
[2]Storesund Consulting, LLC

A comprehensive study by the Lake Pontchartrain Basin Foundation (LPBF) sought to address a major lesson learned from the catastrophic flooding of 2005 during Hurricane Katrina. As noted in five independent studies of the levee failures and associated flooding, the surge defense system has been largely designed and constructed in a piecemeal manner without an overarching system approach. It was a "system in name only". In contrast, experience in the aerospace, defense, offshore, telecommunications, and other industries has shown that it is possible to design, construct, and operate large, complex, safety-critical engineering efforts from a systems perspective which takes into account issues related to the project's entire life cycle, interactions between the system elements, and the human and operational factors of concern. The current study applied existing methods from systems engineering to the greater New Orleans (GNO) Hurricane Surge Defense System (HSDS), as specified by the Multiple Lines of Defense Strategy (MLODS). Toward addressing this lesson learned, the HSDS study further specified and elaborated upon MLODS, introduced by Lopez in 2006. MLODS explicitly couples structural surge defenses (levees, floodgates, and pump stations), with coastal and community lines of defense. The coastal lines of defense consist of the features of Louisiana's coastal landscape, such as barrier islands, marsh landbridges, and natural ridges, that mitigate storm surge in front of the structural defenses. The community lines of defense are the policies and practices that communities and individuals undertake to reduce their flood risk. These include house elevation, evacuation plans, and insurance. This paper describes how MLODS was used to specify the system using the concepts and tools of systems engineering, SysML, and QMAS.

Spatial Analysis of Post-Hurricane Katrina Thermal Pattern and Intensity in Greater New Orleans:
Implications for Urban Heat Island Phenomenon
Aram Parrish Lief, University of New Orleans

In 2005, Hurricane Katrina's diverse consequences included damaged and destroyed trees, and other despoiled vegetation. This increased the exposure of artificial and bare surfaces, known drivers that contribute to the climatic phenomenon known as the urban heat island (UHI). This poster summarizes some of the findings from an investigation on UHI in the aftermath of Hurricane Katrina, which entailed the analysis of pre and post-hurricane Katrina thermal imagery of the study area, including changes to surface heat patterns and vegetative cover. The thermal band from Landsat TM imagery was used to show changes to the pattern and intensity of the UHI effect, caused by an extreme weather event. Remote sensing visualization methods, in situ data, and local knowledge were used to demonstrate a measurable change in the pattern and intensity of surface heat, as well as concomitant changes to vegetative land cover. This finding may be relevant for urban planners and citizens, especially in the context of recovery from a large-scale disaster of a coastal city, regarding future weather events, and other natural and human repercussions.

Pecan Island Case Study: Telling the Collective Story of Land Change
JoAnne DeRouen, University of Louisiana at Lafayette, Coastal Community Resilience Studio

Session 6: Elevation and Imagery

3D Elevation Program and Louisiana Lidar
Chris Cretini, U.S. Geological Survey

The 3D Elevation Program (3DEP) initiative is being developed to respond to growing needs for high-quality

topographic data and for a wide range of other three-dimensional representations of the Nation's natural and constructed features. The primary goal of 3DEP is to systematically collect enhanced elevation data in the form of high-quality light detection and ranging (lidar) data over the conterminous United States, Hawaii, and the U.S. territories, with data acquired over an 8-year period.

Small Unmanned Aerial Systems - This Changes Everything
Lewis Graham, GeoCue Corporation

Small (actually, micro) Unmanned Aerial Systems (sUAS) are on the verge of entering the mainstream of aerial acquisition for metric applications. The implementation of variations of the Semi-Global Matching (SGM) algorithm enables rapid development of 3D point clouds from very light-weight camera systems deployed on battery operated, remote piloted aircraft with total masses of under 1 kg . Does this emerging technology matter? What sorts of applications are amenable to sUAS missions? Will this technology be disruptive or augmentative? In this presentation, we will examine the current state of the sUAS industry, market forces and technical barriers/enablers. The presentation will focus on the practical side of the industry and will enable the attendees to make informed decisions regarding the impact of sUAS on their business models. The presentation will include results of some actual sUAS data processing scenarios.

