

The 37<sup>th</sup> annual

***Applied Geography Conference***

October 15 – 17, 2014

**Proceedings and Abstracts**

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# *Applied Geography Conferences*

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**Wei Song**, University of Louisville

## Conference at a Glance

### Wednesday, 10/15/2014

1:30 pm – 3:00 pm

Room 301 – Economic Analysis  
Room 302 – Health Care  
Room 303 – Geography Education I  
Room 304 – Water Quality Assessment  
Room 305 – Hazards and Response  
Poster Setup

3:30 pm – 5:00 pm

Room 301 – Population Shifts  
Room 302 – Cancer and Loss of Life  
Room 303 – Land Cover Analysis  
Room 304 – Weather and Climate: Global to Local  
Room 305 – Geospatial Analysis I

7:00 pm – 9:30 pm

Room 309-310 – Opening Reception

8:00 pm – 9:30 pm

*Applied Geography*, Editorial Board Meeting

### Thursday, 10/16/2014

8:30 am – 10:00 am

Room 301 – Trade, of Sort  
Room 302 – Crime Analysis  
Room 303 – Geography Education II  
Room 304 – Water Management  
Room 305 – Environmental Management  
Poster Session Begins

10:30 am – 12:00 pm

Room 301 – Retail and Business Geography  
Room 302 – Real and Virtual Activity and Health  
Room 303 – Land Use/Land Cover and Ecology  
Room 304 – Climatic Variability in Plain States  
Room 305 – People and the Environment

1:30 pm – 3:00 pm

Room 301 – Locational Intelligence and Spatial Thinking  
Room 302 – Food Access, Farming and Gardening  
Room 303 – Infrastructure Analysis  
Room 304 – Physical Geography I  
Room 305 – Looking at Hazards

3:30 pm – 5:00 pm

Room 301 – Connecting Practitioners and Students  
Room 302 – Geography of Agriculture  
Room 303 – Land Use/Land Cover Changes  
Room 304 – Physical Geography II  
Room 305 – Geospatial Analysis II

7:00 pm – 8:00 pm

AGC Board of Directors Meeting

## **Friday, 10/17/2014**

8:30 am – 10:00 am

- Room 301 – Census Data Dissemination and Address Validation
- Room 302 – Addressing health Concerns
- Room 303 – Infrastructure and Greenspace Access
- Room 304 – Cyclonic Storms

10:30 am – 12:00 pm

- Room 301 – Adaptive Real Estate Strategies
- Room 302 – Birth and Pediatrics
- Room 303 – Urban and Regional Variation
- Room 304 – Air Quality, Weather, Climate and Health
- Room 305 – Culture and thinking

12:30 pm – 3:00 pm

- Crystal Ballroom - Luncheon

The 37<sup>th</sup> annual

***Applied Geography Conference***

October 15 – 17, 2014

**Conference Proceedings**



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WEDNESDAY, OCTOBER 15, 2014

Sessions A: 1:30 PM – 3:00 PM

**ECONOMIC ANALYSIS**

Room: 301

Chair: Bin Zhou, Southern Illinois University Edwardsville

**Spatial Analysis of Informal Economy in Beijing: Case Study of Street Vendors**

Jia Lu, Valdosta State University and Lei Zhang, Renmin University, Beijing, China

**A Note on Economic Concerns Arising from the Drought Conditions in California**

William Roth, Indiana State University, and Cameron Douglas, Eastern Illinois University

**GIS-Based Industrial City Economic Review**

Khalid Mahmood, University of Punjab, Pakistan

**Analyzing Cross-Market Branch Banking Network Structure Using Overlapping Communities: The Case of Illinois**

Bin Zhou, Southern Illinois University Edwardsville

**HEALTH CARE**

Room: 302

Chair: Fahui Wang, Louisiana State University

**Assessment of Flow Patterns of Cancer Patients to Treatment Centers in Southwestern Nigeria: A GIS Approach**

Olagundoye Oludotun, Ondo State Land Records Bureau and Oluwafemi Olawale, National Space Research and Development Agency, Toro, bauchi Nigeria, Nigeria

**Analyzing the Spatial Pattern of Primary Care Physician Locations in Hillsborough County, Florida**

Huairan Ye and Hyun Kim, University of Tennessee

**Mexico's Drug Networks: A Simulation of Smuggling Routes toward the United States**

Monica Medel, Yongmei Lu, and Edwin Chow, Texas State University

**Evaluating and Re-Demarcating the Hospital Service Areas in Florida**

Peng Jia and Fahui Wang, Louisiana State University, and Imam Xierali, Association of American Medical Colleges

## **GEOGRAPHY EDUCATION I**

**Room Room 303**

Chair: Yu Zhou, Bowling Green State University

### **Addressing Functional Map Illiteracy in Community College Students**

Monika Bachmann, Prince George's Community College

### **From Interdisciplinary Geospatial Platform to Mapping Class and Back Again**

Brennan Collins and Tim Hawthorne, Georgia State University

### **Service Learning to Enable Geographic Object Based Image Analysis (GEOBIA) Education and Research**

J. B. Sharma, University of North Georgia

### **Field Studies, Silverton, Colorado: A Model Geography Course for Delivering High Impact Educational Practices (HEPs)**

Brandon Vogt, University of Colorado Colorado Springs

### **Using Clicker to Assess Students' Spatial Learning**

Yu Zhou, Bowling Green State University

## **HAZARDS AND RESPONSE**

**Room: 305**

Chair: Graham A. Tobin, University of South Florida

### **The Spatial Extent and Coverage of Tornado Sirens in San Marcos, Texas**

Paul Zunkel, Texas State University

### **Previous Experience and Tornado Preparedness in Dekalb County, Alabama**

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

### **Striking a Match: Neighborhood Characteristics and Incidence of Fires**

Reid A. Wodicka and Harrison S. Campbell, Jr., University of North Carolina Charlotte

### **Third Sector Organizations, Population Dynamics, and Changing Vulnerabilities Following the 2011 Earthquake in Christchurch, New Zealand**

Nicole S. Hutton, Graham A. Tobin, and Linda M. Whiteford, University of South Florida

**Sessions B: 3:30 PM – 5:00 PM**

## **POPULATION SHIFTS**

**Room: 301**

Chair: Michael R. Ratcliffe, US Census Bureau

### **Taking Advantage of the Improved Availability of Census Data: A First Look at the Gridded Population of the World, Version 4 (GPWv4)**

Erin Doxsey-Whitfield, Susana B. Adamo, Kytt MacManus, Linda Pistoiesi, John Squires, Olena Borkovska, and Sandra Baptista, CIESIN, Columbia University

**Hispanic Population in Washington State: Demographic Change and Spatial Clustering**

Kerry R. Brooks and Dick G. Winchell, Eastern Washington University

**Residential Patterns of Korean Americans in Chicago Metropolitan Area: A Longitudinal Study of Spatial Assimilation in A Multi-Ethnic Context**

Donghee Koh and Sunita George, Western Illinois University

**The Great Recession and Determinants of Migration To and From Florida, 2008-09 and 2004-05**

Everlyn Ravuri, Saginaw Valley State University

**CANCER AND LOSS OF LIFE**

Room: 302

Chair: Timothy Hare, Morehead State University

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John Hart, Greenville, South Carolina

**Geographic Patterns of Years of Potential Life Lost for Mahoning County, Ohio Census Tracts**

Lashale Pugh, Youngstown State University

**Scale and Public Health: Missouri's Cigarette Tax Rate**

Kevin Romig and Kathleen Spears, Northwest Missouri University

**Space-Time Patterns of Respiratory Cancers Incidence and Mortality, Kentucky, 1969-2011**

Timothy Hare, Morehead State University

**LAND COVER ANALYSIS**

Room: 303

Chair: J. B. Sharma, University of North Georgia

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Nathaniel Dede-Bamfo, Texas State University

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Daniel Hulsey and J. B. Sharma, University of North Georgia

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Corryn Smith and J. B. Sharma, University of North Georgia

## **WEATHER AND CLIMATE: GLOBAL TO LOCAL**

Room: 304

Chair: Yingru Li, Auburn University

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Kevin Turcotte, Ball State University

### **Climate Change in Inner Mongolia, China**

Qi Hu and Feifei Pan, University of North Texas, and Xuebiao Pan, China Agricultural University, Beijing, China

### **Statistical Downscaling of MODIS Derived Land Surface Temperatures for Metropolitan Jefferson County, Kentucky**

Jeremy Sandifer, University of Louisville

### **The Study of Urban Heat Islands in Auburn-Opelika, AL Using Remote Sensing and Observational Techniques**

Andrew W. Hug, Auburn University, and L. Joe Morgan, Jacksonville State University, and Chandana Mitra, Auburn University

## **GEOSPATIAL ANALYSIS I**

Room: 305

Chair: Wei Song, University of Louisville

### **A Taxonomic Analysis of Perspectives in Generating Space-Time Research Questions in Environmental Science**

Huanyang Zhao, Kent State University, Bing She and Xiaoyan Zhou, Wuhan University, Wuhan, China, and Xinyue Ye, Kent State University

### **Critical Reflection Mapping as a Hybrid Methodology for Examining Socio-Spatial Perceptions of New Research Sites**

Tara Mitchell, Timothy Hawthorne, Georgia State University, Mary Seidell, Ohio State University, and Lia Scott, Georgia State University

### **Building a Low-Cost Geography Web Portal for Collecting Citizen Science Contributions**

David A. Parr and Michael Scholz, Texas State University

### **Space-Time Interaction of Residential Burglaries in Wuhan, China**

Xinyue Ye, Kent State University, Xiao Xu, Wuhan University, Jay Lee, Kent State University, and Ling Wu, Zhongnan University of Economics & Law, China

### **Open Source REST Services for Environmental Sensor Networking**

Andrew Rettig, University of Cincinnati

## OPENING RECEPTION

7:00 PM – 9:30 PM

Room: Room 309-310

Amy Work, Geospatial Educators Opportunities for Partnership  
Outreach Research and Training (*Geoporter*) Headquarters in Dallas, TX  
One step at a time: Community Change in Costa Rica

## Editorial Board Meeting

*Applied Geography*

8:00 PM – 9:30 PM

Room: 301

Jay Gatrell, Editor

Bellarmino University

# THURSDAY, OCTOBER 16, 2014

Sessions C: 8:30 AM – 10:00 AM

## TRADES, OF SORTS

Room: 301

Chair: Grant Ian Thrall, Business Geography Advisors

### **Internationalization of retailing: The case of Turkey**

Herman Kok, Middle East Technical University, Ankara, Turkey

### **The North American Free Trade Agreement (NAFTA) at 20: An Assessment from a Geographical Perspective**

Denise Blanchard, Texas State University

### **Mexico's Smuggling Network: A Simulation of the Drug Corridors to the United States**

Monica Medel, Texas State University

### **Teacher-Scholar and Practitioner-Scholar**

Grant Ian Thrall, Business Geography Advisors

## CRIME ANALYSIS

Room: 302

Chair: Lin Liu, University of Cincinnati and Sun Yat-Sen University

### **Crime on the Concrete Campus: An Examination of Crime Patterns around the Georgia State University Campus**

Steven P. Ericson, University of Alabama

### **Spatial Relationship and Colocation of Crimes in Jefferson County, Kentucky**

Max Pope and Wei Song, University of Louisville, Louisville

### **Uncovering Spatio-Temporal Patterns of Street Robbery in DP Peninsula, Southern China**

Chong Xu, Lin Liu, Suhong Zhou, Sun Yat-Sen University, China, and Xinyue Ye, Kent State University

### **Exploratory Spatial Data Analysis of the Distribution of Multiple Crimes: A Case Study of Three Coastal Cities**

Sunhui Sim and Andy Miller, University of North Alabama

## GEOGRAPHY EDUCATION II

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Chair: Steve Jennings, University of Colorado Colorado Springs

**Enhancing Teaching and Learning of Geography Concepts in Junior High Schools in Ghana**

Eric Ackuayi, Francisca Adjei-Fianko, and Mavis Boakye

**Pre-service Teachers and Geography Education in Colorado**

Steve Jennings, University of Colorado Colorado Springs

**Assessment of Student Learning by Students in Human Geography at Youngstown State University**

Lashale Pugh, Youngstown State University

**Urban Immersion: Using Films to Teach Urban Social Geography**

James W. Vaughan, University of Texas at San Antonio

**WATER MANAGEMENT**

Room: 304

Chair: Lan Mu, University of Georgia

**Perceptions of Stormwater Management and Barriers to Green Infrastructure Implementation in Lancaster, PA**

Jessica J. Kelly and Brianna Hensel, Millersville University

**Edwards Aquifer Region Stakeholder Group Frame Analysis in A Drought Prone Climate**

William G. Adams, R. Denise Blanchard, and Richard A. Earl, Texas State University

**Expedition Endurance: An Investigation of the Geography of Water Resource Management**

Nate Page, Aric Ascot Pelafas, Jay Bushen, Darius Holland, and Cameron Douglas Craig, Eastern Illinois University

**The Geography of Golf Courses in the U.S. and Water Deficit Caused by Golf Course Water Consumption**

Lan Mu, University of Georgia

**ENVIRONMENTAL MANAGEMENT**

Room: 305

Chair: Ryan D. Bergstrom, Gustavus Adolphus College

**Potential Management of Mountain Environments Using Summit Registers**

Clayton J. Whitesides, Coastal Carolina University

**Eco-conscious tourism on the reef in south water caye, Belize**

Grace C. Chang, Johnny A. Andia, Kimberly M. Twiggs, Timothy L. Hawthorne, and Christy C. Visaggi, Georgia State University

**Back from the Brink: Sustaining Montana's Wildlife Population through Hunter Expenditures**

Ryan D. Bergstrom, Katherine J. Hansen, and Shannon V. Taylor, Gustavus Adolphus College

**Community-Based Application of CPTED Principles and Their Impact on Neighborhood Improvement in Youngstown, Ohio**

Jennifer Burrell, Kent State University

Sessions D: 10:30 AM – 12:00 PM

**RETAIL AND BUSINESS GEOGRAPHY**

**Room: 301**

Organizers and Chairs: Murray Rice, University of North Texas and Tony Hernandez, Ryerson University, Canada

**Assessing the Impact of Scale and Location Type on Retail Store Co-Location: An Exploratory Analysis**

C. Daniel and T. Hernandez, Ryerson University, Canada

**Decoding the Formation of A Retail Giant: The Evolving Geography of Costco's Store Network**

Peter Testa and Murray Rice, University of North Texas

**Examining the Boundaries of Factory Outlet Retailing in Canada**

Murray Rice and T. Hernandez, Ryerson University, Canada

**Assessing Box-Store Location: Implications of the Inner City and Store Type**

Brian Ceh, Kressell Daniel, and Tony Hernandez, Ryerson University, Canada

**A Geographic Perspective on the Walmart Neighborhood Market**

Lawrence Joseph, Arizona State University

**Small Town Change in East Texas: An Analysis of Retail Growth and Decline**

Carl Whitaker and Murray D. Rice, University of North Texas

**REAL AND VIRTUAL ACTIVITY AND HEALTH**

**Room: 302**

Chair: Shunfu Hu, Southern Illinois University Edwardsville

**Expedition Endurance: An Inquiry into Human Survival**

Cameron Douglas, Eastern Illinois University

**Quantifying Location Specific Physical Activity of Individuals through Integration of GPS and Accelerometry**

Sungsoon (Julie) Hwang, Depaul University, Sai Yalla and Ryan Crew, Rosalind Franklin University of Medicine and Science

**Geographically-Based Heat Safety Thresholds in Athletics**

Castle Williams, Minh Phan, Andrew Grundstein, and Bud Cooper, University of Georgia

**GIS Analysis of Depression among Twitter Users**

Wei Yang and Lan Mu, the University of Georgia

**LAND USE/LAND COVER AND ECOLOGY**

Room: 303

Chair: Jia Lu, Valdosta State University

**Decreasing Wetland Cover in East Kolkata, India from 1972 to 2011 as Detected by Remote Sensing Techniques**

Xia Li, Chandana Mitra, Luke Marzen, and Qichun Yang, Auburn University

**Monitoring Environmental Changes at A Local Scale Using Remote Sensing and GIS: Case Study In Small Protected Areas of Northern Cameroon**

Gervais W. Tabopda, Remote Sensing and GIS Consultant, College Park, Georgia

**Use of Landsat Data to Estimate Land Use Changes in Rural Southwestern Bangladesh**

Laura M. Benneyworth, Vanderbilt University

**Landscape Ecology, Urban Morphology, and CBDs: An Analysis of the Columbus Metropolitan Area**

Jia Lu, Valdosta State University

**CLIMATIC VARIABILITY IN PLAINS STATES**

Room: 304

Chair: John Harrington, Jr., , Kansas State University

**Analysis of Current Drought in Texas Compared to the Drought of Record**

Kent M. McGregor, University of North Texas

**Temporal and Spatial Variation in Precipitation Seasonality for Kansas**

Caitlin Dye, Ian Howard, and John Harrington, Jr., Kansas State University

**Spatial and Temporal Analysis of Precipitation Seasonality for the Southern United States**

Ian Howard and John Harrington, Jr., Kansas State University

**Temporal and Spatial Variation in Temperature Seasonality for Kansas**

John Harrington, Jr., Kansas State University

**PEOPLE AND THE ENVIRONMENT**

Room: 305

Chair: Kang Shou Lu, Towson University

**Projecting Regional Sustainability Trends Using Geospatial Analytics**

James K. Lein, Ohio University

**Structure, Composition and Characteristics of Windbreaks: A Case Study from Kansas**

Kabita Ghimire, Robert L. Atchison, and J. M. Shawn Hutchinson, Kansas State University

**Plastics, Pollution, and People: Mapping Marine Debris in Coastal Communities across Belize**

Paulita Bennett-Martin, Emory University, Christy C. Visaggi, and Timothy L. Hawthorne, Georgia State University

**Assessing Impacts of Urban Expansion on Coastal Ecosystems Based on Different Growth Scenarios**

Kang Shou Lu, Towson University, Jeffery S. Allen and Guoxiang Liu, Clemson University, Xiaofeng Wang, Shaanxi Normal University, Xi'an, China

Sessions E: 1:30 PM – 3:00 PM

**LOCATIONAL INTELLIGENCE AND SPATIAL THINKING – A PANEL DISCUSSION ON THE CONCEPTUAL FOUNDATIONS OF OUR DISCIPLINE**

**Room:** 301

**Organizers:** Murray Rice, University of North Texas and Tony Hernandez, Ryerson University, Canada

**Chair:** Murray Rice, University of North Texas

**Panelists:**

Tony Hernandez, Ryerson University, Canada

Joseph Kerski, ESRI, Inc.

Lawrence Joseph, West Marine

Grant Thrall, Business Geography Advisors

Bill Black, Louisiana State University

Larry Carlson, Carlson & Associates

Wes Stroh, Directions Magazine

**FOOD ACCESS, FARMING, AND GARDENING**

**Room:** 302

**Chair:** Timothy Hawthorne, Georgia State University

**Food Access and Opportunity in Rural Southern Illinois: A GIS Analysis**

Charles D. Yeager, Missouri Southern State University

**Evaluating the Relationship between Food Access, Urban Environment, and Food Security in Georgia's Older Population**

Jerry Shannon, Jung Sun Lee, and Steven R. Holloway, the University of Georgia, Arvine Brown, Georgia Division of Aging Services, Atlanta, and Jennifer Bell, the University of Georgia

## **Community Gardening in St. Louis: A Micro-Scale Analysis of What Was Grown**

Dean Gunderson and Gillian Acheson, Southern Illinois University Edwardsville

## **Using Critical GIS to Map the Lived Experiences of Atlanta Urban Farmers and Growers**

Chelsea Zakas, Georgia State University, Heather Cook, University of Denver, Tierney Donnell, Tuskegee University, Jessie Dubus, University of Redlands, Eugene Alala, Imran Battla, and Nicole Bluh, Good Shepherd Agro Ecology Center, Nicole Ryerson and Timothy Hawthorne, Georgia State University

## **INFRASTRUCTURE ANALYSIS**

**Room: 303**

Chair: Jonathan C. Comer, Oklahoma State University

## **Evaluation of Photo/Video Logging Method to Collect Highway Inventory Data**

Mohammad Jalayer, Auburn University, Shunfu Hu, Southern Illinois University Edwardsville, and Huagu Zhou and Rod E. Turochy, Auburn University

## **Designing New Optimal Road Route Using Remote Sensing and GIS Techniques: A Case Study of Takht Bhai and Mandoori, Mardan, Pakistan**

Zia ul Islam, Sajid Rashid Ahmad, Ather Ashraf and Ali Rajab Raza, University of Punjab, Lahore, Pakistan

## **A Spatio-Temporal Analysis of Hotel Locations in Manhattan, New York City**

Ting Du and Yingru Li, Auburn University

## **Community Access to General Aviation amidst Airport Closures, 1991-2011**

Jonathan C. Comer and Thomas A. Wikle, Oklahoma State University

## **PHYSICAL GEOGRAPHY I: GROUNDWATER AND SURFACE WATER**

**Room: 304**

Chair: Richard Earl, Texas State University – San Marcos

## **Groundwater Configuration in the Upper Catchment of Meghadrigedda Reservoir, Visakhapatnam District, Andhra Pradesh, India**

P. Jagadeeswara Rao, Andhra University, Visakhapatnam, India

## **Application of A Diagnostic Soil Moisture Equation for Estimating Root-Zone Soil Moisture in Arid and Semi-Arid Regions**

Feifei Pan, Michael Nieswiadomy, University of North Texas, and Shuan Qian, China National Meteorological Administration, Beijing, China

## **Recharge Estimations for Laguna Pond at Freeman Ranch, San Marcos, Texas**

Erin Dorothea Dascher and Harrison Flores-Ortiz, Texas State University

## **Determining the Timing and Cause of a Low-Gradient, Chronically Hypoxic Reach of the North Branch of the Kawawlin River in Bay County, Michigan, USA**

Rhett Mohler and Nicholas Ross, Saginaw Valley State University

## LOOKING AT HAZARDS

Room: 305

Chair: Burrell Montz, East Carolina University

### **Winter Precipitation Impacts on Automobile Accidents in the United States**

Alan Black, University of Georgia

### **Halloween 2013: Another "100-Year" Storm and Flood in Central Texas**

Richard A. Earl, Tyler R. Jordan, and Dana Scanes, Texas State University

### **An Application of the Pressure and Release Model in Gadsden County, Florida**

Brian R. Norris and Philip L. Chaney, Auburn University

### **Hurricane Dynamics and Risk Perceptions: A Case Study of Hurricane Irene in North Carolina**

Burrell Montz and William Pace, East Carolina University

## Sessions F: 3:30 PM – 5:00 PM

## CONNECTING PRACTITIONERS AND STUDENTS – ADVICE ON CAREER DEVELOPMENT IN THE FIELD OF LOCATIONAL INTELLIGENCE

Room: 301

Organizers: Murray Rice, University of North Texas and Tony Hernandez, Ryerson University, Canada

Chair: Murray Rice, University of North Texas

### **Panelists:**

Tony Hernandez, Ryerson University, Canada

Joseph Kerski, ESRI, Inc.

Lawrence Joseph, West Marine

Grant Thrall, Business Geography Advisors

Larry Carlson, Carlson & Associates

Wes Stroh, Directions Magazine

## GEOGRAPHY OF AGRICULTURE

Room: 302

Chair: Chris Laingen, Eastern Illinois University

### **The Spatial Distribution of the Genetic Trait Dispersal Patterns of the Friesian Horse in North America**

Andres Miller, Florida Atlantic University

### **Examining Sugarcane Farming in Belize with Community GIS and Mobile Mapping**

Heather Brisse, Georgia State University, Denver Cayetano, University of Belize,

Jessamyn Ramos and Gregorio Canto, Belize Sugarcane Industry Research and

Development Institute, Davette Gadison and Karim Minkara, Georgia State University,

Jani Salazar and Devon Saldano, University of Belize

**Food vs. Fuel: A Geographic Exploration of Agricultural Lands Devoted to Biofuel Production**

Kyle C. Flynn, University of Arkansas-Fort Smith

**Measuring Cropland Change: A Cautionary Tale**

Chris Laingen, Eastern Illinois University

**LAND USE/LAND COVER CHANGES**

Room: 303

Chair: Paporn Thebpanya, Towson University

**Assessing Nutrient Loading in the Headwater Streams of the Juniata River Watershed**

Tim Dolney and Lisa Emili, Pennsylvania State University - Altoona College

**Using Remote Sensing and GIS to Study Urban, Suburban, and Land-cover Change in Alachua County, Florida from 1993 to 2003**

Muhammad Almatar, Kuwait University, Kuwait

**Visualizing Land Use Changes Based on Historic Images of Brevard County, Florida**

Marnie Sippel, Pennsylvania State University

**Urban Sprawl and the Loss of Peri-Urban Land: Case Study of Nakhon Ratchasima Province, Thailand**

Paporn Thebpanya and Istiak Bhuyan, Towson University

**PHYSICAL GEOGRAPHY II: LANDFORM**

Room: 304

Chair: Emariana Widner, Kent State University

**Water Quality Estimation Using Combined Water Chemistry, Field Spectroscopy in the Shenandoah River, Virginia**

Mbongowo J. Mbuh, Paul R. Houser, Ron Resmini, and Ako Heidari, George Mason University

**Mapping Patterns of Marine Debris on Caye Caulker, Belize**

Ashton L. Brasher, Melissa J. Maher, Nathan M. Rabideaux, Timothy L. Hawthorne, and Christy C. Visaggi, Georgia State University

**Cave Density of the Greenbrier Limestone Group, West Virginia**

Lee Stocks, Jr. and Andrew Shears, Mansfield University

**Changes in Landscape Structure and Habitat Connectivity in Cleveland, Ohio**

Emariana Widner, Kent State University

**GEOSPATIAL ANALYSIS II**

Room: 305

Chair: Xinyue Ye, Kent State University

**Horizontal Accuracy Assessment of Global Positioning System Data from Common Smartphones**

Tyler W. Jones, Luke Marzen, and Art Chappelka, Auburn University

**We Know Where You Are - In Place: enrich the Geographical Context of Social Media**

Xining Yang, Ohio State University, Xinyue Ye, Kent State University, and Daniel Z. Sui, Ohio State University

**Functionality and Usability Evaluation of Web GIS in Academic Libraries**

Nicole Kong, Tao Zhang, Ilana Stonebraker, Purdue University

**Geography of Social Media: A Look at the Geographic and Temporal Trends of the April 2nd Shooting Incident at Kent State University**

Xinyue Ye, Jay Lee, Kent State University, Xiannian Li, West Virginia University, Huanyang Zhao, Kent State University, and Weihua Yi, Guangzhou Academy of Science, Guanzhou, China

**Siting Carbon Conversion Energy Facilities with Spatial Multi-Criteria Decision Analysis**

Jeffrey D. Hamerlinck, University of Wyoming and Scott N. Lieske, University of the Sunshine Coast, Australia

**POSTER SESSION**

8:30 AM – 5:00 PM

**Socioeconomic Inequalities of Childhood Obesity and Food Environments**

Yingru Li and Leah E. Robinson, Auburn University

**Visualizing Roman History: Coin Hoards on the Frontier of Britain**

Marvin Susott, Indiana State University

**Serving and Working with Diverse Communities through the Atlanta Community Mapping and Research Center**

Timothy Hawthorne, Georgia State University

**Community Geography as a Model for International Research Experiences in Study Abroad Programs: A Case Study of Belize**

Timothy Hawthorne, Georgia State University

**Food vs. Fuel: A Geographic Exploration of Agricultural Lands Devoted to Biofuel Production**

Kyle C. Flynn, University of Arkansas-Fort Smith

**Estimation of Water Quality Degradation Using Landscape Intensity Index in Kpk, Pakistan**

M. Sanaullah, University of Panjab, M. A. Malik, Pakistan Council of Research in Water Resources, Islamabad, and S. R. Ahmad, University of Punjab, Lahore, Pakistan

**Geospatial Analysis of Nitrogen Removal by Riparian Buffers in the Christina River Basin**

Thomas Santangelo and Luc Claessens, University of Delaware

7:00 PM – 8:00 PM

AGC Board of Directors Meeting

Room: 302

FRIDAY, OCTOBER 17, 2014

Sessions G: 8:30 AM – 10:00 AM

## CENSUS DATA DISSEMINATION AND ADDRESS VALIDATION

Room: 301

Organizer and Chair: Michael Ratcliffe, US Census Bureau

### Challenges for Data Dissemination: Small Geographic Areas and Statistical Grids

Vincent Osier, US Census Bureau

### Taking Advantage of the Improved Availability of Census Data: A First Look at the Gridded Population of the World, Version 4

Erin Doxsey-Whitfield, US Census Bureau

### Methodologies to Support a Reengineered Address Canvassing for the 2020 Census

Michael Ratcliffe, US Census Bureau

## ADDRESSING HEALTH CONCERNS

Room: 302

Chair: Dawna Cerney, Youngstown State University

### Acceptability and Use of Medicinal Plants as Complementary/Alternative to Orthodox Healthcare in Ghana

Sparkler Brefo Samar, CSIR-Forestry Research Institute of Ghana, Cornelius Frimpong, Divine Odame Appiah, KNUST, Kumasi, Gloria D. Djagbletey, Emmanuel Asiedu-Opoku, CSIR-Forestry Research Institute of Ghana, Godfred A. Gyasi, Alfred C. K. Akondoh, KNUST, Kumasi, Ghana

### Application of GIS as A Fundamental Tool in Polio Eradication in Nigeria

Oluwaseun Egbinola, eHealth Africa and University of Ibadan, Ibadan, Nigeria

### Characterization of Atmospheric Saharan Dust Plumes Using Remote Hyperspectral Imagery for Public Health

Kyle Mattingly, Bradford Johnson, and Al Fischer, the University of Georgia

### Impact of Natural Processes and Human Activities on Groundwater Quality in Negombo-Muthurajawela Region in Sri Lanka C. M.

Kanchana N. K. Chandrasekara, University of Colombo, Sri Lanka, K. D. N. Weerasinghe, University of Ruhuna, Sri Lanka, Sumith Pathirana, Qatar University, Qatar, and Ranjana U. K. Piyadasal, Southern Cross University, Australia

## INFRASTRUCTURE AND GREENSPACE ACCESS

Room: 303

Chair: Chris Laingen, Eastern Illinois University

**Political Geography of Infrastructure Access in Nigeria: Evidence from Spatial Data:  
Analysis of Infrastructure Access Across Government Areas**

Belinda Archibong, Columbia University

**Measuring Residential Greenspace Access in A Rurally-Situated Urban Area: An  
Object-Based Data Fusion Approach**

John Dees and J. B. Sharma, University of North Georgia

**Mobile Mapping and Public Participation to Understand Urban Greenspace  
Accessibility in Atlanta**

Rachel Luu, Georgia State University, Christine Munisteri, Skidmore College, Leah Rogstad, University of Vermont, Emily Christenson, University of Wisconsin-Eau Claire, and Timothy Hawthorne, Georgia State University

**Empirical Examination of Neighborhood Context of Individual Travel Behaviors**

Changjoo Kim, University of Cincinnati, and Jiyeong Lee, The University of Seoul, Seoul, South Korea

**CYCLONIC STORMS**

Room: 304

Chair: Todd Moore, Towson University

**Using Analogues to Simulate Changes in Alberta Clipper Trajectories with Global  
Climate Change**

Jamie Ward, University of Michigan

**The Relationship between the Madden-Julian Oscillation and Tropical Cyclone  
Tornado Clusters**

Richard W. Dixon, Texas State University and Todd W. Moore, Towson University

**A GIS Analysis of Hurricane Ivan's (2004) Tornado Clusters**

Todd W. Moore, Towson University, and Richard W. Dixon, Texas State University

**The Paleohurricane Record from the Georgia Coast**

Lawrence Kiage, Georgia State University

Sessions H: 10:30 AM – 12:00 PM

**ADAPTIVE REAL ESTATE STRATEGIES TO FACILITATE NEIGHBORHOOD-  
ORIENTED RETAILING**

Room: 301

Organizer and Chair: Tom Dwyer, BBCN Bank, Los Angeles

Panelists:

Tom Dwyer, BBCN Bank

Kevin Kiepert, Meijer, Inc.

## **BIRTH AND WEIGHTS**

Room: 302

Chair: Wei Tu, Georgia Southern University

### **Examining Spatially Varying Relationships between Preterm Births and Socioeconomic, Environmental, and Behavioral Factors Using Geographically Weighted Logistic Regression**

Jun Tu, Kennesaw State University

### **Socioeconomic Disparities, Physical Activity Environments, and Childhood Obesity in Alabama's Black Belt Region**

Mitch Carter, Yingru Li, and Leah E. Robinson, Auburn University

### **Multilevel Built Environment Features and Individual Odds of Overweight and Obesity in Utah**

Yangqing Xu, Louisiana State University, Ming Wen, University of Utah, and Fahui Wang, Louisiana State University and Yunnan University of Finance and Economics, China

### **Regional and Racial Disparity of Preterm Birth Prevalence in Georgia, 1995-2012**

Scott Markley and Wei Tu, Georgia Southern University

### **Geographic Patterns of High Preterm Birth Clusters in Georgia, 1995 to 2012**

Wei Tu, Thomas Rich, and Scott Markley, Georgia Southern University

## **URBAN AND REGIONAL VARIATIONS**

Room: 303

Chair: Bin Zhou, Southern Illinois University Edwardsville

### **New Center-Periphery Differentiation: Urban Residential Spatial Restructuring of Different Classes in Chengdu, China**

Qingmin Meng, Mississippi State University and Yongchun Yang, Lanzhou University, China

### **The Geographical Concentration of Wealth and Poverty: A Comparison Study of Edwardsville-Glen Carbon and East St. Louis, Illinois**

Wendy Shaw and Bin Zhou, Southern Illinois University Edwardsville

### **Applied GIS and Spatial Analysis Application in Regional Visioning Exercises**

John R. Lombard and George McLeaod, Old Dominion University, and Sara Kidd, Hampton Roads Planning District Commission, Chesapeake, Virginia

### **Weak Foundations: The Failure of Equilibrium-Based Population Growth forecasts**

William Graves and Jonathan Kozar, University of North Carolina Charlotte

## AIR QUALITY, WEATHER, CLIMATE, AND HEALTH

Room: 304

Chair: Mark L. Hildebrandt, Southern Illinois University Edwardsville

### Spatiotemporal Analysis of Climate Variability Impact on Malaria Prevalence in Ghana

Samuel Adu-Prah, Sam Houston State University and Emmanuel Kofi Tetteh, University of Ghana

### Visualizing and Analyzing Community-Based Air Quality Sampling Results Using Geospatial Technology and Online Toxics Release Inventory (TRI) Data

David A. Padgett, Tennessee State University

### The Role of Point Source Aerosol Emission on Atmospheric Convective Activity in the Vicinity of Power Plants in Georgia, USA

Neil Debbage, Jordan McLeod, Jared Rackley, Linli Zhu, Thomas L. Mote, and Andrew J. Grundstein, University of Georgia

### An Analysis of Air Masses Associated with Federal Ozone Exceedances across St. Louis, Missouri: 1990-2000

Mark L. Hildebrandt, Southern Illinois University Edwardsville

## CULTURE AND THINKING: MILITARY, THINKING, AND EDUCATION

Room: 305

Chair: Jay L. Newberry, Binghamton University

### Personnel Terrain: The Geography of Military Personnel Management

Fraser Moffatt, Department of National Defence, Canada

### Culture, Psychological Process, and Geospatial Thinking

Kanika Verma, Texas State University

### Expanding Cultural Geography Discourse: Communities and Definitions of Philanthropy in South Africa and Mozambique

Beth Oppenheim, University of Cape Town, Cape Town, South Africa

### Civil Rights Rhetoric in Michigan: Minority Enrollment Trends in Institutes of Higher Education, 1992-2012

Jay L. Newberry, Binghamton University

12:30 PM – 2:30 PM

## Luncheon

Room: Crystal Ballroom

Dr. Risa Palm, Provost, Georgia State University

Applied Geography from the Perspective of the University Administrator

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**The 37<sup>th</sup> Applied Geography Conference**

October 15-17, 2014

Atlanta, Georgia

**Presentation Abstracts**



## A GEOGRAPHIC PERSPECTIVE ON THE WALMART NEIGHBORHOOD MARKET

Lawrence Joseph ([lgjoseph@asu.edu](mailto:lgjoseph@asu.edu)), School of Geography, Arizona State University

### Abstract

Walmart has reached a stage of domestic real estate maturity, where it can no longer open new stores without significant cannibalization of existing stores. In order to continue growing, Walmart has entered international markets and invested in e-commerce. Still, deployment of brick and mortar stores in the US continues to remain part of its growth strategy. Realizing the pool of potential candidate sites for new supercenters would eventually dwindle, Walmart introduced its first Neighborhood Market in 1998 to serve quick-trip needs. After fifteen years, Walmart had over 300 Neighborhood Markets. With a limited amount of available and relevant sites to place new supercenters, and with negative same-store sales, Walmart announced it would significantly accelerate the rollout of the Neighborhood Market by opening approximately 200 new stores in 2014. This article investigates the spatial growth and trade area characteristics of the Neighborhood Market, and how it differentiates from traditional Walmart stores.

## A GIS ANALYSIS OF HURRICANE IVAN'S (2004) TORNADO CLUSTERS

Todd W. Moore ([tmoores@towson.edu](mailto:tmoores@towson.edu)), Department of Geography and Environmental Planning, Towson University, Towson, MD 21252

Richard W. Dixon ([rd11@txstate.edu](mailto:rd11@txstate.edu)), Department of Geography, Texas State University-San Marcos, San Marcos, TX 78666

### Abstract

Tropical cyclones often produce tornadoes before, during, and after their landfall. Some tropical cyclones have produced no tornadoes, or only a few, whereas others have produced over 100. Hurricane Ivan (2004) has produced more tornadoes than any other tropical cyclone that has impacted the United States. Ivan produced 118 tornadoes over a three day period from Florida north through Pennsylvania. These tornadoes were not produced uniformly across space and time, but rather occurred in spatio-temporal clusters. The purpose of this study is to explore the nature of Ivan's tornado clusters using GIS.