Validation of the 3-Meter Topobathymetric Elevation Model for Southern Louisiana
Gayla A. Evans, Jeffrey J. Danielson, Dean J. Tyler, John A. Barras, John C. Brock
U.S. Geological Survey

During the last several decades, Digital Elevation Models (DEMs) have been used in a variety of hydrological, climatological, and geomorphological applications. In particular, topobathymetric elevation data have been useful for many earth science applications, such as the development of hydrodynamic, sediment-transport, and storm surge models. As part of the Coastal National Elevation Database (CoNED) project, a 3-meter topobathymetric elevation model was developed for Southern Louisiana by integrating dozens of high-resolution lidar and bathymetric surveys acquired by numerous collaborators. The model extends from the Alabama/Florida border on the east to the Louisiana/Texas border on the west and encompasses the offshore barrier island systems. An absolute vertical accuracy assessment will be conducted by spatially comparing the 3-meter topobathymetric elevation model with control benchmarks collected by the State of Louisiana Coastal Protection and Restoration Authority (CPRA). In addition, the relative vertical accuracy will be generated comparing the topobathymetric elevation model to equivalent raster elevation datasets. Results from the analysis will be reported in both Root Mean Square Error (RMSE) and Linear Error at 95% confidence interval. Accuracy results will be stratified by land cover type using the National Land Cover Dataset (NLCD) to examine the spatial distribution of the vertical error statistics. The accuracy of the elevation surface plays a central role in modeling applications such as wetland modeling, inundation mapping, and the assessment of sea level rise.

Precision Street Panos in GIS
Dan Bellissemo, CycloMedia Technology , Inc.

The goal is to teach users that accuracy and measurements can be done in a panoramic image based on technology currently available to be able to gather information that solves problems in all aspects of asset management.

Session 7: Remote Sensing

America View and Landsat
Brent Yantis, UL Lafayette/NASA Regional Application Center

AmericaView (AV) is a nationwide partnership of remote sensing scientists who support the use of Landsat and other public domain remotely sensed satellite data through applied remote sensing research, K-12 and higher STEM education, workforce development, and technology transfer. Landsat represents the world's longest continuously acquired collection of space-based moderate-resolution land remote sensing data. Four decades of imagery provides a unique resource for those who work in agriculture, geology, forestry, regional planning, education, mapping, and global change research.

Satellite-derived chlorophyll variability and linkages to large hypoxic events along the Louisiana coast
Eurico D'Sa, Department of Oceanography and Coastal Sciences, Coastal Studies Institute, Louisiana State University

Surface chlorophyll concentrations (Chl) derived from the Sea-viewing Wide Field-of-view Sensor (SeaWiFS) were examined in conjunction with river discharge and QuikSCAT satellite derived winds along the Louisiana coast, USA. A comparison of over ten years river discharge and monthly Chl data indicated Chl variability to be well correlated to seasonal river discharge at locations near the two river deltas, while offshore, cross-shelf transport or mixing associated with strong northerly wind stress contributed to increased Chl during fall-winter season. Variance in Chl examined using wavelet analysis applied to nearly ten years (1998-2007) of SeaWiFS data indicated patterns of significant Chl variability due to combined enhanced wind and river discharge, offshore flows associated with Ekman transport and coastal wind convergence; however, instances of significant Chl variance during the period also occurred during years of large hypoxic zone size suggesting potential linkages to hypoxia.

Landscape scale assessment of floodplain inundation frequency using Landsat imagery
Yvonne Allen, US Fish and Wildlife Service

The floodplain is an integral part of large river ecosystems and the timing, extent, duration, and frequency of floodplain inundation greatly affects habitat quality. Seasonal high flows provide connectivity from the mainstem river to the floodplain and seasonal inundation of the floodplain drives aquatic system productivity. River regulation and other hydrologic alteration have altered the connectivity of many rivers with the adjacent floodplain – impacting the function of wetlands on the floodplain and in turn, impacting the mainstem river function. Effective conservation and management of the remaining floodplain resources can be improved through an understanding of the spatial extent and frequency of inundation at a scale that is relevant to the targeted species of interest. Land cover datasets can provide extremely valuable information related to the physical structure of habitats that may be seasonally inundated. However, in the absence of a detailed numerical hydrologic model, spatial data products describing dynamic aspects floodplain inundation are typically not widely available. Remotely sensed imagery has been widely used to identify the extent and frequency of floodplain inundation during peak flood events. This presentation introduces a method for capturing inundation extent and inundation dynamics within the Gulf Coastal Plains and Ozarks Landscape Conservation Cooperative (180 million acres) using Landsat imagery. It also presents a flexible methodology for linking the observed inundation extent and frequency with long term gage measurements so that the outcomes may be useful in defining meaningful critical thresholds for a variety of floodplain affected organisms.