**Key words:** Hurricane Ivan, tornadoes, spatio-temporal clustering

## A NOTE ON ECONOMIC CONCERNS ARISING FROM THE DROUGHT CONDITIONS IN CALIFORNIA

William Roth ([wmroth@eiu.edu](mailto:wmroth@eiu.edu)), Indiana State University, Terre Haute, IN 47809

Cameron Douglas Craig ([cdcraig@eiu.edu](mailto:cdcraig@eiu.edu)), Department of Geology/Geography, Eastern Illinois University, Charleston, IL 61920

### Abstract

On the 17<sup>th</sup> of January 2014, due to water shortfalls and sub-average snowpack readings, Governor Edmund Brown Jr. proclaimed a State of Emergency for the State of California. Because of this deterioration of the water supply in the northern part of California, the Central Valley Project is unable to take water from the northern half of the state and pump it down to

the farmers in the Central Valley, as it usually does every year. Because of this, many farmers have found themselves unable to conduct their operations.

Communities in the Central Valley, specifically the San Joaquin Valley, are largely dependent on agriculture as a source of income and employment. For them, what is the impact of this drought? This paper seeks to highlight areas of concern for the inhabitants of the San Joaquin Valley (SJV); specifically in agricultural output, agricultural jobs, energy, and the external effects of drought conditions. All of these are subject to some amount of influence by the reduction in water resources. By examining these areas we provide an economic context for the onset and continuation of these drought conditions for the inhabitants of the SJV.

**Key words:** drought, economics, agriculture, San Joaquin Valley, Central Valley California

## A SPATIO-TEMPORAL ANALYSIS OF HOTEL LOCATIONS IN MANHATTAN, NEW YORK CITY

Ting Du ([tzd0014@tigermail.auburn.edu](mailto:tzd0014@tigermail.auburn.edu)) and Yingru Li, Department of Geology & Geography, Auburn University

### Abstract

Location is one of the most influential factors in hotel investment decision making. This study investigates the locations of hotels in Manhattan, New York City, for the purposes of: (1) to analyze spatial-temporal variations of hotel development in Manhattan from 1822 to 2012; (2) to provide feasible measurements to assess and quantify the relevant locations factors influencing hotel performance; (3) to examine and identify the potential location factors significant to location decision making and performance of hotel. GIS-based spatial statistical methods are applied to detect spatial-temporal patterns of hotel location distribution over different time periods. Multiple regressions are used to examine the relationships between location factors and star level, room number, and performance. The results illustrate and assess the sensitivity of location factors in impacting hotel location decision making and operation, also provide references for retailers and planners.

**Key words:** Hotel location, GIS, Spatial statistics, New York City

## ASPATIO-TEMPORAL ANALYSIS OF HURRICANE IVAN'S (2004) TORNADO CLUSTERS

Todd W. Moore ([tmoore@towson.edu](mailto:tmoore@towson.edu)), Department of Geography and Environmental Planning, Towson University, Towson, MD 21252

Richard W. Dixon ([rd11@txstate.edu](mailto:rd11@txstate.edu)), Department of Geography, Texas State University-San Marcos, San Marcos, TX 78666

### Abstract

Tropical cyclones often produce tornadoes before, during, and after their landfall. Some tropical cyclones have produced no tornadoes, or only a few, whereas others have produced over 100. Hurricane Ivan (2004) has produced more tornadoes than any other tropical cyclone that has impacted the United States. Ivan produced 118 tornadoes over a three day period from Florida north through Pennsylvania. These tornadoes were not produced uniformly across space and time, but rather occurred in spatio-temporal clusters. The purpose of this study is to explore the nature of Ivan's tornado clusters using GIS.

**Key words:** Hurricane Ivan, tornadoes, spatio-temporal clustering

## A TAXONOMIC ANALYSIS OF PERSPECTIVES IN GENERATING SPACE-TIME RESEARCH QUESTIONS IN ENVIRONMENTAL SCIENCES

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### Abstract

Research questions in environment science can be decomposed into three basic dimensions: space, time and statistics. The combinations of these three dimensions reflect the diverse perspectives that look at observations across multiple scales. We can classify the scales in each of these three dimensions into four types: individual, local, meso, and global. Following this multi-dimensional and multi-scale framework, this paper conducts a taxonomic analysis that systematically classifies research questions in environmental science. The articles included in this taxonomic analysis are selected from the papers of Stochastic Environmental Research and Risk Assessment (SERRA) published in 2012. The results show that the majority of research questions are directed at local-scale and global-scale analyses. Studies that incorporate many scales of analysis are not necessarily sophisticated than studies that investigate a single scale. Nonetheless, it's beneficial to explore more possibilities in investigating data at different perspectives. This taxonomy could help generating the research questions, and provide guidance for building analytic workflow systems to fill the gaps in future scientific endeavors.

**Key Words** Environmental science · Research questions · Scale · Space-time · Taxonomic analysis

## ACCEPTABILITY AND USE OF MEDICINAL PLANTS AS COMPLEMENTARY/ALTERNATIVE TO ORTHODOX HEALTHCARE IN GHANA

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### Abstract

The World Health Organization's Health For All agenda remains far from fruition in Ghana. This is due to inadequate finance and personnel among others to support the mainstream orthodox healthcare system. The World Health Organization (WHO) encourages the development and utilization of traditional medicine in the Primary Health Care delivery in developing countries. This policy is based on the sound recognition of the role that traditional medicine plays in health care programs in most developing countries. The study investigates the acceptability of Medicinal Plants as a complementary/alternative to the orthodox healthcare system. The cross-sectional survey deployed a triangulation approach to solicit data from a sample of 156, involving 114 community members and 39 herbalists across three geographical settings *viz.* Kumasi Metropolis (Urban), Mampong Municipality (Peri-Urban) and Nkoranzah North District (Rural). Instruments for the survey included two sets of partially pre-coded questionnaires. The study revealed an acceptance level of 97.4% for Medicinal Plants as a source of healthcare with the potential to complement the orthodox healthcare system. Residency (urban, peri-urban and rural) showed no statistically significant association with the acceptability of Medicinal Plant ( $p = 0.224$ ). The high acceptability of Medicinal Plants was mainly due to efficacy (Very high = 79.8%, High = 17.5%); affordability (Very high = 40.4%, High = 42.1%) and its natural origin (Very high = 17.5%, High = 66.7%); availability (Very high = 26.3%, High = 52.6%); accessibility (Very high = 37.7%, High = 48.2%). Policy direction should be aimed at securing the resource base of Medicinal Plants to enhance its availability, affordability and accessibility.

**Key Words:** acceptability, medicinal plants , orthodox healthcare

## ADAPTIVE REAL ESTATE STRATEGIES TO FACILITATE NEIGHBORHOOD-ORIENTED RETAILING

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### Abstract

Many long-established high density urban neighborhoods throughout the United States are chronically underserved with neighborhood-oriented retail establishments, and supermarkets in particular. In urban areas the difficulty is typically associated with real estate-related challenges, including the inability to assemble sufficient land, competing higher yielding uses, lack of parking, and high property tax burden. In suburban and fringe areas underserved by supermarkets, lack of sufficient threshold population density is often the key contributor, but real estate taxes can also play a significant role.

A variety of strategies have been implemented by the private, public, and even non-profit sectors to surmount the challenges of bringing supermarket and other neighborhood-oriented retailing to underserved markets. We explore these challenges through case studies that provide specific examples in several metropolitan areas, including Atlanta, Chicago, Detroit, Los Angeles, and New York City. Examples of how excessive commercial property taxes can push a property into distress will be presented, as will examples of how targeted real estate tax abatements helped bring supermarkets to underserved urban neighborhoods. Another urban strategy we examine involves establishing the supermarket as a mostly self-sustaining nonprofit organization. An example from a suburban fringe location demonstrates how adding an ethnic element to the supermarket orientation expands draw beyond traditional neighborhood trade area boundaries, thereby increasing sales and the viability of the store.

Neighborhood-focused retail locations offer a unique set of challenges due to their proximity to households, which often removes them from main thoroughfares and makes them unsuitable as locations for many retailers. Additional insights on real estate dynamics of neighborhood-oriented locations are gleaned from an examination of the subsequent uses of Michigan stores that were formerly tenanted by the now defunct Farmer Jack supermarket chain.

**Key words:** supermarkets, real estate, underserved neighborhoods, retail, real estate tax

## ADDRESSING FUNCTIONAL MAP ILLITERACY IN COMMUNITY COLLEGE STUDENTS

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### Abstract

The current cohort of young community college students are increasingly functionally map illiterate. Many have never created their own map, or consulted a road atlas or paper map in order to navigate to their desired destination, or help others to do so. Thanks to GPS, not only are many unable to do this, but feel they do not *need* the skills to do this. The growing reliance upon GPS, the declining ability to understand and use maps in daily life, and the declining importance students place on functional map literacy is a legitimate concern.

GPS is a wonderful tool for exposing students to their world, but it has its pitfalls. Complete reliance upon technology instills a false sense of infallibility, and makes obsolete the cognitive map-making process facilitated by traditional navigation activities. Lacking the internal representations of the experienced world that are cognitive (mental) maps makes it difficult for educators to instill awareness of the geographical world.

Functional map illiteracy needs to be addressed. The paper concludes with several specific pedagogic activities designed to induce community college students to lay aside their GPS, challenge them to create cognitive maps, and learn some basic functional map literacy skills.

**Key words:** functional map literacy, functional map literacy skills, GPS, cognitive maps

## AN ANALYSIS OF AIR MASSES ASSOCIATED WITH FEDERAL OZONE EXCEEDANCES ACROSS ST. LOUIS, MISSOURI: 2000-2010

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### Abstract

The St. Louis, Missouri metropolitan region has a history of poor air quality. While some studies have examined the surface and atmospheric conditions associated with Federal ozone exceedances across St. Louis, little research has been done on the air mass types associated with ozone exceedances in this region. The research is a first step in that direction.

Days with ozone exceedances from 2000-2010 were classified according to the accompanying air mass type that dominated the region on each of those days. This study found that over 70 percent of ozone exceedances occurred on days with maritime tropical air masses, while over 20 percent occurred on days with dry tropical masses. Exceedances also occurred

with dry moderate air masses in the region. It is hoped that recognizing air masses associated with ozone exceedances will allow us to better alert the residents of these dangerous events.

**Key words:** ozone, St. Louis, applied climatology

## AN ANALYSIS OF AIR MASSES ASSOCIATED WITH FEDERAL OZONE EXCEEDANCES ACROSS ST. LOUIS, MISSOURI: 1990-2000

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### Abstract

The St. Louis, Missouri metropolitan region has a history of poor air quality. While some studies have examined the surface and atmospheric conditions associated with Federal ozone exceedances across St. Louis, little research has been done on the air mass types associated with ozone exceedances in this region. The research is a first step in that direction.

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**Key Words:** ozone, St. Louis, applied climatology

## AN APPLICATION OF THE PRESSURE AND RELEASE MODEL IN GADSDEN COUNTY, FLORIDA

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### Abstract

Gadsden County, Florida is in a state of disaster. Poverty is high, education is lacking, and the workforce is dwindling. The current state of Gadsden County could possibly be attributed to the growth and sudden death of shade tobacco. A population was made vulnerable by what is usually great, a rapidly growing industry. I will examine the situation by applying the Pressure and Release Model to Gadsden County. While the model is typically used to assess vulnerability in cases of natural hazards and disasters, I will use it to examine an economic disaster. My hope is that by applying the Pressure and Release Model I will be able to identify a new use for the model. More specifically I hope that this method can be used in the future to identify populations made vulnerable by growing industries so that those vulnerabilities can be addressed before it is too late.

**Key words:** social vulnerability, resilience, economic disaster, tobacco industry

## ANALYSIS OF CURRENT DROUGHT IN TEXAS COMPARED TO THE DROUGHT OF RECORD

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### Abstract

The current drought in Texas has become the second worst in the last 120 years exceeded only by the 1950s drought of record. While it is easy to compare the two in terms of area, length and severity using the Palmer Drought Severity index (PDSI), the underlying atmospheric process can be reconstructed with data from NOAA's reanalysis model. Reanalysis is a comprehensive, global data set produced by the National Centers for Environmental Prediction. The historical surface observations, balloon soundings and satellite data have been reprocessed or reanalyzed with a sophisticated computer model. Thus, it is possible to compare the 1950s drought and the current drought directly using data from the same model. The meteorological processes operating in these droughts showed similar patterns of 500 mb pressure, outgoing longwave radiation and geopotential height.

## ANALYZING CROSS-MARKET BRANCH BANKING NETWORK STRUCTURE USING OVERLAPPING COMMUNITIES: THE CASE OF ILLINOIS

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### Abstract

This paper investigates the structure of the cross-market branch banking network in Illinois by detecting overlapping communities within the network. Within a cross-market branch banking network, there may be sub-networks where different markets develop dense connections, which help diversify finances and hedge against financial risks. These types of connections are consistent with the concept of the clique. This study uses the clique percolation method to detect cliques and/or communities of cliques in a network. An advantage of the method is to identify overlapping communities in which a market may belong to different communities. An additional advantage of the method is to simplify and “coarse-grain” a complex network in order to reveal the core structure and essential topology of a network. The study investigates Illinois cross-market branch banking networks for both 1994 and 2011 in order to contrast the significant changes in cross-market branch banking network structure that took place during the intervening years.

**Key Words:** branch banking network, overlapping community, social network analysis

## ANALYZING THE SPATIAL PATTERN OF PRIMARY CARE PHYSICIAN LOCATIONS IN HILLSBOROUGH COUNTY, FLORIDA

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## Abstract

Primary care is the key element within the health care delivery system in the United States. Primary care provides initial treatments for patients and refers them to specialists if the patients need advanced cares. However, there is an overall shortage of primary care physicians (PCPs) across the country and its spatial disparity at different geographic scales is prominent, highlighting a major challenge for public health. Thus, it is important to examine the factors that affect PCPs distribution and understand the dynamic spatial patterns of PCPs.

Two factors linked to health disparity – poverty and racial composition, have been greatly explored in health literature, concerning their significant correlations to individual health status. However, less has been done on exploring their contribution to the supply side of health care, such as the spatial distribution of PCPs at a local geographical scale. Theoretically, PCPs should be evenly distributed across space according to the demand of patients. However, some socio-economic factors may affect the spatial pattern of PCPs locations resulting in spatial disparity between demand and supply. In this paper, we provide a set of spatial statistical models to assess the disparity and identify crucial factors such as poverty, racial composition, insurance rate and others with the case study of Hillsborough County, Florida.

Hillsborough County, Florida is known for being one of the largest counties in the United States. It has a racially diverse population and over 3,000 registered PCPs. In this study, the geographical locations of PCPs were geocoded using active PCPs' practice addresses data in 2010. The analysis consists of two steps. First, to examine the spatial patterns of PCPs distributions, we applied both global Moran's I and LISA statistics. Second, to assess crucial factors that might influence PCPs distribution at a local level, both spatial lag and spatial error regression models were applied, since there was spatial dependency in both PCPs locations and regression residuals. Other than blacks and whites, two ethnic groups that were generally ignored in previous studies– Hispanics and Asians, were included in the analysis. The results provide a detailed local examination of the influence of poverty and racial composition on PCPs distribution patterns, especially the significant impacts of Asians and insurance rate in this specific area. This shall be useful reference for local health planners or government decision makers when allocating resources in primary care in the future.

**Key words:** health disparity, primary care physician (PCP)

## APPLICATION OF A DIAGNOSTIC SOIL MOISTURE EQUATION FOR ESTIMATING ROOT-ZONE SOIL MOISTURE IN ARID AND SEMI-ARID REGIONS

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## Abstract

Soil moisture in the root zone is critical for seed germination and crop growth especially during the early stage of the plant growth, and thus root-zone soil moisture is one of key variables for crop growth estimation, irrigation scheduling, and crop yield prediction and modeling. In this study, the soil moisture diagnostic equation was applied to estimate root-zone (0~100cm) soil moisture at four USDA Soil Climate Analysis Network (SCAN) sites in arid and semi-arid regions: TX2105 in northwest Texas, NM2015 and NM 2108 in east New Mexico, and AZ2026

in southeast Arizona. At each site, a 5-year data set of daily soil moisture and daily precipitation is compiled and processed. The first four years data are used to derive the soil moisture loss function and the empirical constants in the soil moisture diagnostic equation. The derived loss function and empirical constants are then applied to estimate soil moisture in the last year at each site. Root mean square errors (RMSEs) of the estimated volumetric soil moistures in five different soil columns (i.e., 5cm, 10cm, 20 or 30cm, 50cm, and 100cm) are less than 4.0 (%V/V) and all coefficients of determination ( $r^2$ ) are greater than 0.5. The method and results presented in this study demonstrate that the soil moisture diagnostic equation has the ability to estimate not only surface soil moisture, but also the entire root-zone soil moisture from precipitation.

**Key Words:** soil moisture, precipitation, soil moisture diagnostic equation, soil moisture loss function

## APPLICATION OF GIS AS A FUNDAMENTAL TOOL IN POLIO ERADICATION IN NIGERIA

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### Abstract

Nigeria is one of the most entrenched reservoirs of wild polio virus in the world. It accounts for 55% of the global cases and is the only country in the world affected by transmission of all three serotypes: WPV1, WPV3 and an on-going circulating vaccine-derived poliovirus type 2. The world looks towards the eradication of polio in Nigeria as the gateway to its extermination in Africa and the rest of the world. More recently, the World Health Organization (WHO) has declared the spread of polio as an international public health emergency. Several problems have been encountered in the past in the quest to eradicate polio in Nigeria and notable of such is the persistent refusal to receive vaccines, child absence, missed children and finally the issue of missed settlements during vaccination campaigns.

Recent applications of GIS techniques in polio eradication in Nigeria has made it possible to address the issue of missed settlements during vaccination campaigns through the GPS Tracking System aimed at tracking vaccination teams with the overall aim of identifying missed settlements during vaccination campaigns. Furthermore, the application of GIS technology has also made it possible to develop high quality GIS maps at the ward level which has aided significantly in the drawing of microplans for polio eradication and to delineate border settlements with an attempt at border synchronization. Finally, application of GIS has also aided routine immunization delivery by creating 2km buffers around each healthcare facility with the aim of determining which settlements have little or no access to routine immunization services thus aiding healthcare allocation planning.

This paper will provide an in-depth analysis of the application of GIS techniques as a fundamental tool in polio eradication in Nigeria. The challenges being encountered in the deployment of GIS tools and techniques will also be examined.

**Key Words:** GIS, Vaccination Campaigns, Polio Eradication

## APPLIED GIS AND SPATIAL ANALYSIS APPLICATION IN REGIONAL VISIONING EXERCISES

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### Abstract

Regional visioning is popular method where regional leaders convene to discuss and map regional growth scenarios as a prelude to an ongoing effort to address land use planning scenarios in a transparent and apolitical framework. In Hampton Roads VA a regional visioning exercise convened more than 300 participants to chart forecasted population growth on regional land use maps using different color LEGOS to represent housing and employment growth. This paper sheds light on how geographers using GIS and applied spatial analyses developed a methodology to capture the spatial elements of each group's final map depicting what Hampton Roads will look like in the future. The paper concludes with a critical assessment of the importance of applied spatial analysis and geographical information systems in facilitating regional visioning.

## ASSESSING BOX-STORE LOCATION: IMPLICATIONS OF THE INNER CITY AND STORE TYPE

Brian Ceh ([bceh@ryerson.ca](mailto:bceh@ryerson.ca)), Kressell Daniel, & Tony Hernandez, Ryerson University, Toronto, Canada

### Abstract

The socio-economic implications that box-stores have on inner city locations is not nearly as well understood compared to that in suburban and rural areas. Much of the reason for this has been a reluctance by retail giants to readily situate box-stores in the inner city, particularly during the 1990s and 2000s. This study examines the outcome of a Wal-Mart location (called Dufferin Wal-Mart) on an inner city location in Toronto, Canada. What makes the study particularly interesting is that we examine the outcomes of this one particular store location before and after it became a supercenter in 2010. When it was a Wal-Mart and now as a Super Wal-Mart. This study investigates the incremental effects of Dufferin Wal-Mart on its nearby community from 2006 to 2013. The composition of all retail establishments located within a 1.5 km radius of Dufferin Mall was first categorized into one of 15 major categories based on services and product offering. Analysis of the results revealed that there has been a decline in the number of competing retail establishments and an increase in the number of non-competing establishments. This is in spite of our earlier study that showed more substantive growth and benefits to the community. The findings underline the need to assess the impact of box stores by type, market, and urban context.

## ASSESSING IMPACTS OF URBAN EXPANSION ON COASTAL ECOSYSTEMS BASED ON DIFFERENT GROWTH SCENARIOS

Kang Shou Lu - Towson University  
Jeffery Allen – Clemson University

## Abstract

Urban expansion and associated land use change have complex impacts on ecosystems. Some of the impacts have not been felt or perceived as being severe right now, but they may become detrimental in the future if the trend continues. Predictive modeling allows us to anticipate if this is the case and to take a proactive action if necessary.

This study combines the products of simulated urban growth and USGS's GAP analysis to assess potential ecological impacts of future urban expansion on vegetation cover, habitats, and biodiversity. Five growth scenarios were used to implicitly simulate urban expansion from 2000 through 2030 at different growth rates, urbanization extents, and sprawl areas. As found in the Beaufort area in South Carolina, US, substantial losses of vegetation cover and habits areas for selected four species, particularly local common species even under the most conservative scenario. Although urban residential areas have a greater number of species than the average in all land areas, predicted continuous shrinking of the habits of enlisted endangered species is worth concern. While the approach and methods used here are applicable in other regions as a diagnostic tool for impact assessment, maps and tables generated are useful for visualizing spatiotemporal changes and for making decisions in land use planning and coastal ecosystem management.

**Key Words:** Ecological impact, urban expansion, gap analysis, geographic information system, land use modeling, neural network

## ASSESSING NUTRIENT LOADING IN HEAD WATER STREAMS OF THE JUNIATA RIVER WATERSHED

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## Abstract

As part of the National Pollutant Discharge Elimination System (NPDES) and Municipal Separate Storm Sewer (MS4) permits for the city of Altoona, Pennsylvania, water quality parameter concentrations have been measured in headwater streams in the Juniata River watershed. Dissolved oxygen, specific conductivity, pH, nitrate, phosphate, sulfate, total alkalinity, total dissolved solids and turbidity have been measured in-stream from 2011 until present. Our results indicate that stream water concentrations of the measured parameters, with the exception of phosphate, fall within the range recommended for the protection of freshwater aquatic life and human health. Mean concentrations of nitrates ( $1.01 \pm 0.93$  mg/L) and phosphates ( $1.2 \pm 1.6$  mg/L) exceed threshold concentrations for accelerated eutrophication, with ranges in concentrations from below detection limits to 4.90 mg/L and 14.1 mg/L for nitrates and phosphates, respectively. For effective management and for regulatory purposes, it is difficult to assess compliance based on concentration data alone. The determination of nutrient export coefficients provide a means of identifying and quantifying the sources and relative contributions of nutrient loading by land area in these sub-basins. We are using the MapShed-GWLF (Generalized Watershed Loading Function) watershed modeling tool to

estimate pollutant loadings, model sediment and nutrient transport and to assess the effects of best management practices.

**Key words:** nutrient loads, watershed, GIS

## ASSESSING THE IMPACT OF SCALE AND LOCATION TYPE ON RETAIL STORE CO-LOCATION: AN EXPLORATORY ANALYSIS

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### Abstract

The spatial distribution of retail activity has traditionally been defined by processes of economic agglomeration and associated store clustering. This paper uses a grid-based analysis at varying spatial scales to assess the co-location of retail stores with the Greater Toronto Area. Using data from the Centre for the Study of Commercial Activity (CSCA) the paper examines patterns of retail co-location in terms of both spatial scale and location type (mall, power centre and retail strip). Building on the work of Larsson and Oner (2014), pairwise correlations at varying spatial scales are compared to assess the co-location relationship of selected retail categories. The findings highlight which categories are most likely to co-locate and how this relationship is impacted by location type. The paper discusses the managerial implications in terms of store preference and tenant mix and identifies a number of areas for future research.

**Key Words:** retail location, store clustering, business mix

## ASSESSMENT OF FLOW PATTERNS OF CANCER PATIENTS TO TREATMENT CENTRE IN SOUTHWESTERN NIGERIA: A GIS APPROACH

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### Abstract

According to the National Cancer Society, 80% of cancer cases are curable if detected early. However, most cancer cases in Nigeria are detected in their late stages, which made them difficult to cure. This study analyses cancer occurrence and flow patterns of cancer patients to treatment centre as well as examine the challenges to cancer treatment in Nigeria. Handheld GPS receiver was used to obtain the geographic coordinates of Obafemi Awolowo University Teaching Hospital Cancer Treatment Centre (OAUTHCTC) and other relevant phenomena. Cancer occurrence data (2000-2010) obtained from cancer registry, Obafemi Awolowo University Teaching Hospital Ile-Ife, Nigeria.

IKONOS multispectral imagery (1.1m resolution) was used to ascertain the road network to the treatment centre. Questionnaires were administered to the medical personnel in the department of Morbid Anatomy and Histopathology, Medicine, General surgery and Obstetrics and Gynecology of Obafemi Awolowo University Teaching Hospital Complex (OAUTHC) to obtain information about the accessibility pattern of cancer patients, referral patterns and availability of medical facilities for diagnosis and treatment. GIS operations and analytical techniques applied includes; Inverse Distance Weighted (IDW), Querying among others with

ArcGIS 9.3. Data shows that 1809 cancer patients from the various 15 states of Nigeria patronized OAUTHC Cancer Treatment Centre in Ile-Ife with Osun state having the highest patronage with 50.6%, Ondo state with 23.2% as well as Ekiti state having 11.2% patronage while others states had low patronage patterns. Female patients had the highest patronage with 53.7% and 61.0% both in Nigeria and Osun state respectively.

The result of the Analysis of Variance (ANOVA) computed shows that there exist significant relationships between distance travelled by patients to receive treatment and the level of patronages both across Nigeria and in Osun state having ( $r=0.008, p=0.005$ ) and ( $r=0.015, p=0.005$ ). The study revealed that certain factors determines the flow patterns of cancer patients to treatment centre among which are the demographic characteristics of patients, socio-economic status, marital beliefs, level of education, social status as well as the distance travelled to receive treatment and recommends that cancer prevention effort should take into cognizance the rate of urbanization and awareness programmes for the citizenry.

#### ASSESSMENT OF STUDENT LEARNING BY STUDENTS IN HUMAN GEOGRAPHY AT YOUNGSTOWN STATE UNIVERSITY

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##### **Abstract**

Assessment is important in discerning student learning and achievement. Periodic exams and assignments throughout the semester provide opportunities to accumulate points used for assignment of grades. Pre- and post-tests as an assessment tool can be helpful in identifying concepts that students grasp while also identifying concepts that are more challenging to students. Additionally, this form of evaluation is a useful means of obtaining quantitative data regarding student learning and tests for consistency of content across multiple sections of a course.

This study was designed to answer the following research questions: 1. Overall did students perform better on post-tests at the completion of the course? 2. Can particular concepts be identified that test results indicate are difficult to comprehend? 3. Is it possible to identify particular concepts that students demonstrate increased proficiency at the completion of the course? Pre- and post-tests results for 128 students will be evaluated to identify the percentage of students who demonstrated an improved knowledge of course material over the course of the semester. The 7 face to face sections of Human Geography occurred over 3 semesters from spring 2013 through spring 2014 at Youngstown State University in Youngstown, Ohio. Responses will be evaluated to identify concepts which may require more review during lectures. Questions with a poor response will also be reviewed to identify poorly written questions. It will also be possible to compare results between semesters. Results of this study will be used to elucidate areas of improvement for the course.

**Key Words:** Assessment, pre- and post-tests

#### BACK FROM THE BRINK: SUSTAINING MONTANA'S WILDLIFE POPULATION THROUGH HUNTER EXPENDITURES

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## Abstract

Beginning with the gold rush era of the 1860s and culminating with the devastating droughts of the 1910s and 1930s, Montana's wildlife, and that of the entire nation, was in a perilous state and in need of a boost. This boost came from the introduction of the Federal Aid in Wildlife Restoration Act, or as it is commonly known, the Pittman-Robertson Act in 1937. The program is based on a self-imposed, and hunter-supported, manufacturers excise tax. These funds, in conjunction with funds generated through Montana hunting permits, have brought Montana's wildlife back from the brink of destruction. The objective of this study was to determine if a relationship between hunter-supported expenditures by Montana Fish, Wildlife and Parks existed with hunter participation numbers and harvest numbers. It was hypothesized that there existed a positive relationship between the amount of hunter-related expenditures, and the amount of hunter participation and harvest rates.

**Key Words:** Hunting, Recreation, Conservation, Montana, Pittman-Robertson Act

## BUILDING A LOW-COST GEOGRAPHIC WEB PORTAL FOR COLLECTING CITIZEN SCIENCE CONTRIBUTIONS

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## Abstract

In 2004, shortly after the introduction of Google Maps, Paul Rademacher created the first web mashup mapping housing data from Craigslist. Since then, web mapping has become ubiquitous on websites and mobile applications in many realms including social networking, collaborative mapping, and citizen science. During this time, web mapping technologies have developed rapidly. A wide variety of new software from both private vendors and open source collaborators has made the barrier to entry for web mapping platforms relatively easy. Using this technology can assist geography researchers to collect information from citizen scientists. In this project, we explore different low-cost, low-barrier options of web technologies for citizen science websites. Using this information, we created a website to collect volunteered information about low water crossing hazards perceptions in Central Texas.

Choosing the right combination of software to implement a geographic citizen science project requires understanding the basics behind web portals. Web mapping portals are built on a GeoStack, or the layers of database and storage, data server, imagery server, and viewer that allows seamless integration of web portal technologies. We present the most popular open source software choices for each GeoStack layer and a comparison of the features for these products.

For our project collecting low water crossing hazard information, we selected a combination of Wordpress blogging software and a Google Maps plugin called GeoMashup. The software allows users to submit possible low water crossings as point data in addition to descriptions and photos. Other users can comment and verify locations. A group of undergraduate students, some with GIS experience and some without, tested the software for usability. The results indicate that the software is easy to use for most students regardless of GIS experience. Using such a portal should allow applied geography researchers to work with citizen scientists to collect photos and information about a wide variety of geographic phenomena.

**Key Words:** Volunteered Geographic Information (VGI), citizen science, flood hazards, web portal, hazard perception, GeoStack

## BUILDING A PLATFORM FOR THE ANALYSIS OF GLOBAL SURFACE SUMMARY OF THE DAY WEATHER OBSERVATIONS

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### Abstract

Server, client, and cloud technologies are used to build a global weather observation analysis system. The prototype focuses on global surface summary of the day (GSOD) point weather observations; the system is built on an architecture which can be further extended to include other weather data (i.e., radar) and other geographic data.

The platform is mainly built on commercial products with the objective of being able to query, perform time series trend analysis graphing, create time-series interpolated surfaces, and apply time-aware rendering to the GSOD data. The GSOD stations can be examined individually, spatially aggregated by geographic areas (i.e. states), or spatially aggregated by latitude and/or longitude ranges. Temporal aggregation currently includes day, meteorological week, month, meteorological season, astronomical season, and year. Several examples will be presented from China and the United States. Exploratory integration and analysis of the GSOD weather observations with data from the North American Breeding Bird Survey (BBS) will also be presented.

**Key words:** global surface summary of the day, prototype display and analysis system

## CAVE DENSITY OF THE GREENBRIER LIMESTONE GROUP, WEST VIRGINIA

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### Abstract

The Greenbrier Limestone Group, known in West Virginia as the “Big Lime”, is an extensive, calcium-pure limestone unit of Mississippian Age (350-340 million years). Deposited in a shallow ocean basin during the Carboniferous, the Big Lime is over 1000 feet thick in the Greenbrier Valley of West Virginia. The wet climate of central Appalachia provides the hydraulics and corrosive carbonic acid action necessary to form frequent and sizeable karst dissolution features, such as caves, sinkholes, and springs. Some of the world’s largest caves form here as contact caves, where the Big Lime meets the underlying McCrady Shale Formation, including Scott Hollow Cave (29.5 miles), Organ Cave (38.5 miles), and The Hole (23 miles). Likewise, thousands of sinkholes and pits have formed via dissolution of bedrock and collapse into subsurface cave passage. These features create geohazards to infrastructure and provide pathways for aquifer contamination through sediment and pollutant transport, thereby requiring a geographic understanding of karst feature density.

This research utilizes the geographic and geologic analysis capabilities of ArcGIS 10 to examine spatial relationships between this stratigraphic unit and the development of karst features, in order to explore any structural or geographic controls on their genesis. Data is derived from the West Virginia Speleological Survey database of over 5600 caves and pits,

including length, depth, elevation, and stratigraphic unit attributes. Hexagonal bins with a variety of diameters were used for autocorrelational, Getis-Gi hot spot, and Getis-Ord high/low cluster analysis. Each of these tests showed statistically significant spatial relationships for cave sites at all levels of analysis.

**Key Words:** Karst, Caves, GIS, Cluster Analysis

## CHALLENGES FOR DATA DISSEMINATION: SMALL GEOGRAPHIC AREAS AND STATISTICAL GRIDS

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### Abstract

For the past year, the United Nations Committee of Experts on Global Geospatial Information management (UN-GGIM) has been working meet the challenges of managing and integrating geospatial and statistical information nationally and globally. UN-GGIM has been tasked with developing and advancing the implementation of a global statistical-geospatial framework as a standard for the integration of statistical and geospatial information. This paper compares the pros and cons of two different frameworks—namely statistics by administrative areas, and grid-based statistical areas—using examples from the United States and around the world. It presents informed observations and experiences of member countries as well as a summary of the future challenges and tasks ahead for statistical and international mapping organizations to accomplish the goals of UN-GGIM.

**Key Words:** Gridded Data, population, statistical geography

## CHANGE DETECTION BY MULTI-SEASON APPROACH

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### Abstract

The advent of satellite technology enhanced tracking of changes on earth. Images obtained from satellites are commonly used for assessing and mapping land cover and land cover changes. An accurate estimation of changes in our environment is helpful for both government and researchers to plan strategically towards the future and understand the dynamic nature of our planet. Such issues can be handled effectively through remote sensing applications, specifically using change detection techniques. Change detection is simply comparing two or more geographically identical, but temporally separate images to identify variation in land surface cover features (Wang and Xu, 2010). The approaches for change detection are varied. Nevertheless, most analysts prefer approaches like pre-classification and post-classification. In such instances, the credibility of the results depends essentially on the outcome of the classification. Common with these approaches is the use of images from a single season. However, this method is prone to several challenges especially when determining classes for land cover types; seasonal changes may deceive an analyst to incorrectly assign land cover classes. To limit such problems, some scholars have proposed the use of multi season data in place of single season (Petrov and Sugumaran, 2005). This study adopted this method to assess land cover changes in the San Marcos, Texas area between 1985 and 2010.

The results from the multi season matrix change detection approach proved efficient in both the land cover mapping and change detection analysis. The author used Landsat Images from two separate seasons (Spring and Fall) in the same year. Taking advantage of seasonal variations in the imagery, the approach helped reduce misclassification errors, thus, aided in creating a comparatively more accurate land cover map (average overall accuracy = 76%). This in turn influenced the outcome of the change detection (overall accuracy = 61%). Lastly, the approach proved efficient in revealing specific within-land cover class changes that occurred over the 25 year period.

**Key words:** Remote Sensing, Change Detection, Multi-Season Approach

## CHANGES IN LANDSCAPE STRUCTURE AND HABITAT CONNECTIVITY IN CLEVELAND, OHIO

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### Abstract

Urbanization is often maligned for its impacts on wildlife habitats, which are typically restricted to small remnant patches in parks, green spaces, and riparian corridors isolated within the urban matrix. The resulting fragmented habitat patchwork impacts biodiversity, animal movements, predation, and seed dispersal. Increasing the connectivity of these habitat fragments is an important aspect of sustaining and conserving urban biodiversity and reducing human/wildlife conflicts. Urban land prices and city politics typically reinforce this pattern of isolated habitat patches leaving city planners, ecologists, and wildlife managers few options to increase habitat connectivity and restore ecological flows. However, shrinking postindustrial cities, like Cleveland, OH, which have suffered population loss, residential, and urban decay and are looking toward a more sustainable future, present a unique opportunity to obtain land cheaply and redesign the urban landscape to increase ecological functionality. This work examines changes in wildlife habitat connectivity and landscape heterogeneity concurrent with population loss using landscape metrics derived from satellite imagery analysis in and around Cleveland, OH.

**Key words:** urban ecology, landscape ecology, habitat connectivity, wildlife conservation

## CHARACTERIZATION OF ATMOSPHERIC SAHARAN DUST PLUMES USING REMOTE HYPERSPECTRAL IMAGERY FOR PUBLIC HEALTH

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### Abstract

Atmospheric dust affects climate, biogeochemistry, and human health, with total emissions estimated at 1,500–3,000 Tg yr<sup>-1</sup>. The Bodélé Depression, Chad (17°N, 18°E) in the Saharan Desert is the largest single point source of dust in the world, and dust from the Bodélé, and the Sahara in general, has been tracked across much of the world, including to the Caribbean and

The Americas. Though it has been linked to negative health effects in sink regions, few worked to understand its local health effects in Africa. The lack of ground-based stations in North Africa and the inaccessibility of much of the region call for a remote technique to track dust concentration and composition as it moves across Africa. Such a method would provide a more detailed understanding of dust dynamics in North Africa and reveal the potential health effects of dust in the region. Here, we combine aerosol optical thickness measurements from MODIS and dust concentrations from the DREAM model with hyperspectral imagery from the Hyperion sensor onboard NASA's EO-1 spacecraft to reveal differences between calm and dusty scenes in North Africa and compare the data to the ground-based aerosol optical thickness measurements from AERONET stations.