Estimation of the monthly distribution of pCO2 in surface the ocean from remotely sensed temperature and salinity
Jinchun Yuan, Department of Natural Sciences, Elizabeth City State University

The distribution of sea surface pCO_2 is essential for estimating the distribution of air-sea flux of carbon dioxide and consequently the fate of anthropogenic carbon. pCO_2 and other carbon dioxide parameters have been determined by shipboard sampling and measuring methods that are extremely inefficient, especially when the distribution of such important parameters are needed for global ocean on annual or monthly frequencies. Recently, linear and non-linear regressions equations relating pCO_2 to temperature, salinity, *chl a*, depth of mixed layer and other parameters were reported for different regions of the ocean. Since some of these latter parameters can be determined from satellite remote sensing, these equations, therefore, can be used to estimate the distribution of carbon dioxide in surface oceans more efficiently. We have conducted a multi-linear and nonlinear regressions of pCO_2 on temperature and salinity based on a field dataset that covers all the major ocean basins. Additionally, monthly distribution of remotely sensed sea surface temperature and salinity for the oceans from November 2012 to January 2014 were obtained. The sea surface temperature and salinity data were then used to estimate monthly pCO_2 distribution with the regression equations derived above.

Session 8: GIS Coordination in Louisiana

Louisiana Geographic Information Systems Council Update
Gus Rowland, Louisiana Department of Agriculture and Forestry

GIS Coordination: We Know What Works
Craig Johnson, Louisiana Geographic Information Center

GIS and Louisiana Artifacts
Aimee Preau, Federal Emergency Management Agency

Posters

12 Years of the Louisiana Coastwide Nutria Control Program: 2002-2014
Leslie Couvillion, Coastal Environments, Inc.

The Coastwide Nutria Control Program (CNCP) aims to significantly reduce damage to Louisiana's coastal wetlands resulting from nutria herbivory by removing 400,000 nutria annually. The nutria (Myocastor coypus), native to South America, is an introduced and invasive semi-aquatic rodent. Populations in coastal Louisiana began from escapes and possible releases from nutria farms in the 1930s. Nutria overpopulation and ongoing herbivory damage has impacted as much as 80,000 acres of Louisiana coastal wetlands annually. The CNCP was implemented in order to manage the threat of nutria damage and help to stabilize the coastal ecosystem. Since the introduction of the CNCP, the estimate of impacted acres has been reduced to under 10,000 acres annually. Incentive payments are offered to registered trappers/hunters for each legal nutria tail delivered to established collection centers across south Louisiana. Trappers/hunters are required to report harvest location for each transaction. These locations are tracked by individual hunting lease and reported weekly. The project is funded by the Coastal Wetlands Planning Protection and Restoration Act (CWPPRA) through the Natural Resources Conservation Service (NRCS) and the Louisiana Department of Natural Resources (LDNR) with the Louisiana Department of Wildlife and Fisheries (LDWF) as the lead implementing agency.

Mapping Fall and Winter Waterfowl Habitat on Inland Agricultural Lands in the Louisiana Chenier Plain from 2008-2014
Enwright NE[1], Parr MW[2], Brasher MG[3], DeMaso SJ[2], Wilson BC[2], and Vermillion WG[2]
[1] U.S. Geological Survey, National Wetlands Research Center
[2] U.S. Fish and Wildlife Service, Gulf Coast Joint Venture
[3] Ducks Unlimited, Inc., Gulf Coast Joint Venture