**Key Words:** hyperspectral, Hyperion, Saharan dust, aerosol, West Africa, health

## CIVIL RIGHTS RHETORIC IN MICHIGAN: MINORITY ENROLLMENT TRENDS IN INSTITUTES OF HIGHER EDUCATION 1992 - 2012

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### Abstract

This research focuses on African American enrollment patterns at 2- and 4-year institutes of higher education in Michigan across a 20 year period from 1992 to 2012. The primary purpose of this research is to document and assess changes in African American enrollment at these two institutional levels, and to identify the factors having the most influence on the changes. In addition, the secondary purpose of this research is to determine if any of the changes can be linked to the anti-affirmative action rhetoric which has plagued Michigan for over a decade beginning in 2001 with the Grutter Case. Grutter, the plaintiff charged that the University of Michigan's Law School admission policies were unconstitutional because of racial considerations in the admission review. A back and forward battle between the upper and lower courts ultimately led to a statewide referendum which banned Affirmative Action in 2006. The referendum was known as "The Michigan Civil Rights Initiative." The constitutionality of the ban was challenged and eventually repealed in 2011, but ultimately the Supreme Court upheld the ban in 2014. Analysis of data from the *Integrated Postsecondary Education Data System* (IPEDS) using inferential statistics revealed that, while there were no statistically significant changes in African American enrollment at 4-year institutes, there was a dramatic increase in the number of African Americans enrolling in 2-year institutes. In fact, by 2006 (the year of the ban), the number of African Americans enrolling in 2-year institutes surpassed those enrolling in 4-year institutes. A principal component regression (PCR) on institutional and state electoral data revealed that the factors influencing African American enrollment changed after the ban and that the change was deep-seated at the 2-year level. After the ban, African American enrollment was positively associated with the percentage of the population supporting the ban. A reasonable interpretation of the results suggests that African Americans were more likely to choose 2-year institutes over 4-year institutes in areas where the sentiment against Affirmative Action was strong.

**Key words:** Affirmative Action, higher education, minority enrollment

## CLIMATE CHANGE IN INNER MONGOLIA, CHINA

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## Abstract

Global warming has changed the distribution of climate resources and some previous studies have shown that the arid and semi-arid areas have become drier because of decreasing precipitation. Based on daily meteorological data collected at 46 meteorological stations in Inner Mongolia, we analyzed the spatial distribution and trends of major climate variables (precipitation, daily mean temperature, minimum and maximum temperatures) at monthly and annual scales over the past 52 years, and then the variation of aridity index, i.e., one minus the ratio of precipitation to potential evapotranspiration, was also analyzed.

An increasing trend is shown on the daily mean temperature in the study area, and the trend (0.37°C/decade) is higher than the global warming rate (0.14°C/decade). Compared to daily mean temperature and daily maximum temperature (trend values are 0.37 °C/decade and 0.25 °C/decade, respectively), daily minimum temperature showed greater increasing trend (0.51 °C/decade). As for most stations, the largest trends for daily mean, minimum and maximum temperatures occurred in the last ten days of February. Through a series of regression analysis, it was found that the change of vapor pressure might be the main reason for this phenomenon because temperature increase in late of February was highly correlated with increase of vapor pressure. Annual precipitation showed slightly decreasing, mainly because of the decreasing of precipitation in July and August. 43 out of 46 stations exhibited positive slopes in the time series of aridity index, which indicates that Inner Mongolia has become drier in the past 52 years.

In summary, Inner Mongolia has become warmer and drier with increasing temperature and decreasing precipitation during the past several decades.

**Key words:** Inner Mongolia; climate change; precipitation; temperature; trend

## COMMUNITY ACCESS TO GENERAL AVIATION AMIDST AIRPORT CLOSURES, 1991-2011

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## Abstract

General aviation accounts for 90 percent of U.S. registered aircraft and 75 percent of takeoffs and landings made at U.S. airports. Defined as aviation other than military and commercial airline services, general aviation (GA) encompasses activities ranging from corporate aviation and taxi operations to aerial spraying, sightseeing, flight instruction, and aerial firefighting. In the United States over 5,100 public use airports (PUAs) serve urban and suburban areas but also medium-sized cities, small towns, and rural communities.

Although modest in size compared to major airline hubs, PUAs are often a source of controversy because of noise or proposals to convert airport properties to residential or commercial uses. Airport advocacy groups including organizations representing GA pilots have raised awareness about the loss of PUAs as business and community resources. Indeed, the rate at which new PUAs have been established has not kept pace with U.S. population

growth. Given pressure from developers and others to close PUAs as well as efforts by GA advocacy groups to keep airports open, this paper seeks to determine if recent airport closures have impacted accessibility and how urbanization, economic development, and other socioeconomic factors may be associated with airport closures.

This paper explores two related research questions. First, we examine how accessible PUAs are to most Americans and how airport closures between 1991 and 2011 have impacted that accessibility. We then look for relationships between the loss of a PUA and basic demographic and economic indicators. Changes in overall population, per capita income, poverty, and unemployment rates serve as proxies for the changes in communities that either led to or resulted from a PUA closure.

**Key words:** general aviation, airport closures, socioeconomic impacts

## COMMUNITY GARDENING IN ST. LOUIS: A MICRO-SCALE ANALYSIS OF WHAT WAS GROWN

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### Abstract

A micro-scale geographical analysis of one community garden in St. Louis, Missouri was conducted in order to discover what gardeners grew, why they grew those plants, and why they organized their garden plots the way that they did. This paper reports results on the first research question: what did gardeners in this community garden grow? A plant survey was used to discover what the gardeners grew.

The community gardeners made decisions about plant choice and garden layout by first considering their previous gardening experiences and personal preferences. They then made decisions based on aesthetics, the influence of other people, and a desire to maximize their garden space. These factors led the gardeners to select certain plants at different frequencies. In particular, when compared to the wide body of literature on home gardeners, the community gardeners studied in this research devoted a significant amount of garden space to greens and minimal amount of space to those plants that required more space and/or time to reach maturity.

**Key words:** Community gardens, agro-biodiversity, urban gardening

## COMMUNITY GEOGRAPHY AS A MODEL FOR INTERNATIONAL RESEARCH EXPERIENCES IN STUDY ABROAD PROGRAMS: A CASE STUDY OF BELIZE

Timothy Hawthorne ([thawthorne@gsu.edu](mailto:thawthorne@gsu.edu)) and Christy Visaggi (poster), Georgia State University Department of Geosciences,

### Abstract

Collaborative engagement with local residents and organizations is often cited as one of the most valuable aspects of community-based research integration in classroom settings. However, little has been written on the impact of community engagement in international study abroad programs. We explore the use of community geography in Belize to develop international, community-based research experiences for undergraduate and graduate

students. In our study abroad program, students utilize GIS, GPS data collection, fieldwork and interviews to understand social and environmental issues important to our Belizean collaborators. As we demonstrate in this poster, foreign collaborators often have different expectations, commitments, burdens and resources that either encourage or limit their participation in all stages of the research process. These conflicts present researchers and educators with a significant challenge to identify the appropriate model for community engagement that works best in the particular international context. With these challenges in mind, we examine a community geography model for study abroad programs that has implications for geography and related disciplines as scholars work to create meaningful and sustainable international research experiences that benefit higher education students as well as community residents and organizations in host countries.

**Key words:** community geography, study abroad, international education, fieldwork, Belize

## COMMUNITY-BASED APPLICATION OF CPTED PRINCIPLES AND THEIR IMPACT ON NEIGHBORHOOD IMPROVEMENT IN YOUNGSTOWN, OHIO

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### Abstract

Crime Prevention Through Environmental Design (CPTED) is an applied method of design principles that improve neighborhoods and communities. Although the number of principles varies depending on the situation, five main principles are always observed: Natural Surveillance, Natural Access Management, Territorial Reinforcement, Physical Maintenance, and Order Maintenance. Together, these principles aim to improve the environment of neighborhoods by altering the behavior of individuals in that neighborhood. Urban spaces are designed to naturally prevent or reduce criminal behavior therefore improving the overall safety and well-being of the neighborhood.

Traditionally, these principles have been conducted by urban and city planners with input from the community. Presented here is the notion that select neighborhoods of Youngstown, Ohio are unintentionally applying CPTED principles through neighborhood improvement efforts without being prompted from city planners. Efforts include clearing lots, fencing cleared lots, establishing urban gardens, and maintaining sightlines on lots. The CPTED efforts were performed out of a desire of the residents to improve their neighborhoods and therefore improving the environment in which they live.

A method for mapping the impact of the CPTED efforts on the neighborhoods is presented here. Impact is measured through reduction of neighborhood decline in terms of blight and incivilities. Declining neighborhoods have a higher level of disorder to the environment. A higher level of disorder has been shown to be correlated with higher crime rates. Therefore, a reduction in the level of disorder should result in a reduction of crime.

**Key words:** CPTED, neighborhood disorder, Youngstown

## CONNECTING PRACTITIONERS AND STUDENTS – ADVICE ON CAREER DEVELOPMENT IN THE FIELD OF LOCATIONAL INTELLIGENCE

*Organizer(s):* Murray D Rice - University of North Texas, Tony Hernandez - Ryerson University

*Chair(s)*: Murray D Rice - University of North Texas

*Panelist(s)*: Tony Hernandez – Ryerson University, Linda Peters – Esri, Lawrence Joseph – West Marine, Grant Thrall – Business Geography Advisors, Larry Carlson – Carlson & Associates

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**Session Description:** Locational intelligence (also known as business geography) is a field that applies geographic concepts, skills, and technologies in support of improved decision-making for businesses and other organizations. The future of this field, as with all other geography sub-disciplines, depends on graduates in the field making a smooth transition from student status into challenging and satisfying careers that have a good relationship to their studies. This panel session gives faculty from geography and business and applied practitioners the opportunity to exchange ideas that to help to prepare our students to find good job and career opportunities in locational intelligence.

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**Seed questions for discussion:**

1. What is the current state of the locational intelligence field, and how is the field changing?
  - a. In terms of number of people employed in the field
  - b. In terms of employer awareness of the field
  - c. In terms of employer expectations of graduates in the field
  - d. In terms of student/graduate preparation to work in the field
2. What knowledge and competencies can we count on locational intelligence graduates currently having?
3. What knowledge and competencies do locational intelligence job graduates currently lack?
4. What roles can (and should) students, faculty, graduates, and potential employers play in helping locational intelligence graduates build careers in the field?

**CRIME ON THE CONCRETE CAMPUS: AN EXAMINATION OF CRIME PATTERNS AROUND THE GEORGIA STATE UNIVERSITY CAMPUS**

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**Abstract**

This study examines patterns of crime around the Georgia State University (GSU) campus from January 2007 to July 2012. Since moving into the renovated Bolling Jones Building on Ivy Street in 1947, GSU has gradually built a campus by purchasing surrounding land and buildings in downtown Atlanta. Following the introduction of the Main Street Master Plan in 1997, the university has expanded into areas farther away from its core at the intersection of Peachtree Center Avenue (previously Ivy Street) and Decatur Street.

With the university's expansion and opening of residence halls within walking distance of the core academic buildings, crime on and surrounding campus has gained more attention in the local media. This study examines the influence of routine activity and social disorganization theories on the GSU campus and its surrounding area.

Hot spot analysis is performed utilizing geocoded data from the GSU and Atlanta police departments with a one-mile buffer around a central location on the GSU campus. This

research provides analysis at two scales (repeat places and KDE), and highlights the potential for collaboration between university researchers and the GSU and Atlanta police departments.

**Key words:** campus crime, hot spots, Atlanta

## CRITICAL REFLECTION MAPPING AS A HYBRID METHODOLOGY FOR EXAMINING SOCIO-SPATIAL PERCEPTIONS OF NEW RESEARCH SITES

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Timothy Hawthorne, Georgia State University  
Mary Seidell, The Ohio State University  
Lia Scott, Georgia State University

### Abstract

We introduce critical reflection mapping as a novel and hybrid research methodology for examining the socio-spatial perceptions of researchers in new research settings, particularly international ones. The methodology, theoretically situated within the critical GIS literature, combines two existing research methods (qualitative sketch mapping and critical reflection) to elicit original ways in which researchers can critically reflect on an area new to them while spatially linking these qualitative placed-based reflections to sketch maps. The methodology allows for synergistic datasets to inform each other and to be analyzed together rather than separately. Through critical reflection mapping, we demonstrate how multiple datasets and methods are combined so that critical reflection and word clouds add significant intellectual value by making another layer of textual information immediately accessible to qualitative sketch mapping data analysis. We present a case study from Belize to demonstrate the viability as well as the caveats of this novel methodology for understanding and representing the immediate socio-spatial perceptions of researchers. In the context of international research experiences discussed in this article, the methodology captures individual responses to features of the built environment including walkability and sustainability; documents the changing emotions a newly immersed researcher has in a largely unfamiliar geographic setting; and connects new experiences in a foreign research setting to an individual's everyday lived experiences, positionality, and multiple identities. It also makes these visible experiences more visible to fellow researchers in a large research team and thus lends itself as a potential forum for shared reflection.

**Key words:** Belize, critical reflection mapping, critical GIS, qualitative sketch mapping

## CULTURE, PSYCHOLOGICAL PROCESS, AND GEOSPATIAL THINKING

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### Abstract

People vary in thinking spatially, as a factor of sex, age, and cultural experience (NRC 2006). Vygotsky's "sociocultural theory of psychological process" (STPP) outlines the relation of individual cognitive processes to the cultural products and treats the cognitive development as a process of acquiring culture. Sociocultural theory places culture at the core of human sense-making tasks (Cole 1985). Geospatial thinking is one such task requiring individuals to make

sense of geospace around them. This national study follows Spatial Thinking Ability Test (STAT) (Lee and Bednarz 2012; AAG 2006) to confirm that cultural variables, such as ethnicity or socioeconomic status, influence geospatial thinking abilities of undergraduate students (n = 1479) in public universities (n = 61) in the United States. Cultural differences entail that many children do not develop sound spatial thinking skills in their natural home and school environment, and thus explicit spatial education is required (Liben 2006).

**Key Words:** geospatial thinking, culture, sociocultural theory, Vygotsky, psychological process

## DECODING THE FORMATION OF A RETAIL GIANT: THE EVOLVING GEOGRAPHY OF COSTCO'S STORE NETWORK

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### Abstract

Although Costco operates over 580 warehouse stores throughout North America, their location strategy remains relatively unexamined in the economic geography literature. A cursory examination of Costco's network makes it clear that the firm chooses to locate primarily in the suburbs of major cities, where income levels are somewhat higher than the national average. However, what is not clear is the extent to which other demographic and geographic factors adequately account for Costco's store locations, and what strategy underlies the geography of the firm's warehouse stores, especially in relation to its distribution network.

This research studies Costco in order to decode the location strategies that have guided the company's North American and international expansions. The investigation attempts to identify key elements of Costco's multinational retail network, including this network's evolution over time. This paper seeks to benefit both retail business and public policymakers by highlighting elements of Costco's location strategy that have contributed to the firm's success.

**Key words:** retail, expansion, distribution center, geography, locational intelligence

## DECREASING WETLAND COVER IN EAST KOLKATA, INDIA FROM 1972 TO 2011 AS DETECTED BY REMOTE SENSING TECHNIQUES

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### Abstract

Rapid population growth is a main driver for recent land use and land cover (LULC) dynamics, especially in developing countries where the pressure of accommodating swelling populations and food production has led to intensive conversions of wetlands to built-up area and agricultural land. Urban sprawl in wetland regions can greatly increase impervious surfaces and thereby lead to changes in water cycling, biodiversity and regional climate; while agricultural expansion increases the drainage ditches and can significantly lower the water table of wetlands

and reduce water-storage capacity, changing local hydrological cycling such as precipitation and runoff levels.

East Kolkata Wetlands (EKWs) in India are important wetlands in both India and Bangladesh and were designated a “Wetland of International Importance” under the Ramsar Convention in 2002. However, the areas of the wetlands decreased continuously during recent decades due to increased human population and activities. In this study LULC dynamics in EKWs will be analyzed by four Landsat images from 1972 to 2011 through the Geographic Object-Based Image Analysis. Then a post-classification method will be applied to quantify areas and patterns of wetlands converted to built-up area and areas of wetland changed to agricultural land. Results of the study will provide information on the historical LULC changes which can be used to assess their impacts on regional hydrology, biodiversity and local climate as a result of urban and agricultural expansion.

**Key Words:** Geographic Object-Based Image Analysis; Wetland shrinkage; Urbanization; East Kolkata Wetlands

### DERIVING LCC 2SP PARAMETERS FROM LCC 1SP PARAMETERS

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#### Abstract

Lambert Conformal Conic Projection abbreviated as LCC projection is a conical projection used for the surveying and mapping projects in many countries. It comes in two forms; secant and tangential form. The secant form with one single standard parallel abbreviated as LCC 1SP having scale factor less than unity and two standard parallels (LCC 2SP) having scale factor of unity on each. This paper presents a method to derive values of two standard parallels from one standard parallel and proves their equivalency to each other by comparing the coordinates of sample data points.

**Key Words:** Lambert Conformal Conic Projection; Standard Parallel; Scale Factor;

### DESIGNING NEW OPTIMAL ROAD ROUTE USING REMOTE SENSING AND GIS TECHNIQUES: A CASE STUDY OF TAKHT BHAI AND MANDOORI, MARDAN, KPK PAKISTAN

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#### Abstract

The growing concern for sustainable economic growth in developing countries like Pakistan highlights the need of new optimal road routes. Optimal road routes provide rapid mobility for trading and traveling, either nationwide or internationally which leads to overcome poverty. Formal methods of route design are time consuming, laborious and inaccurate especially while dealing with large geographic and hilly areas. GIS and remote sensing techniques can be effectively employed in the design and development of road routes. Efficient integration and

analysis of Topography, vegetation, geology, soil type, land use, slope and landslide data guarantee the safe and well planned route design.

In this paper we have presented the use of GIS and remote sensing for designing road route between Takht bhai and mandoori lie in mardan distric, khyber pakhtonkha pakiistan. Total length of roads in Pakistan is 181836 km. Takht bhai is a UNESCO World Heritage site and famous for Buddhist monastic centers. Slope information is extracted from digital elevation model. Landuse, geology and hydrology inofrmation is converted from conventional methods into geo spatial database. This spatial data and slope data integrated with source and destination to calculate the route. The slope data is given more weight due to hills between takht bhai and mandoori. The results describe when the permitting slope value is increased in route processing the length of route is decreased and vice versa due to presence of large hill between source and destination. Using GIS and remote sensing system it reveals that route planning becoming easier, cheaper, time saving and well planned.

**Key Words:** Road, Route, GIS, Remote Sensing, Sustainable

## DETERMINING THE TIMING AND CAUSE OF A LOW-GRADIENT, CHRONICALLY HYPOXIC REACH OF THE NORTH BRANCH OF THE KAWKAWLIN RIVER IN BAY COUNTY, MICHIGAN, USA

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### Abstract

Measurements by the Michigan Department of Environmental Quality (MDEQ) show that a particular reach of the North Branch of the Kawkawlin River has been experiencing chronic low dissolved oxygen (DO) levels, which have led to fish kills in the past. Within this reach, the river lacks a well-defined channel and swampy conditions exist. While it was clear that this swampy area is directly related to water chemistry and corresponds to low DO levels, it was not clear how long this has been the case or what was causing these conditions. Therefore, we sought to identify when these swampy conditions were first known from this reach of the river, and to identify what the cause is and if that cause is human or natural. Aerial photography from the 1930s revealed that the reach already existed at that time, so excess sediment runoff from the switch to larger-scale agriculture is not the cause. Historical survey notes from the 1840s suggest that the reach was already swampy during that time, meaning that the initial conversion of the area from forest to farmland was not responsible either. Because this survey predated significant human activity in the region, it suggests that the cause is natural rather than human. A visit to the area revealed a deposit of rocks at the head of the swampy reach. This deposit is acting as a dam for the swampy reach upstream. Future work at this site will include identifying the origin of this rock layer.