The Gulf Coast Joint Venture (GCJV) uses bioenergetic models (i.e., models that incorporate species specific-population abundance objectives, temporal residency, daily energy demand of birds, and foraging energy values of habitats) to translate regional waterfowl population targets into quantitative habitat objectives that are expected to represent landscape conditions needed to support populations at desired levels. Periodic assessments of landscape conditions are essential for evaluating progress towards objectives and informing regional conservation priorities. The GCJV estimates the acres of flooded agricultural lands and moist-soil habitats using modified normalized difference water index (MNDWI) thresholding of cloud-free satellite imagery (i.e., Landsat TM 5, Landsat Operational Land Imager [OLI], SPOT 4/5) for three windows within the fall/winter seasons (i.e., early [16 Aug-31 Oct], middle [1 Nov-15 Jan], and late [16 Jan-31 Mar]). The temporal period for this effort is 1985 to present, for which six assessment years (i.e., 2008-2014) have currently been mapped. This presentation outlines the methodology used in these assessments and explores the temporal and spatial trends in waterfowl habitat abundance relative to GCJV habitat objectives in the Louisiana Chenier Plain, 2008-2014. These data can also be combined across years to produce inundation frequency maps for identifying inter-annual trends in the spatial distribution of habitat within early, middle, and late assessment periods. Results from this assessment provide not only a metric for evaluating fall and winter habitat abundance relative to habitat objectives, but may also be useful for identifying areas where intensification or adaptation of conservation delivery programs are most needed or could be most effective.

Vegetation Types in Coastal Louisiana in 2013
Charles E. Sasser[1], Jenneke M. Visser[2], Edmond Mouton[3], Jeb Linscombe[3], Steve B. Hartley[4]
[1]Louisiana State University
[2]University of Louisiana at Lafayette
[3]Louisiana Department of Wildlife and Fisheries
[4]U.S. Geological Survey

During the summer of 2013, the U.S. Geological Survey, Louisiana State University, University of Louisiana at Lafayette, and the Louisiana Department of Wildlife and Fisheries Coastal and Nongame Resources Division jointly

completed an aerial survey to collect data on 2013 vegetation types in coastal Louisiana. Plant species were listed and their abundance classified. On the basis of species composition and abundance, each marsh sampling station was assigned a marsh type: fresh, intermediate, brackish, or saline (saltwater) marsh. The current map presents the data collected in this effort.

Mapping Coastal Louisiana (2008)

William R. Jones[1], Adrienne Garber[2]
[1]U.S. Geological Survey
[2]Five Rivers Services

For many years, The U.S. Geological Survey's National Wetlands Research Center (NWRC) in Lafayette, Louisiana, has been at the forefront of mapping Louisiana's fragile coastline. Louisiana loses approximately 75 square kilometers of wetlands annually. Contributing factors to wetland loss include oil and gas exploration, natural subsidence, wave and tidal energy, as well as severe storms. Louisiana's coastline was last mapped in it's entirety in 1988. NWRC is currently engaged in mapping airborne color infrared imagery acquired in 2008 to contrast with earlier map products dated 1956, 1978 and 1988. Wetland classes are delineated according to the US Fish and Wildlife Service (USFWS) "Classification of Wetlands and Deepwater Habitats of the United States" (Cowardin et al, 1979) following National Wetlands Inventory Mapping Conventions. Tidal and nontidal marsh, mangrove, wrack, aquatic vegetation, mudflats, uplands and deepwater habitats (among others) are being identified at a minimum mapping unit of .02 acre, which make this dataset extremely detailed and highly informative. This mapping product will be used to identify specific areas of change and trends over time. It will provide a valuable resource for decision-support tools and planning activities supported by the Coastal Wetlands Planning, Protection and Restoration Act (CWPPRA) and the Coast-Wide Reference Monitoring System (CRMS). These two programs are designed to evaluate the success of various restoration projects and priorities. This new 2008 habitat map product and database will provide a much needed update of wetland gain and loss, with a measurable degree of accuracy, of benefit to decision makers and planners for sustaining Louisiana's coast.

High School Student-driven Remote Sensing Projects Investigating Coastal Issues

Diane Maygarden[1], Mary Mysing-Gubala[2], Janell Simpson[3]
[1]Universityof New Orleans, Pontchartrain Institute for Environmental Sciences
[2]Benjamin Franklin High School
[3]Patrick F. Taylor Science and Technology Academy

UNO Pontchartrain Institute for Environmental Sciences is collaborating with Benjamin Franklin High School and Patrick Taylor Science and Technology Academy to implement a NOAA-funded project "Rx for the Coast: Preparing the Next Generation to Protect New Orleans". This project engages high school students in problem-based inquiry research in the Science, Technology, Engineering and Mathematics (STEM) disciplines, while focusing on the importance of the coastal wetlands that surround the city of New Orleans. The project exposes high school students to remote sensing research designed to answer challenging questions about coastal restoration in Louisiana. The students choose a topic of interest and a question to investigate and staff from UNO provide the resources and expertise to guide the project. In the fall semester of 2013, the project provided guidance for the completion of more than 20 student research projects. These projects competed at school and regional science and engineering fairs. Several projects placed at regional level. Examples of the research include: "The Study of Marsh health Before and After Freshwater Diversion in the Caernarvon wetlands"; "The Effect of Water Flow Volume of Freshwater Diversions on Marsh Vegetation Health" "The Effectiveness of Natural Shoreline Versus Armored shoreline in the Prevention of coastal Erosion"; and Long and Short Term Effects of Burning on Marsh Health using Near-Infrared Remote Sensing". Participating students' work will be featured in this poster presentation.

Development of the Holocene-Pleistocene Surface in the Louisiana Coastal Zone

Paul V. Heinrich, Robert Paulsell, John Snead, Riley Milner, Hampton Peele
Louisiana State University, Louisiana Geological Survey

The Louisiana Geological Survey (LGS) has undertaken the research, compilation, and development a three-dimensional GIS dataset of a regional unconformity known as the "Base of the Holocene" or "Holocene-Pleistocene surface" within the Louisiana coastal plain and portions of the adjacent continental shelf. The Office of Coastal Protection and Restoration (OCPR) have provided funding. A major limitation of the available sources for mapping the Holocene-Pleistocene surface is that there exists no single comprehensive map covering the entire Louisiana coastal

zone. As result, the available data consists of maps created by various authors at different times in different study areas, and using different criteria. Detailed descriptions of how these maps were created vary greatly from source to source. Many gaps in the data exist as well as conflicts in interpretations. New mapping is being created from the borings for U.S. Army Corps of Engineers (USACE) projects, logs of water wells, Department of Transportation and Development (DOTD) soil borings for bridges and other transportation infrastructure, and available borings from published research. Areas of insufficient data will be identified to locate future coastal project boring sites for data acquisition. Most of coastal compaction happens within the thickness of topstratum deposits. A better understanding of the depth and topography of this surface enables much derivative research into subsidence and land-loss. Better knowledge of the Holocene-Pleistocene surface provides engineers with a tool for planning site investigations and foundations for major structures. It is anticipated that a detailed, intermediate-scale model of the Holocene-Pleistocene surface will offer improvement in subsidence calculations for engineering design, reduce uncertainties in accessing future environmental conditions, and improve data and assumptions used in predictive modeling and decision-making.

Mapping of Late Quaternary Paleovalleys on the Outer Continental Shelf Offshore Louisiana
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Pleistocene continental glaciation has repeatedly lowered global sea levels as much as up to 120 m below present levels. Alternating lowstands and highstands resulted in the deposition of shelf-phase deltas on the offshore Louisiana continental shelf and the formation incision of valleys within them. Geomorphic Stratigraphic surfaces associated with these deltas and buried within paleovalleys might contain represent archaeological deposits preserved paleolandscapes with potential cultural that significance have survived postglacial sea-level rise. Fluvial sediments filling these paleovalleys are potential sources of sand for long-term coastal nourishment restoration projects. This project is sponsored by the U.S. Bureau of Ocean Energy Management (BOEM) and comprises the digital synthesis and compilation of legacy paleovalley mapping of paleovalleys spanning nearly 40 years. An integral part of the project has been the development of a Geographic Information Systems (GIS) for visual representation, analysis, and computational support. The core of the GIS work has been to develop digital data from raster geophysical maps that exist as Portable Document Format (PDF) files. Many different geologists and geophysicists prepared these interpretations since ca. 1975. The process of developing GIS data from legacy maps is detail-intensive. Initial steps were to determine which of the many maps contain information relevant to the study (e.g. ancient river valleys or paleovalleys). Raster images were georeferenced and digitized into a vector format resulting in over 350 shapefiles. These data are point, polyline, and polygon feature types with attribute tables.
Final additions to the GIS will include links to seismic data, well logs, and other geophysical data. Also, nomenclature issues will be addressed to standardize paleovalley descriptions. Ultimately, the GIS project will enable a good representation of the ancient stream systems preserved offshore Louisiana.