**Key words:** water chemistry, aerial photography, river channel morphology

## ECO-CONSCIOUS TOURISM ON THE REEF IN SOUTH WATER CAYE, BELIZE

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## Abstract

The Belize Barrier Reef represents the longest complex of coral reefs in the Western Hemisphere and provides extensive opportunities for tourism in marine ecosystems across the country. However, similar to other locations in the Caribbean, reefs in Belize are threatened by a variety of anthropogenic disturbances. To promote eco-conscious tourism on the reef, students mapped corals, sponges, and fish along the small island of South Water Caye off the coast of Dangriga as part of a GIS study abroad course through Georgia State University. Teams of students used a combination of kayaking and snorkeling to collect data on the reef regarding both health and biodiversity of marine life. Targeted species were selected based on monitoring reports for the marine reserve. Hard corals (e.g., *Acropora*, star coral, fire coral, brain coral) were documented with sponges, sea fans, and other soft corals additionally noted as observed. Signs of disease, bleaching, breakage, and algal overgrowth were also recorded. Fish identification included a focus on queen triggerfish, parrotfish, angelfish, butterflyfish, sergeant majors, and many more.

GIS mapping was used to document the presence and abundance of key biota and examine patterns in distribution with conservation in mind for future visitors to the reef off of Pelican Beach Resort. Map analysis revealed the best locations for swimmers to maximize their experience for safely observing both diverse fish and healthy coral. Furthermore, data collected on fish populations will be incorporated into the citizen science REEF database available online as part of our ongoing research in Belize.

**Key Words:** GIS, coral reefs, marine GIS, eco-tourism, geographic education

## EDWARDS AQUIFER REGION STAKEHOLDER GROUP FRAME ANALYSIS IN A DROUGHT PRONE CLIMATE

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## Abstract

The 2011 drought was the worst single-year climatic occurrence in Texas' recorded history (Texas AgriLife, 2011). Texas must meet residential and economic development requirements of a population that will nearly double over the next 50 years and will require dramatic improvements in water conservation and reuse.

Located in the south-central region of Texas, the Edwards Aquifer is an underground karst formation with water flowing through it that has been at the center of controversy for over 60 years. As the sole source water supply nearly two million people in San Antonio, the controversy over the use of the Edwards Aquifer water centers on four major concerns: its limited physical structure, it's multiple users, it's potential contamination, and the potential loss of endangered species.

This qualitative study uses interactional frame theory to demonstrate "characterization" and "identity" framing, and provides a definition of "frame theory," its nature, and development. This research will employ the concept of "framing" to shape, organize, and focus on new agendas of today's stakeholders.

The purpose of this study is twofold. The first purpose is to revisit a previous case study by Putnam and Peterson (2003), and re-evaluate the nature of the conflict since that time and to re-examine and possibly reframe, if necessary, any lingering unsolved arguments by the original stakeholder groups included in the 1980-1997 analysis. The second purpose is to discover the extent to which new conflict has arisen from today's stakeholder groups, as well as the intensity of that conflict compared to the 1980-1997 period of legal turbulence.

The results of this study identify key stakeholder groups in the Edwards Aquifer region that, as a result of Senate Bill 3 in 2007, through a consensus-based approach have successfully mitigated the intractable environmental conflict of the aquifer. The stakeholder process has implemented a Habitat Conservation Plan to protect spring flows, downstream economic interest, and endangered species. However, lingering problems related to property rights issues and potential "takings" liability, as well as a voting rights lawsuit brought by the League of United Latin American Citizens and enjoined by the San Antonio Water System threaten to unravel the process.

**Key words:** drought, ground water, stakeholder frame analysis, Edwards Aquifer, water conservation, Texas water law, interactional frame theory

#### References:

- Putnam, L. L., and T. Peterson. 2003. The Edwards Aquifer Dispute: Shifting Frames in a Protracted Conflict. In *Making Sense of Intractable Environmental Conflicts*. Lewicki, Roy, B. Gray, and M. Elliott, (eds.). Island Press, NY.
- Texas Agrilife Extension Service. "Texas Agricultural Drought Losses Reach Record \$5.2 Billion." <http://agrilife.org/today/2011/08/17/texas-agricultural-drought-losses-reach-record-5-2-billion/> (last accessed September 24, 2013).

## EMPIRICAL EXAMINATION OF NEIGHBORHOOD CONTEXT OF INDIVIDUAL TRAVEL BEHAVIORS

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### Abstract

In recent years, recognition of the importance of neighborhood context has produced a growing body of geographic research. When making their activity/travel decisions, individuals are restricted in different ways. In particular, individual choice behavior is often influenced by neighborhood environment and a built environment.

This study using the 2010 household trip survey demonstrated the effectiveness of incorporating multi-level mechanisms in various contexts of activity-travel behavior by comparing with traditional models. The analysis shows that one individual's activity participation patterns with respect to mode choice, trip count, trip distance, and time, under a variety of spatio-temporal constraints, tend to be affected by shared characteristics of neighborhoods. The results also imply that neighborhood travel behaviors are significantly influenced by neighborhood characteristics requiring policy makers to consider not only individual characteristics but surrounding environment.

**Key words:** trip behavior, trip survey, multilevel, neighborhood, context

## ENHANCING TEACHING AND LEARNING OF GEOGRAPHY CONCEPTS IN JUNIOR HIGH SCHOOLS IN GHANA

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### Abstract

Geography education has been part of Ghana's educational curriculum for decades, however, the teaching and learning of geography has been woefully ineffective, with the overwhelming majority of Junior High School students receiving low quality geography education. The poor state of geography education in Ghana's Junior High Schools undermines the development potential of future generations. The study determines the underlying causes of pupils' poor performance and low interest in geography education. A cross-sectional survey was used to gather data from 205 Junior High Schools (JHS 1 – JHS 3) randomly drawn from 11 educational circuits. An assessment of geographic concepts and skills revealed failures in Ghana's geography education at the lower level. The following were identified as major factors contributing to students poor performance and low level of interest in geography; limited use of teaching and learning materials; inability of teachers to choose and apply appropriate teaching strategies, techniques and methods; limited field exposure of students.

**Key Words:** Educational curriculum, geography education, junior high school

## ESTIMATION OF WATER QUALITY DEGRADATION USING LANDSCAPE INTENSITY INDEX IN KPK, PAKISTAN

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### Abstract

This paper encompasses the impact of land use intensity on water quality in selected districts of KPK-Pakistan. Water quality is an advancing concern worldwide. Urbanization and land use intensity is enhancing the quality degrading aspect of water. The Industrial, commercial and urban centers pose high land use intensity. A spatial tool, Landscape Intensity Index (LDI), from raster land use map was applied to estimate land use intensity. A total of 1742 water samples from the districts of Bonair, Swat, Dir Lower, Dir Upper and Mardan were collected as of public tube wells, domestic tube wells, public works taps, hand pumps, open wells, springs and surface water resources. Water quality was studied regarding the bacterial content, color, odor, pH, electrical conductivity (EC), taste, turbidity, total dissolved solids (TDS), hardness and the concentrations of arsenic, bicarbonate, carbonate, chlorine, fluoride, iron, magnesium, nitrate, potassium, sodium and sulphate in collected water samples. Estimated safe sample and land use percentages are 30 and 91 for Bonair, 15 and 54 for Swat, 04 and 98 for Dir Lower, 10 and 97.5 for Dir Upper and for Mardan 21 and 96.5 respectively. The investigations revealed that a reverse relation exists between land use intensity and water quality of the project area. High cropping intensity, such as, 193% in Swat District demonstrates a deviation from the investigated relationship.

**Key Words:** land use intensity, Water Quality Degradation, Landscape Intensity Index (LDI)

## EVALUATING AND RE-DEMARCATING THE HOSPITAL SERVICE AREAS IN FLORIDA

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### Abstract

The hospital service areas (HSAs) better portray underlying local patterns of hospitalization than administrative units, offering promise for small area analyses. However, the widely used Dartmouth HSAs in the United States were generated almost two decades ago, according to solely Medicare inpatient records. Collecting individual discharge records from 281 Floridian hospitals in 2011, we matched Medicare records in 2011 to the 1992-1993 Medicare-derived HSAs for demonstrating the temporal variation of the Medicare-derived HSAs. The overall records in 2011 were matched to 2011 Medicare-derived HSAs for evaluating the representativeness of the Medicare-derived HSAs. The localization index within the HSAs was calculated using Geographic Information Systems (GIS) and statistically compared. The boundaries of the Medicare-derived HSAs have significantly shifted over two decades, and been proved to be inappropriate when applied for the overall population. The extended Huff model was used to generate comparable but more solid HSAs than traditional approaches.

**Key Words:** Hospital service area; GIS; discharge; hospitalization; HCUP; Huff model; Florida

## EVALUATING THE RELATIONSHIP BETWEEN FOOD ACCESS, URBAN ENVIRONMENT, AND FOOD SECURITY IN GEORGIA'S OLDER POPULATION

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### Abstract

The population of older individuals in the United States is growing at a rapid pace, with its share of the total U.S. population expected to double in the next fifty years (U.S. Census Bureau, 2012b). Over 80% of older adults have at least one chronic health problem, and 62% of them have multiple health problems (Wolff, Starfield, & Anderson, 2002). While food insecurity may be most closely linked to economic circumstances and physical or mental limitations, a growing body of research has shown that the physical and social environment can have a significant influence on food insecurity rates (Carter, Dubois, & Tremblay, 2014).

This paper reports on existing research collaboration with Georgia's Division of Aging Services (DAS). We use data from the DAS Aging Information Management System (AIMS), which lists information on all current or pending clients in the state's program (n=38,816). We geocoded this data and added residence in a food desert, as defined by the USDA's Food Access Research Atlas, and whether the place of residence was in a rural, exurban, suburban, or core urban. The latter classification is a new measure developed from historic census data. We explored the relationships of these variables to rates of food insecurity using visualization techniques and by developing a logistic regression model. Our analysis showed a modest but significant positive relationship between food insecurity and residence in a food desert tract (1.03 OR), as well as in core urban (1.15) and fringe exurban areas (1.04).

**Key Words:** Food insecurity, health geography, older populations, neighborhood effects

## EVALUATION OF PHOTO/VIDEO LOGGING METHOD TO COLLECT HIGHWAY INVENTORY DATA

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### Abstract

For many years, state departments of transportation (DOTs) and local agencies have collected and maintained highway inventory data (HID) in order to assist the decision-makers at different levels. In light of the implementation of the recently published Highway Safety Manual (HSM) in 2010, many state DOTs have sought to tailor the various safety measures and functions to evaluate the safety in their jurisdictions. However, insufficient HSM-required HID in many current DOT's databases necessitates the collection of the absent features. In order to obtain these data, various techniques for different purposes have been utilized, including field inventory, photo/video log, integrated GPS/GIS mapping systems, aerial photography, satellite imagery, terrestrial laser scanners, airborne LiDAR, and mobile LiDAR. Among many data collection methods, the photo/video log is widely employed by DOTs due to its simplicity and low cost. Therefore, the focus of this manuscript, which is a timely and needed research, is to evaluate the capability of the photo/video logging method to collect HID for supporting HSM implementation through a comprehensive literature review, a nationwide survey, and a field trial. The results of this study demonstrated that the photo/video log can provide worthy and relevant HSM datasets with acceptable accuracy.

**Key Words:** Highway Inventory Data (HID), Highway Safety Manual (HSM), Photo/Video Log Method, Data Collection

## EXAMINING SPATIALLY VARYING RELATIONSHIPS BETWEEN PRETERM BIRTHS AND SOCIOECONOMIC, ENVIRONMENTAL, AND BEHAVIORAL FACTORS USING GEOGRAPHICALLY WEIGHTED LOGISTIC REGRESSION

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## Abstract

Preterm Birth (PTB) is an important cause of infant morbidity and mortality. Previous studies have found that PTB is associated with many socioeconomic, environmental, and behavioral risk factors. However, the results from different studies are not consistent. It seems that different factors make different contributions to PTB in different studies conducted in different places. In this study, a spatial statistical technique, Geographically Weighted Logistic Regression (GWLRL), is used to examine the spatially varying relationships between PTB and socioeconomic, environmental, and behavioral risk factors in the State of Georgia, USA. The risk factors examined include census tract level variables, such as income, education attainment, and land use, and individual level variables, such as maternal smoking, drinking, and prenatal care. Geographic Information System (GIS) analyses are used to derive and link the dependent variable (individual level PTB) and the independent variables (risk factors). The application of GWLRL finds that the relationships between PTB and risk factors change greatly over space. Different parts of the study area have different significant risk factors. Thus, health policies should be adjusted in different areas based on the spatially varying associations of PTB and risk factors.

**Key Words:** Preterm Birth, Risk Factors, Geographically Weighted Logistic Regression

## EXAMINING SUGARCANE FARMING IN BELIZE WITH COMMUNITY GIS AND MOBILE MAPPING

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Jessamyn Ramos and Gregorio Canto, Belize Sugarcane Industry Research and Development Institute

Davette Gadison and Karim Minkara, Georgia State University

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Ray Maldonado, Georgia State University

Antonio Cano, University of Belize

Timothy Hawthorne, Georgia State University

## Abstract

This presentation focuses on an international collaborative research partnership between the University of Belize, the Belize Sugarcane Industry Research and Development Institute, and Georgia State University. The collaboration use GIS, mobile mapping, and local knowledge from Belizean farmers to map and understand the productivity of sugarcane farms in the Orange Walk District of Belize. The presentation will include a discussion about the pilot study, and how the pilot data will eventually lead to a larger, countrywide GIS management system for the sugarcane industry as well as other agricultural sectors across Belize. The presentation highlights the importance of collaborative research, local knowledge, and the possibilities for collaborative international research teams to share knowledge and expertise for applied geographic research that has broad societal impact in developing countries such as Belize.

**Key words:** Belize, agriculture, sugarcane, farming, GIS, mobile mapping

## EXAMINING THE BOUNDARIES OF FACTORY OUTLET RETAILING IN CANADA

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### **Abstract**

Factory outlets are a long-standing element of the retail structure of North America. Their origins can be traced back as small retail outlets that were typically attached to manufacturing facilities and set up to sell sub-standard and end-of-line products. Today they have evolved into a shopping centre format of their own. Factory outlet centres, in a variety of guises, are comprised of clusters of ‘outlet’-styled stores that provide consumers with sought after brands at reduced prices. Over recent years there has been growing interest and a resulting resurgence in the development of factory outlet centres in Canada. This paper examines the factors that have led to their recent growth, explores their emerging geographies and estimates their growth potential. The factory outlet phenomenon is placed within the broader context of the Canadian retail structure and the impact of these centres on existing retail discussed.

**Key Words:** retail location, factory outlets, trade areas

## EXPANDING CULTURAL GEOGRAPHY DISCOURSE: COMMUNITIES AND DEFINITIONS OF PHILANTHROPY IN SOUTH AFRICA AND MOZAMBIQUE

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### **Abstract**

The practice of studying the act of “giving” or notions of “charity” and “philanthropy” within African society has had, within current academic debate, two primary areas of focus. The first has focused on African communities and the ways in which they ‘receive’ charity and utilize what they have been given according to cultural practices and community definitions. The second has focused on emergence of wealthy Africans as a uniform group, crafting their philanthropic efforts to assist with development challenges facing Africans at large.

My PhD research attempts to shift the discussion of cultural geography utilizing the framework of cultural geography to analyze *how* the giving patterns of communities in Mozambique and South Africa have shaped societies where they live and work, paying close attention to works of scholars such as Tim Cresswell, who has discussed ideas of “Moral Geography.” This presentation will be based on initial review of the literature that exists on African philanthropy in the context of the broader cultural-geography discourse.

Though in its initial phase, this research will examine two townships in and around Cape Town, South Africa and two neighborhoods in and around Maputo, Mozambique. This study is significant for Mozambique, which has historically had no cultural geographic research conducted outside of post-conflict economics.

**Key Words:** community practice, giving, philanthropy, cultural geography

## EXPEDITION ENDURANCE: AN INQUIRY INTO HUMAN SURVIVAL

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### Abstract

Ask any of your general education students in your geography course the simple question, "What is the most important natural resource on Earth?" With puzzled expressions, a multitude of answers come from their mouths except one; water. The one precious resource is sometimes forgotten and is the only one that is required to survive and sustain civilization.

"Expedition Endurance" is a documentary film project that was created to educate a team of four university students, K-12 classrooms, university geography courses, and the general public through the Public Broadcast Service (PBS) about the importance of water conservation like that of the western states. Water agencies and districts in California, Colorado, and many other states have developed water conservation curriculum to educate future citizens of western states about the importance of water. This idea is missing from many Midwestern schools due to the fact that the Midwest does not foresee a water shortage issue like that of the west. Although the current water problem is not strongly visible in the Midwest today, the problem will continue to amplify in the years to come as drought becomes more frequent and the aquifer supply continues to dwindle due to agriculture and an increase in population.

This paper will highlight the methods and effectiveness in communicating the water resource issue to both the classroom and the larger PBS audience through the lens of a geographic documentary film crew.

**Key words:** water conservation, education, documentary film, drought

## EXPLORATORY SPATIAL DATA ANALYSIS OF THE DISTRIBUTION OF MULTIPLE CRIMES IN ATLANTIC COASTAL CITIES

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### Abstract

In environmental criminology, there is spatial interaction between the geographical locations of crimes. This study aims at exploring global and local spatial autocorrelation to characterize the way crime activities are located in three Atlantic coastal cities. Using three crime types (Burglary, Larceny, and Auto theft) in the cities of Mobile, Alabama and Pensacola, Florida, as well as Miami, Florida over the 2005-2006, we compute a global spatial autocorrelation statistic, as well as local Moran autocorrelation statistics (Moran scatterplot) in order to detect clusters of high and low crime rates. Indeed, the existence of those clusters would be an indication of the persistence of spatial disparities between neighborhoods.

Results showed high in global spatial autocorrelation statistic in three cities. However some differences do exist in the amount of autocorrelation between each city. Miami had the highest burglary and auto theft Moran's I test statistics with 0.93611 and 0.97765, respectively. Mobile had the highest larceny Moran's I with 0.87530, and Pensacola had the lowest of all three. Also, all three crimes show significant spatial autocorrelation at local level. There are little "atypical" regions i.e. deviating from the global pattern of positive autocorrelation. The

findings of this study are important for identifying crime clusters in three Atlantic coastal cities, and relationships with geographically relevant proximity variables of crime.

**Key words:** crime, spatial autocorrelation, Moran's I

## FIELD STUDIES, SILVERTON, COLORADO: A MODEL GEOGRAPHY COURSE FOR DELIVERING HIGH IMPACT EDUCATIONAL PRACTICES (HEPS)

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### Abstract

High-Impact Educational Practices (HEPs) are a set of specific teaching and learning approaches proven effective in college and university education. When students participate in HEPs, which include learning communities, undergraduate research, collaboration on assignments, and capstone courses, the learning outcomes are positive and retention is increased. This paper describes an undergraduate place-based experiential field studies course taught through the University of Colorado Colorado Springs (UCCS) that weaves together multiple HEPs. The eight day four credit hour course focuses on snow and ice processes, and is taught each winter in Silverton, Colorado, a remote mountain town high in the San Juan Mountains. The high concentration of education-based services in Silverton, coupled with the town's rich diversity in physical and human geographic characteristics, creates an environment well suited for HEPs. This paper describes the course, its forty year history, and ties the course to specific HEPs. The course structure could easily be transposed to other locations, and could cover virtually any thematic area.