Student Poster Contest

Preliminary Mapping of Geohazards in the Churia Region of Nepal
Terri Bannister, University of Louisiana at Lafayette, School of Geosciences Geology Department

Landslides, debris flow, and flood inundation hazards are linked geological and hydrological phenomena, while their impacts are closely tied to anthropogenic factors. In the Churia region of Nepal, destruction and casualties related to landslides, debris flows, and flooding have become common during the monsoon season. Landslides are the most common natural hazards in the hills while flooding is the most common in the plains. The magnitude and frequency of these geohazards is higher in the eastern Churia than the western part; the Dudhauria Bangeri and Chandi watersheds in Bara and Rautahat districts, respectively, represent a transition zone across the region within which scientific findings can be generated and modeled across the wider Churia region. Little work has been done to quantify the correlation between changes in human activities and changes in the frequency and magnitude of Churia geohazards. An improved understanding of the linkages between the human dimension, dynamic monsoon hydrologic cycle, landslides, debris flows, and inundation hazards in Churia will assist policy makers in hazard mitigation. Remote Sensing and Geographic Information Systems (GIS) can provide accurate and cost effective tools to monitor such hazards.

An ArcGIS Analysis of the Future Climatic and Topographic Suitability for Viticulture in the Tulbagh Valley, South Africa

Jana C. Brady, Louisiana State University

Viticulture has maintained a long tradition in South Africa beginning in the late 17th century when Dutch settlers first planted European vines in the Cape Colony. Recognizing that the southwestern tip of Africa, with its hot, dry summers and cool, wet winters, would be a favorable climate for wine grapes, colonists planted cultivars found throughout the great wine regions of Spain, France, and Italy. Post-apartheid wine production has seen unprecedented expansion, becoming a multimillion-dollar industry with nearly 900 million liters produced in 2012. The success of wine production in the temperate climate around Cape Town prompted some growers to find less-saturated areas to stake their claim in the industry. The Tulbagh Valley was one such region. Large-scale wine production began in the valley in 1996 and by 2007 boasted nearly two-dozen wineries. Tulbagh's economy has also benefitted from an increase in wine-related tourism and the industry appears to be ripe for expansion across the valley. This project assesses the future viability of the wine industry in the Tulbagh Valley. The valley is expected to become hotter and dryer over the next few decades, resulting in the potential for economic disaster to strike the region. Digital elevation models and historical climate records are used with ArcGIS v10.2 to model the current climate and make predictions on what conditions will be like at future time horizons. Additional analyses of relevant factors like elevation, slope and aspect are used to create a holistic view of the wine industry in the Tulbagh Valley.

Monitoring Pocosin Lakes Wildlife Refuge Regrowth Using Arc GIS and Landsat Images

Tracy P. Curlings, Elizabeth City State University

Pocosin Lakes National Wildlife Refuge habitat is a unique fire-adapted ecosystem consisting of a dense shrub under-story, a pond pine over-story and grows on organic soils with depths up to 12 feet. Pocosin Lakes National Wildlife Refuge is home to over 300 species and several endangered species such as the red-cockaded woodpecker and the red wolf. By protecting wildlife areas with prescribed burns we can help prevent naturally occurring high-intensity fires that can destroy the area. By burning off old vegetation we can see how quickly the vegetation can recover. By using Landsat images we can monitor the vegetation growth after a fire has burnt an area and see how long it takes to recover. The recovery is important for the protection of endangered species and other animals. Satellite images show us that the ground vegetation can recover quickly. Since, low to moderate-intensity fires typically leave the biggest and most vigorous trees alive, some forest cover will remain and will recover faster. Area effect by fire can recover faster near water than an area that isn't near water. The vegetation can recover 50 to 60% by six to eight months and we can see that it takes longer for the trees to recover. By monitoring the vegetation growth we can see the overall effect that the fire has had on the plants.

Identifying hydrologic relationships in floodplain vegetation classes

Erin L. Johnson, Richard F. Keim, Sammy L. King
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The frequency, timing, and depth of flooding within floodplains greatly affect plant composition. Recent work has defined spatial polygons of potential natural vegetation (PNV) classes for the White River floodplain, Arkansas, which supports the second largest tract of bottomland hardwoods in the southeast. These classes are an attempt to integrate the hydrology, geomorphology, soils, and microtopography that create identifiable ecotypes. Hydrologic processes have been affected by recent changes in the watershed, but we are unsure how these changes may alter the PNV class composition and ultimately the productive ecosystem. To investigate potential changes to PNV classes, we need an understanding of flood hydrology both among and within these classes. To determine to the range of flooding in PNV classes, we used HEC-RAS to model past flood events, then used HEC-GeoRAS to estimate flood depths across the floodplain. We created flooding hydrographs for points within each PNV class. Results show there is a wide range of flood depth within each PNV class. When hydrographs are compared within PNV classes, there are groupings of similar flooding depth and duration that may indicate systematic grouping of ecosystems within PNV class. These hydrographs quantify hydrological differences among and within the PNV classes and allow estimation of flooding effects on tree species composition.

Classification of National Park Land Cover

Casey Johnston[1], Jeff Bracewell[2], Wesley Palmer[1]
[1]Louisiana Tech University
[2]National Park Service

The Palo Alto Battlefield National Historical Park requested a land cover classification across their park boundary to record the spread of the invasive mesquite population. The trees were compromising the authenticity of the historical landscape. The NPS provided imagery spanning the 17 years between 1995-2012. Using this assorted data, the land cover was classified to show the extent of the mesquite tree inside the park. Mesquite is very hard to eradicate so the location of every tree was crucial to its extermination. The results successfully showed the spreading of the invasive species.

Geospatial Analysis of Factors Predictive of Blight and Adjudication in Lafayette, LA

Chad M. LaComb, Southern University Law Center; Department of Planning, Zoning, and Development, Lafayette Consolidated Government

Adjudicated properties are properties whose tax title has been listed for sale for non-payment of property taxes, but have failed to sell and are subsequently sold or "adjudicated" to the political subdivision to which the statutory assessments are owed. Adjudicated properties are ones that have been removed from commerce. They represent a direct and indirect drain on local governmental resources. This paper will examine the complex interconnection of social, cultural, legal, and geographic factors that increase the likelihood of a property becoming adjudicated. Lafayette Parish has total population of 227,055 with more than half residing within the city limits of Lafayette. In 2005 there were approximately 108,000 parcels on the assessor's tax rolls. Of these, 530 were listed as adjudicated. By 2010 this number had increased to 741 - an increase of over 40%. Over 70% are located within the City of Lafayette. In 2011, over 90% of these adjudicated properties were residential parcels. While less than 0.7% of all parcels in Lafayette Parish are adjudicated, those parcels that are adjudicated are concentrated in a relatively small geographic area in the city's urban core. In general, prior adjudicated properties were highly predictive of future adjudications as was racial composition, household income, and code enforcement actions. Geospatial clusters of adjudicated property were identified for potential future resource allocation. A semantic model describing the phases that a property goes through on the path to adjudication was developed and is more fully described in this paper.

A Hybrid Model of Cellular Automata, Markov, and Logistic Regression for Land Change Prediction in the Lower Mississippi River Basin

Kenan Li, Nina Lam
Louisiana State University, Department of Environmental Sciences

This study is aiming at developing an integrated approach in predicting land changes, with better understanding of socioeconomic drivers. Markov process is used to determine the transition areas and prior probability, logistic regression is used to derive the rules, and cellular automata is used to take neighborhood impacts into account. The implementation of this model can contribute to a better understanding of the environmental and socioeconomic factors that promote land changes, and give precise and detailed information about potential land conversion for decision makers to assess new development needs, their location, and characteristics.

The Heat Island New Orleans: Examining the Thermal Pattern and Intensity in the Aftermath Hurricane Katrina

Aram Parrish Lief, University of New Orleans

In 2005, Hurricane Katrina's diverse consequences included damaged and destroyed trees, and other despoiled vegetation. This increased the exposure of artificial and bare surfaces, known drivers that contribute to the climatic phenomenon known as the urban heat island (UHI). This poster summarizes some of the findings from an investigation on UHI in the aftermath of Hurricane Katrina, which entailed the analysis of pre and post-hurricane Katrina thermal imagery of the study area, including changes to surface heat patterns and vegetative cover. The thermal band from Landsat TM imagery was used to show changes to the pattern and intensity of the UHI effect, caused by an extreme weather event. Remote sensing visualization methods, in situ data, and local knowledge were used to demonstrate a measurable change in the pattern and intensity of surface heat, as well as concomitant changes to vegetative land cover. This finding may be relevant for urban planners and citizens, especially in the context of recovery from a large-scale disaster of a coastal city, regarding future weather events, and other natural and human

repercussions.