## FOOD ACCESS AND OPPORTUNITY IN RURAL SOUTHERN ILLINOIS: A GIS ANALYSIS

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### Abstract

Accessibility to fresh and healthy foods in rural areas is inherently uneven, and there can be serious health consequences for rural residents who may have difficulty maintaining a healthy diet. However, much of food access research neglects to include secondary food sources, such as farmer's markets, pharmacies, and convenience stores, into the picture of food access in rural areas. This research evaluates access to three categories of food outlets, grocery, temporal, and convenience, using a weighted cumulative spatial opportunity model and a geospatial analysis, to determine total food access in 34 rural counties in southern Illinois. Areas of high food access are clustered near larger settlements and along interstate travel corridors, where grocery stores tend to be located. However, many rural areas rely heavily on temporal food sources, including farmer's markets and farm stands. The seasonal nature of these food sources means that food access can vary dramatically over the course of the year for local residents. Additionally, the dramatic impact of a grocery store closure of local food access is quantified, further displaying the fluid nature of food access in rural areas.

The use of a weighted cumulative spatial opportunity model can give food access researchers a clear and complete picture of food access in any region, and the access value that it calculates provides a solid starting point from which to devise methods for dealing with access issues.

**Key words:** food, access, rural, GIS

## FOOD VS. FUEL: A GEOGRAPHIC EXPLORATION OF AGRICULTURAL LANDS DEVOTED TO BIOFUEL PRODUCTION

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### Abstract

Corn-based ethanol has been at the center of biofuel debates since the oil embargo in the 1970s. Undeniably, the policy decisions made regarding corn-based ethanol have wide-ranging implications on fields as diverse as energy consumption, hunger and malnutrition, environmental degradation, and economics. As biofuel production has increased in response to government policies, concerns have been raised regarding the economic stability and land usage of farmers in the US. As farmers shift more available land to the production of corn to meet the demands of the ethanol industry, they move away from growing a diversity of crops in order to maximize profits. This single crop system is more susceptible to changes in price and exposes farmers to greater risks should their crop fail. It also has detrimental impacts on farmland health, as corn is a heavy consumer of nutrients and water. Using geographic, cartographic, and statistical methodologies this presentation will explore the correlations, over time (2007 - 2012), between all harvested acres and corn specific harvested acres within each county of the continental US.

**Key words:** Ethanol, Agricultural Land Security, Land Usage.

## FROM INTERDISCIPLINARY GEOSPATIAL PLATFORM TO MAPPING CLASS AND BACK AGAIN

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### Abstract

This presentation explores the potential for developing interdisciplinary courses based on long-term development projects. The ATLmaps platform combines archival maps, geospatial data visualization, and multimedia location “pinpoints” to promote investigation into issues about Atlanta. The project was developed by a highly interdisciplinary team from the Departments of Communication, English, and Geosciences, and the University Library and Center for Instructional Innovation. From the start, the platform was created with both teaching and research in mind. After two years of work culminating in a Beta version of the site, members of the team developed a course that both used the platform as a teaching tool and used student work as content. The interdisciplinary Honors seminar used Atlanta-based projects to introduce undergraduate students to emerging mapping technologies that have potential applications across many fields. Students explored urban research questions through projects involving citizen science, community mapping, and geospatial storytelling. Their projects will eventually be integrated into the ATLmaps platform.

**Key words:** geographic education, GIS, mapping, citizen science, storytelling

## FUNCTIONALITY AND USABILITY EVALUATION OF WEB GIS IN ACADEMIC LIBRARIES

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### Abstract

The rise of web GIS has brought great opportunity in academic libraries for information seeking. Users can search spatial information, create customized maps, as well as perform simple spatial analysis without GIS training. In this study, we evaluated and assessed the major functionalities of web GIS, and their potential value in terms of information discovery and access. A combined method of literature review and case studies was used to generate the GIS function metrics. In addition, since web GIS serves for non-GIS professionals, we also conducted an empirical usability evaluation of six most popular web GIS in academic libraries. Eighteen university students participated in the evaluation in which they completed tasks of creating a customized map, changing map display options, and exporting maps. These tasks represent the typical workflow of using a web GIS for users without GIS background and experience.

Our results provide a detailed GIS functionality metrics of web GIS in academic libraries, with discussions about the importance of each function for information seekers. For usability, we measured task successfulness, task completion time, number of times help was needed, number of errors, and participants' ratings of the System Usability Scale (SUS). With these results, we were able to identify features web GIS must follow, should follow, and should avoid.

To the best of our knowledge, this is the first study to examine the web-based mapping applications in a systematic way. Results from this study will be a valuable tool for general information users who don't have a background of GIS and usability to evaluate web GIS resources. The results will also serve as an important reference for web GIS developers to design and develop their applications to better serve users' needs.

**Key words:** web GIS, GIS function, usability, information seeking

## GEOBIA BASED HIGH SPATIAL RESOLUTION LAND COVER MAPPING OF OAKWOOD, GA

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### Abstract

Oakwood, GA is located on the shores of Lake Lanier and is a rapidly developing township as the region urbanizes rapidly. This project has developed a high spatial resolution Map of Oakwood, Georgia using 4 band NAIP Imagery and LiDAR. The imagery was processed using Erdas Imagine software and the LiDAR was processed using QT Modeler to create a nDSM. A

ruleset was developed in eCognitionsoftware to extract the land cover. A discussion of the process and an analysis of the results will be presented.

## GEOBIA OF EGMONT KEY: DIGITAL IMAGE PROCESSING

Corryn Smith, University of North Georgia and J. B. Sharma, University of North Georgia

### Abstract

A high spectral resolution land cover map for Egmont Key, Florida was derived using four band NAIP imagery and LiDAR using geographic object based image analysis (GEOBIA). Egmont Key is a barrier island found in the mouth of the Tampa Bay. Barrier islands are important to the ecosystem since they are homes to different types of plants and creatures such as gopher tortoises, shorebirds, and hummingbirds. Barrier islands also protect coastal environments during storms by acting as a buffer from erosion and damage. This place is very unique due to the fact that it was once a fort during the Spanish-American war. Remains of the fort are still on the island and have been mapped using LiDAR and orthoimagery. Using GEOBIA, a ruleset was created to pull out the buildings, trees, ground/sand, and even shadows. The process followed and the results of this project will be presented and analyzed

## GEOGRAPHIC PATTERNS OF HIGH PRETERM BIRTH CLUSTERS IN GEORGIA, 1995 TO 2012

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Preterm birth (PTB) rates have been increasing continuously in the 1990s and 2000s in the United States, especially in a few southeast states including Georgia. This study is aimed to investigate the geographic patterns of high PTB county clusters from 1995 to 2012. Yearly county-level PTB and non-PTB counts were obtained for all 159 Georgia counties between 1995 and 2012 from Georgia Department Public Health. Spatial scan statistic is used to search for clusters of cases without specifying their size or location ahead of time and the largest search radius was set as the 50% of the total births in the state. All the statistical analyses are conducted for all the births, black births only and white births only and for the periods of 1995-2000, 2001-2007, 2007-2012, and 1995-2012. Results indicate a statistically significant, temporally consistent, and geographically broad cluster of high PTB region in southwest Georgia ( $p = 0.0001$ ) for both black and white birth groups. In a following study, county-level socioeconomic status (SES) will be adjusted to eliminate a significant known confounding variable that may impact the pattern of high PTB cluster.

**Key Words** Preterm birth; spatial cluster analysis; temporal trend, Georgia

## GEOGRAPHIC PATTERNS OF YEARS OF POTENTIAL LIFE LOST FOR MAHONING COUNTY, OHIO CENSUS TRACTS

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## Abstract

Years of Potential Life Lost, (YPLL) is a health indicator that gives insight to the health of a particular population. Life expectancy of 75 years is used to determine the years a person could have lived, this early loss of life may result in loss of economic productivity for a specific region. To determine cause of death related to premature death in Mahoning County, Ohio, YPLL was calculated for 2010 to help provide data regarding early loss of life in a specific location. This case study was designed to compare differences in YPLL results in the urban, suburban, rural and old industrial regions of the county.

This case study was driven by the following research questions: 1. What is the YPLL rate for census tracts in the old industrial, rural, suburban and urban areas of Mahoning County in Ohio? 2. What is the nature of deaths in the four areas? 3. How do the results for Mahoning County compare to the state and the U.S results during the same year? The study results will show how Mahoning County compares with the state and National level. Comparisons of similarities or differences between the regions of Mahoning County will be made possible by the use of GIS map models. The results of this study will be used to influence policy changes in order to prevent future instances of preventable deaths resulting in a reduction of YPLL due to preventable causes.

**Key Words:** YPLL, health indicators

## GEOGRAPHICALLY-BASED HEAT SAFETY THRESHOLDS IN ATHLETICS

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## Abstract

Wet Bulb Globe Temperature (WBGT) is a common measure of heat exposure used widely in athletics, the military, and occupational safety. Many interscholastic athletic programs rely on heat safety guidelines provided by The American College of Sports Medicine (ACSM) which use WBGT. These guidelines, however, employ fixed thresholds that neglect regional variations in acclimatization to heat. It is well established that there are geographically diverse exposure-response relationships related to regional acclimatization, with lower minimum mortality and morbidity thresholds in cooler climates. A modeled climatology of WBGT (1991-2005), consisting of data from around the contiguous United States, is used to identify geographic patterns of various warm season (May-September) local extreme WBGT values. The data reveal large regional variability in extreme WBGTs across the country, with the southern region of the United States exceeding ACSM recommendations more frequently than areas in the Pacific Northwest, Upper Midwest and New England. This suggests that a “one size fits all” approach to heat safety categories is insufficient. We develop three sets of heat safety categories using the 90th WBGT percentile as the critical cutoff for canceling exercise:  $\geq 32.3^{\circ}\text{C}$  as category 3,  $30.1\text{-}32.2^{\circ}\text{C}$  as category 2, and  $< 30^{\circ}\text{C}$  as category 1. It is our hope that these preliminary categories will serve as a foundation in addressing the need for geographically relevant heat safety guidelines.

**Key words:** heat exposure, athletics, United States

## GEOGRAPHY OF SOCIAL MEDIA: A LOOK AT GEOGRAPHIC AND TEMPORAL TRENDS OF THE APRIL 2<sup>ND</sup> SHOOTING INCIDENT AT KENT STATE UNIVERSITY

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### **Abstract**

A Kent State University freshman prompted a campus lockdown on Wednesday (4/2) night when he shot himself in the hand during a domestic dispute in the parking lot by Bowman Hall. No one was injured in the incident. News of the April 2<sup>nd</sup>'s shooting on Kent State University's Kent campus spread quickly on social media. Reactions to shooting are vital to campus safety.

Using programmed tweet search tools and geospatial technology, we analyzed spatial, temporal and textual content of tweets concerning this incident. We first collected tweets with the Key Words including gunman, shooting, safe, police, evacuate, bowman, Kent state, campus that were from locations within 120 miles from Bowman Hall.

While we wish incidents such as the April 2<sup>nd</sup> shooting had never occurred, the proliferation of social media outlets and their uses have given us a new way of seeing how people reacted to such events and how people communicated related information now. The power of social media is just beginning to show its potential. The geography of tweeted messages shows the locations where people cared about this incident. The temporal pattern of tweets shows how concerned people were about the incident.

In the case of the April 2<sup>nd</sup> incident, tweets about the shooting appeared much earlier than announcements made by Kent State Police or Kent State University. Such tweets proved to be of great value in informing students and residents of such event which might have prompted them to seek shelters or to engage in other safety measures. If a set of Key Words were carefully selected and used in monitoring tweeted messages, it may even be possible to formulate an early warning system to enhance campus safety and to protect lives.

**Key Words:** social media, spatial analysis, shooting, Kent State

## GEOSPATIAL ANALYSIS OF NITROGEN REMOVAL BY RIPARIAN BUFFERS IN THE CHRISTINA RIVER BASIN

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### **Abstract**

Extensive farming can degrade nearby surface waters through the augmentation of nutrient (e.g. nitrogen) and sediment transport. Riparian buffer systems are known to mitigate these impacts through plant uptake and denitrification. The ability of riparian buffers to remove nitrogen

depends on hydrology, upslope cropland area, and other factors that vary by location. The objective of our study is to examine spatial variations in the ability of riparian buffers to remove nitrate from subsurface flow and identify priority locations for restoration. We compare three intensely farmed watersheds in three different physiographic provinces in the Delaware River Basin: Appalachian Mountain (AM), Piedmont (PD), and Coastal Plain (CP). We used a combination of methodologies including geospatial analysis, empirical methods (water quality sampling) and statistical modeling. Our research utilizes and expands on a geospatial tool developed by Baker et al. (2006), a quantitative model developed by Sweeney and Newbold (2014), along with other model developments. Our results show that through the combination of these models and with incorporating topographic wetness and subsurface flow connectivity, we can more accurately identify buffer effectiveness. With these improvements, the prioritization of riparian buffer restoration can better assist watershed managers in developing strategies to reduce nitrogen export and improve water quality.

**Key word:** nitrogen, riparian buffer, water quality, watersheds

## GIS ANALYSIS OF DEPRESSION AMONG TWITTER USERS

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### Abstract

Depression is a common chronic disorder. It often goes undetected due to limited diagnosis methods and brings serious results to public and personal health. Former research detected geographic pattern for depression using questionnaires or self-reported measures of mental health, this may induce same-source bias. Recent studies use social media for depression detection but none of them continue examining the geographic patterns. In this paper, we combine GIS with social media to provide new perspectives for public health research. We build a model to automatically detect depressive users in Twitter and analyze their spatial patterns using GIS technology. This method is a compensation for technique diagnosis of depression. It is faster at collecting data and more promptly at analyzing and providing results. Also, this method can be expanded to detect other major events in real-time, such as disease outbreaks and earthquakes.

**Key words:** depression, tweets, clustering, GIS, social media

## GIS BASED INDUSTRIAL CITY ECONOMIC REVIEW

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### Abstract

The Economic Review is to know performance of economic conditions of a city and this analysis is helpful in the management of different economic aspects of the city for City Administrators. Geographical Information System (GIS) based Yanbu Industrial City

Economic Review is introduced by the Strategic Planning and Investment Dev. Division, Economic Planning Dept. This review covers a number of important economic terms such as National Gross Domestic Product (GDP), Foreign Direct Investment (FDI) and Royal Commission (RC) dedication to it, RC and non-governmental sector total expenditures, Population, Industry Growth, Employment, City Land Budget, Property Sale & Rental Market Rates and other useful economic metadata.

Approach consists of data received from the City, RC Riyadh, and Investors including other statistical sources as well as other concerned local & International sources. Methodology consists of field surveys, visits and interviews with the relevant sources, tenants & property owners and the data is processed in CAD Civil 3D & GIS software. The main purpose is to know best and more recent understanding of the City Economic Performance. Top important objectives of this review are as follows: To keep an eye on City Economic Trends periodically; to know the changes in the economic statue of the city over the period of time and to produce Economic Awareness.

**Key words:** Economic Review, Geographical Information System (GIS), Gross Domestic Product (GDP), Royal Commission (RC), CAD Civil 3D, City Economic Performance

## GROUNDWATER CONFIGURATION IN THE UPPER CATCHMENT OF MEGHADRIGEDDA RESERVOIR, VISAKHAPATNAM DISTRICT, ANDHRA PRADESH, INDIA

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### Abstract

The study area, the Meghadrigedda reservoir catchment is covering about 374 km<sup>2</sup> falls in Visakhapatnam and a small upper part is in Vizianagaram District, Andhra Pradesh, India. IRS-ID-LISS-III satellite data of 2007 have been used to generate thematic maps of lineaments, geomorphology and land use/land cover revealing spatial distribution and usage pattern of groundwater. The up-stream of Meghadrigedda reservoir has a number of minor domal structures of different elevations besides structural hill masses acting as ridges and conduits in occurrence of groundwater. The area comes under Eastern Ghats Mobile Belt (EGMB) covered by weathering prone khondalite suite of rocks. Owing to anthropogenic activities, drainage and geomorphological conditions are altering in the reservoir catchment. The major lineaments delineated on toposheet, considering the major and structurally controlled drainages which are having significance in groundwater distribution. The groundwater levels had been monitored in 20 dug wells during the pre- and post-monsoon in 2010. Eight Vertical Electrical Soundings (VES) had been carried out in selected geological and geomorphic classes with a view to delineate potential aquifer zones. Study was carried out with a view to establish reservoir influence on groundwater configuration. Interestingly that the wells located near the reservoir in hilly areas has shallow water table than the wells in broad valley. Groundwater in the area is not been influenced by reservoir in the upper catchment.

**Key Words:** Reservoir, Vertical Electrical Soundings, Geomorphology, Lineament

## HALLOWEEN 2013: ANOTHER “100-YEAR” STORM AND FLOOD IN CENTRAL TEXAS

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### Abstract

On Halloween 2013, central Texas was hit by the fourth flood event in 15 years to have “100-year event” ascribed to its 24-hour precipitation amounts and flood discharges. Major flood damage occurred near the confluence of the Blanco and San Marcos Rivers and along Onion Creek in Austin. We analyzed the precipitation and discharge values in light of traditional and updated models. When considered in light of updated criteria, the maximum 24-hour precipitation was between a 50 and 100 year event, and most stations in the flood area received between 10 and 50 year amounts. Flood peaks included the third largest for Onion Creek at U.S. 183 (321mi<sup>2</sup>) at 135,000 ft<sup>3</sup> /sec, since 1969, and the fourth largest since 1929 for the Blanco River at Kyle (412 mi<sup>2</sup>) at 103,000 ft<sup>3</sup> /sec. When compared to historically-based regression models for designated flood discharges, mostly rural areas had 25 to 100 year peaks, whereas gages in recently urbanized areas received discharges greater than the modelled 100-year event. Along Onion Creek flooding occurred over 63 percent of the recently updated FEMA 100-year floodplain. Our conclusion is that a present day 25-year storm produced what *used to be considered* a “100” or even, a “500 year” flood.

**Key word:** Texas floods, precipitation frequency, flood hazard

### HEART DISEASE DEATH RATES IN *LOW* VERSUS *HIGH* LAND ELEVATION COUNTIES IN THE U.S. \*

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### Abstract

Death rates tend to differ according to different land elevations. In this study, U.S. states with non-overlapping land elevations were categorized as having either a relatively “high” or “low” land elevation. Using an ecological design, age-adjusted heart disease death rates (HDDR) in the U.S. corresponding to *high* land elevation counties in these states were compared to HDDR corresponding to *low* land elevation counties using the two-sample *t*-test and effect size statistics. HDDR corresponding to *high* land elevation counties were lower than HDDR corresponding to *low* land elevation counties ( $p < 0.001$ ; effect size  $> 0.70$ ). Explanations for this finding may pertain to the body’s striving to successfully adapt to stressors that accompany higher altitudes. Stressors corresponding to higher land elevations include higher levels of natural background radiation and decreased oxygen concentration. Since this is an observational study, no causal inference is claimed. Further research is indicated to verify these findings.