Developing Coastal Wetland Management on the Chenier Plain Using Geospatial Analysis of Natural and Anthropogenic Land Change
D. Stephen Nevitt II, Whitney P. Broussard III
University of Louisiana at Lafayette

The Cheniere Plain's topography is extremely flat. Therefore the hydrology of the area is very sensitive to all other factors, because there is basically no elevation. Land use changes that affect elevation have been common in this area since European settlement.(find out when settlement was.) Our data aims to find the land use changes that have had the most affect on hydrology. And to find which hydrologic functions have the largest impact on land. These manipulations cause land loss and vegetation changes. Construction of a raised roadway from Oak Grove to Grand Cheniere to Pecan Island to Forked Island has created a constantly maintained hydrologic barrier. This prevents large amounts of water from utilizing sheet flow to make its way across the land washing salt water out and depositing nutrients and sediments. Instead the water is channeled through a water control structure. The minerals and nutrients remain suspended while they are transported swiftly to gulf. Further creation of hydrologically impounded fields for agriculture has affected land loss. Agriculture fields have degraded into flooded marsh. Mismanagement of these impounded marshes has led to entire fields disappearing.

Twenty Years of Change in Louisiana Coastal Vegetation
Alexandrea Pasch, Jenneke M. Visser, Whitney P. Broussard III

Sea level rise is detrimental to the survival of coastal vegetation. Since 1997 a consistent coastal vegetation survey has been performed at 4-6 year time intervals. This project focuses on four species that represent the most common species along the salinity gradient: Spartina alterniflora (oystergrass), Spartina patens (wiregrass), Sagittaria lancifolia (bulltongue), and Panicum hemitomon (maidencane). Objective of this GIS project is to display change over time along the Louisiana coast. The coastal vegetation survey identified species and their abundance at specific points along transects. The four species used in this study display response to salinity and water level encroachment inland. The coastal vegetation data collected shows significant change over the 20 year timespan. In this study we relate the changes to possible forcing functions such as sea level rise.

Using Comparison of Soil Water Assessment Tool (SWAT) and Generalized Watershed Loading Function (GWLF) Models For Identifying Critical Source Areas Of Nonpoint Pollution In The Corney Bayou Watershed In Louisiana
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Nonpoint source (NPS) pollution is one of the major sources of water pollution in the United States. Pollution from agriculture sources primarily from fertilizer and manure applications has been contributing substantial amount of nutrient pollution in waterbodies. Critical source area (CSA) is the area which contributes the most amounts of pollutants in waterbodies. Adoption of best management practices (BMPs) in the CSA can potentially help to reduce pollutants in the waterbodies. However, identification of CSA and adoption of optimal BMPs within the CSA are a challenge. Our objective is to identify these two things using both the SWAT and GWLF programs. SWAT is a semi-distributed watershed model that was primarily developed to predict the impact of land management practices on water, sediment, and agricultural chemical yields. While GWLF is an open source biophysical simulation model which has combined distributed/lumped parameters. For this research work, we selected the Corney Bayoy (HUC 0804020603) watershed located in the northern part of Louisiana. This watershed is shared by Claiborne and Union Parishes. Our research focuses on the impact of poultry production and resulting manure runoff or leaching into waterbodies. We identify CSAs and alternative combination of BMPs that are able to reduce the amount of pollutants in the waterbodies. We compare the results from both SWAT and GWLF biophysical simulation models.

Spruill Farm Past Erosion Calculations Using DSAS Tool, ArcGIS, Landsat and Aerial Photographs
Kristen Stilson, Elizabeth City State University

Spruill Farm in Washington, NC has been donated to the public and conservation groups to provide low-impact open access to the sound, land for organic and sustainable farming, conservation education, and to study shoreline changes

and protection methods due to sea level rise in the Albemarle Sound. Currently two modes of conservation are in place: bulkhead and natural shoreline. In order to study the effects of these the amount of shoreline erosion from the past needed to be calculated. Using the DSAS (Digital Shoreline Analysis System), ArcGIS, aerial photographs from the USGS (U.S. Geological Survey), and satellite images from Landsat 7 the amount of erosion from 1950 until 2012 was calculated. A combination of aerial and satellite images was required due to lack of aerial photography and poor resolution and/or cloud cover of satellite images dating back to the 1950's. The amount of calculated erosion over the past 62 years was up to 20 meters in some of the 488 meters of shoreline. With the expected erosion for each transect calculated we can begin to assess the impact the methods of protection are having on the shoreline over the next few years and determine which method is better suited for the Albemarle Sound and surrounding areas.