**Key Words:** Altitude, heart disease, death rates, epidemiologic methods

\* Full paper currently in review at the *Dose Response* journal

### HISPANIC POPULATION IN WASHINGTON STATE: DEMOGRAPHIC CHANGE AND SPATIAL CLUSTERING

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## Abstract

Hispanic population across the United States reflects rapid growth along with changing patterns of immigration. For example, persons of Hispanic origin constituted 12.5 percent of the total population in 2000, a figure that grew to an estimated 16.9% in 2012. The work presented here also represents recognition of Hispanic population distribution in areas not historically identified with those populations, including the State of Washington and the Pacific Northwest. The fact that Hispanic population in Washington expanded from 4.4 percent of total population in 1990 to 11.2 percent in 2010 justifies this attention.

Literature discussing Hispanic/Latino immigration has emphasized the states that share a common border with Mexico from Texas to California, along with Colorado and Florida. Recent literature has also recognized Hispanic/Latino immigration and its impacts on communities in the Midwest and along the East Coast. Attention to the Pacific Northwest has been minimal, even though there is a long history of Hispanic/Latino immigration, settlement, and participation in the Pacific Northwest, linked particularly to agriculture in Washington and Oregon.

This paper aims to begin to fill gaps in the literature on Hispanic populations in the Northwest by mapping and describing Hispanic population change in counties across the state of Washington since 1990. A further aim is to examine spatial clustering of Hispanic populations within the State at a more detailed (Census Block Group) level.

This initial study is part of a broader research effort to identify population change and critical issues facing Hispanic residents in Washington and to develop initiatives for greater awareness and engagement of Hispanics in Latino community place-making.

### *Data Sources:*

US Hispanic Origin 2012. U.S. Bureau of the Census, Population Estimates Program (PEP). Updated annually. <http://www.census.gov/popest/estimates.html>.

US Hispanic Origin 2000. U.S. Census Bureau, Census 2000 Summary File 1, Matrix P8. Accessed on:

[http://factfinder2.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=D EC\\_00\\_SF1\\_DP1](http://factfinder2.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=D EC_00_SF1_DP1). Accessed on 06 June 2014.

WA Hispanic Origin 2010. U.S. Census Bureau, Census 2010 Summary File 1, Matrix P8.

WA Hispanic Origin 1990. U.S. Census Bureau, Census 1990 Summary File 1, Matrix P8.

## HORIZONTAL ACCURACY ASSESMENT OF GLOBAL POSITIONING SYSTEM DATA FROM COMMON SMARTPHONES

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## Abstract

Smartphones have become ever-present in our lives since the launch of Apples iPhone in 2007. Since then the number of smartphones on the market today has climbed to over a billion worldwide. Many are attracted to the myriad of apps that these devices offer, including location based services (LBS) that allow users to track their current location. In this study we seek to establish some preliminary results concerning the horizontal accuracy of several common

smartphones. Many of the devices used in this study represent several generations of the same device with developmental and technological upgrades differentiating them from one another.

Location coordinate data were collected utilizing volunteer students and their smartphones in the study and compared to RTK corrected benchmarks to assess horizontal accuracy. Each benchmark represented different types of local obstruction that have plagued traditional GPS receivers for years. The objective is to create some preliminary results of smartphone LBS accuracies that can be used as a baseline in future studies.

**Key words:** GPS, A-GPS, smartphone, horizontal accuracy

## HURRICANE DYNAMICS AND RISK PERCEPTIONS: A CASE STUDY OF HURRICANE IRENE IN NORTH CAROLINA

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### Abstract

Perception of risk to natural hazards is a complex topic affected by cognitive, situational, and contextual factors. Hurricane Irene presents an interesting case for evaluating how changes in environmental characteristics influence perceptions. Using surveys of residents in the Inner and Outer Banks of North Carolina, this study explores how changes in a hurricane's intensity influenced perceptions of hurricane related risks. Mail-out surveys that included maps of official advisories were sent to neighborhoods, categorized by location (Inner and Outer Banks) and impact (wind or surge). Questions centered on the extent to which the change in category influenced respondents' perceptions of their risk and likely impacts. Survey response rate was just under 30%, with a rather even distribution from the targeted areas. Little difference was found between the Inner and Outer Banks locations such that all reported the intensity influenced their perceptions by reducing the sense of risk. This varied somewhat, but not significantly, by hazard area. Specifically, the down-grading of Hurricane Irene created a false sense of security. Residents of the study area believed themselves to be at low risk and were unlikely to evacuate, despite warnings. The long duration of the event, however, led to significant damages, surprising many, and suggesting the need to emphasize impacts in messaging, no matter what the storm intensity.

## IMPACT OF NATURAL PROCESSES AND HUMAN ACTIVITIES ON GROUNDWATER QUALITY IN NEGOMBO-MUTHURAJAWELA REGION IN SRI LANKA

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<sup>4</sup> School of Environment, Science and Engineering, Southern Cross University, Australia (Visiting student)

### Abstract

Groundwater is an essential and finite resource in the world. Numerous knowledge gaps remain in the understanding of groundwater resources in Sri Lanka mainly due to the lack of accurate data. The purpose of this study is to assess the water quality in groundwater and its spatial distribution in Negombo-Muthurajawela area in Sri Lanka. The data collection was conducted at the beginning and at the end of South West Monsoon (May and September respectively) in 2013. A pilot survey was carried out using 116 dug wells. A total of 31 dug wells were selected for physio-chemical analysis. *In situ* field-testing of Electrical Conductivity (EC), salinity and pH were carried out and laboratory tests were performed for  $\text{HCO}_3^-$ ,  $\text{Na}^+$ ,  $\text{K}^+$ ,  $\text{Ca}^{2+}$ ,  $\text{Cl}^-$ ,  $\text{SO}_4^{2-}$ ,  $\text{Mg}^{2-}$ ,  $\text{PO}_4^{3-}$ ,  $\text{NO}_3^-$  and Total Hardness (TH). Principle Component Analysis (PCA) was performed to assess water quality and interpolation technique in ArcGIS was performed to analyse and prepare spatial distribution maps of water. Sri Lankan standards for drinking water were used to determine the threshold levels of physiochemical parameters. The results of the PCA reveal that 31 observation wells can be classified under three main components: the first based on the impact on EC,  $\text{HCO}_3^-$ ,  $\text{Na}^+$ ,  $\text{K}^+$ ,  $\text{Cl}^-$ ,  $\text{Mg}^{2-}$ , and TH; the second component considering the pH,  $\text{HCO}_3^-$ ,  $\text{Ca}^{2+}$ ,  $\text{SO}_4^{2-}$ ,  $\text{PO}_4^{3-}$  and TH and the third component based on  $\text{NO}_3^-$ . These three components evidence the role of salt water intrusion, the influence of Muthurajawela wetland and the anthropogenic discharges on groundwater quality in Negombo-Muthurajawela area.

## INTERNATIONALIZATION OF RETAILING: THE CASE OF TURKEY

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### Abstract

One of the key trends in retail trade in the last 50 years has been a far reaching internationalization with retail chains entering new international markets to increase the scale of their business operation. Series of push factors in the home market and (perceived) pull factors in destination markets can trigger international trade activity among retailers, whereas the organizational context and the international political economic context either facilitates international activities or blocks them. In general, a combination of market scale and market growth strengthens the position of any market to become a destination market for international retailers. Since the mid-1980s, Turkey went through a phase of rapid economic transition, accompanied by a phase of unprecedented economic growth in the last 12 years. Fulfilling the basic criteria of combining scale and growth, Turkey became an important target market for international retailers, with many players entering the market with different strategies. A phase of fast development of shopping centers facilitated the market entry and expansion for many international retailers. However, quite a few retailers also left the market after several years of operation, an indicator of the complexity of the market. Also, a number of Turkish domestic retailers decided to go international. This paper discusses the trend of retail internationalization in Turkey, focuses on the complexity of the market, and puts the case of Turkey in an international theoretical framework.

**Key words:** retail, internationalization, real estate, Turkey

## LANDSCAPE ECOLOGY, URBAN MORPHOLOGY, AND CBDs: AN ANALYSIS OF THE COLUMBUS METROPOLITAN AREA

## Abstract

Landscape structure indices, derived from landscape ecology theory, are widely used in ecological studies. Research has shown that these indices are able to capture the degree of human manipulation of the landscape. They have been applied in ecological and environmental studies. In metropolitan regions, central business districts (CBDs) are proven to possess enormous impact on human settlement; thus, CBDs can impact urban landscape and land use patterns. Distances to major centers might play an important role in explaining the urban land use patterns and landscape indices. However, there has been no research as to whether landscape indices, as measures of land-use structure, may be influenced by distance to major CBDs. This research attempts to bridge the gap in the literature by measuring the influence of CBDs into landscape indices, derived from landscape ecology. The research hypothesis is that urban centers have a significant impact in explaining land use pattern, measured by landscape indices. This hypothesis is examined by analyzing the statistical relationships between many landscape indices and the distances to multiple CBDs in the case of the Columbus Metropolitan Area. Landscape indices are computed for all zones in the Columbus Metropolitan Area. Urban morphology is studied through the whole metropolitan area by using GIS analysis. Statistical models are built to explore the relationship between the distance to the metropolitan central business district (CBD) and landscape indices. Overall, the results provide evidence of the importance of the role of CBDs on the landscape indices. Despite the suburbanization of the area, the metropolitan CBD still have significant impacts on landscape indices in most cases.

**Key Words:** quantitative analysis, Landscape indices, CBDs

## LOCATIONAL INTELLIGENCE AND SPATIAL THINKING – A PANEL DISCUSSION ON THE CONCEPTUAL FOUNDATIONS OF OUR DISCIPLINE

*Organizer(s):* Murray D Rice - University of North Texas, Tony Hernandez - Ryerson University

*Chair(s):* Murray D Rice - University of North Texas

*Panelist(s):* Tony Hernandez – Ryerson University, Linda Peters – Esri, Lawrence Joseph – West Marine, Grant Thrall – Business Geography Advisors, Bill Black – Louisiana State University, Larry Carlson – Carlson & Associates

**Session Description:** Locational intelligence (also known as business geography) is a field that applies geographic concepts, skills, and technologies in support of improved organizational decision-making. The future of locational intelligence depends on geographers making the case that we have a unique contribution to offer businesses and other organizations. Thus, it is critical that locational intelligence researchers and practitioners have a clear understanding of the basic concepts that define the field's core analytical approaches. One prominent focus in previous discussions is the idea that "spatial thinking" comprises a fundamental component of this core. What do we mean by spatial thinking? This panel session provides a forum for the exchange of ideas as we seek to define spatial thinking and better communicate the core approaches and contributions offered by the locational intelligence field.

### Seed questions for discussion:

1. How can we best define "locational intelligence" and "spatial thinking"?
  - a. Definitions and related terms and concepts

- b. Examples
2. Who should care about locational intelligence and spatial thinking, and why?
  - a. How can experts working in the field make the best case possible for organizations to invest in locational intelligence and spatial thinking capabilities?
  - b. How can locational intelligence or spatial thinking be considered as a “value added” asset within the business and organizational management community?
3. What is the next step we can take as geography faculty, practitioners, and students to build more and better career opportunities in the locational intelligence field?

## LYME DISEASE IN TEXAS? ENHANCING PREVENTION THROUGH THE IDENTIFICATION OF AREAS OF RISK

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### Abstract

Lyme disease, currently the most common vector-borne disease in the United States, is an infection caused by a spirochete bacterium known as *Borrelia burgdorferi*. The bacteria are transmitted to humans through the bite of an infected tick. Failure to diagnose and treat aggressively can lead to disability or death, thus early detection and treatment is critical. However, Texas and other areas in which Lyme disease is not considered endemic have been largely ignored by informative, preventative and diagnostic efforts. As a result, many patients are left with few resources for diagnosis and treatment and must travel out of the region at great personal time and expense to receive the necessary care. The purpose of this study is two-fold: (a) to improve understanding of the prevalence of Lyme disease in Texas and (b) to identify the potential risk areas through habitat mapping of the vector. Prevalence of Lyme disease in Texas will be visually demonstrated using incidence reports and voluntary surveys. Statistically significant areas of disease will be identified using Exploratory Spatial Data Analysis. Conditions necessary for preferred tick habitat are also examined and applied to construct suitability ranges within the state. Identifying potential risk levels and hotspots of Lyme and other vector-borne diseases in previously overlooked regions allows greater awareness, faster diagnostics, and improved prevention techniques, all of which contribute to better quality of life.

## MAPPING PATTERNS OF MARINE DEBRIS ON CAYE CAULKER, BELIZE

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### Abstract

The presence of marine debris on beaches is unsightly, environmentally destructive, and is regrettably driven by human activity. This global phenomenon is challenging to address, particularly in countries such as Belize where infrastructure for refuse disposal is limited, and yet ecosystem health is critical for economic success. Our work examined the distribution of debris on the small island of Caye Caulker in Belize, in an effort to provide baseline

information for monitoring using GIS as part of a study abroad course. Caye Caulker is five miles in length, has a population of over 1500 people, and in recent decades has shifted from a historical reliance on fishing to an increased focus on tourism, in part due to the proximity of the Belize Barrier Reef.

Teams of students from Georgia State University and Ocean Academy collected data at several sites on the island documenting the composition and distribution of litter found on beaches following the methods of Bennett-Martin et al. (in review). In addition, evidence of illegal dumping of trash on roadways and the location of public receptacles for garbage were recorded. Both locals and visitors to the island were surveyed for their perceptions regarding issues related to marine debris. Map analysis revealed differences in the concentration and materials found across the island from north to south. Although shoreline litter had been reported previously by the community in beach clean-ups, documentation of the problem using GIS can aid in more effective management of high impact areas on Caye Caulker moving forward.

**Key Words:** GIS, community geography, marine GIS, mixed methods, marine litter

## MEASURING CROPLAND CHANGE: A CAUTIONARY TALE

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### Abstract

Remotely sensed (RS) imagery has been used for decades to quantify the area, rates, and types of land use and land cover change (LULCC) from local to global scales. Common platforms used to capture data include satellite- and aerial-based sensors and cameras. Inseparable from those data are errors – misclassified pixels in sensor-based data or incorrect observations in aerial photographs – created by spectral confusion on the part of the sensor or by misclassifying the raw data during interpretation. Such errors, if not sufficiently explained and/or taken into consideration when reporting LULCC results, may lead to dubious conclusions. For this paper, four commonly used and readily available datasets were analyzed to determine the amount of cropland change in South Dakota from circa 2006 to 2012. Two of the four datasets (the National Land Cover Dataset and the Cropland Data Layer) were created from satellite-based sensors; one was created from photographic data (from the National Agricultural Imaging Program); and the fourth was a survey-based assessment of agricultural land use (Census of Agriculture). Depending upon which classes were used or how the data were manipulated prior to calculating areal totals, South Dakota had between 13 million and 19 million acres of cropland in 2012 – a difference the size of the state of New Jersey – with rates of change from 2006 to 2012 ranging from 0.28% to 22.65%.

**Key words:** remote sensing, land use and land cover change, cropland

## MEASURING RESIDENTIAL GREENSPACE ACCESS IN A RURALLY-SITUATED URBAN AREA: AN OBJECT-BASED DATA FUSION APPROACH

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### Abstract

Public health studies have identified access to greenspace as a contributing factor in both physical and mental health. In urbanized areas, greenspace is often a rare commodity, and hence, economic status may determine access to greenspace. The majority of previous studies have examined well-established, urban areas, with little historic data with which to compare change over time. This study establishes a baseline of greenspace access in a semi-urbanized location, positioned within a rural region that is experiencing rapid urbanization. This baseline serves as a point of comparison for future studies that examine urbanization, greenspace, and public health. This study employs object-based data fusion methods, including NAIP imagery, LiDAR, parcel boundaries, and economic data at the block-group level to establish not only landcover classification but residential access to greenspace categorized by median income in Gainesville, Georgia.

## METHODOLOGIES TO SUPPORT A REENGINEERED ADDRESS CANVASSING FOR THE 2020 CENSUS.

Michael Ratcliffe, US Census Bureau

### **Abstract**

This paper reports on work within the Census Bureau to compile data, classify census blocks, and develop statistical models to support a reengineered approach to address canvassing for the 2020 Census. The Census Bureau conducts address canvassing to assure an accurate and comprehensive address list to support decennial census operations. The Census Bureau conducted a full address canvassing operation prior to the 2010 Census, with field workers traversing every road in the nation to verify and update addresses in its Master Address File (MAF). The Census Bureau is considering selective in-field canvassing for the 2020 Census, focusing on areas in which the currency and completeness of the MAF cannot be assured through use of various datasets, such as the USPS's Delivery Sequence File or local government address lists as well as geospatial data and imagery. In-office methodologies would be employed to validate the accuracy and completeness of the address list for the 2020 census for much of the nation. In this presentation, I report on the ways in which geographical analysis and statistical modeling will be used in a decision support process.

**Key Words:** Decennial Census, Census Bureau, geospatial data

## MEXICO'S SMUGGLING NETWORK: A SIMULATION OF THE DRUG CORRIDORS TO THE UNITED STATES

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### **Abstract**

Drug smuggling routes are closely tied to geography and the related costs of traversing different areas from production regions toward destinations where the illicit product can be sold. This study analyzes Mexico's ground trafficking corridors for marijuana and opium derivatives using network analysis as a basis to determine shifts in the paths drugs follow to minimize associated monetary and socio-political costs.

Network algorithms to determine the shortest path between one origin node to a destination node along a network analyze costs represented as a friction surface to traverse.

This study used the Dijkstra algorithm to find the least costly path in Mexico's road network to go from municipality to municipality while moving toward destination points identified as American cities at the border with Mexico.

The friction grid includes distance from the cultivation areas to the destination sites, as well as scaled added costs per municipality based on the quality of the roads measured by number of lanes and classified according to if they are paved, population and police density, land cover, poverty levels, drug-related killings, and recent confiscations of marijuana and opium derivatives that have occurred in particular municipalities. This cost surface was assembled using Weighted Linear Combination (WLC).

The results showed that the current divisions of territories among different drug organizations have a geographic component. In fact, they have created smuggling corridors in areas that grant them access to the least costly routes connecting production areas with U.S. destination points, without passing throughout hostile territories controlled by other gangs.

**Key words:** drug trafficking, drug routes, road network, simulation

## MOBILE MAPPING AND PUBLIC PARTICIPATION TO UNDERSTAND URBAN GREENSPACE ACCESSIBILITY IN ATLANTA

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Leah Rogstad, University of Vermont

Emily Christenson, University of Wisconsin-Eau Claire

Timothy Hawthorne, Georgia State University

### Abstract

During a six week summer Research Experience for Undergraduates (REU) site, the 2014 Georgia State University Community-Soil-Air-Water (CSAW) scholars worked in collaboration with the West Atlanta Watershed Alliance (WAWA) to better understand issues of access and usage of urban greenspaces. A mixed method research design provided the theoretical framework for this multidisciplinary study of the Cascade Springs Nature Preserve in Atlanta, GA. Students developed an electronic survey, neighborhood canvassing strategy using iPads and in-depth interviews to explore community residents' perceptions of the local urban greenspace. The final products produced by the summer REU also included an innovative strategy for community outreach and an updated, user-friendly ArcGIS application of the nature preserve. The community-identified data can potentially be used by WAWA and its strategic partners to advocate for grants and other funding to improve features and conditions within the park i.e. lights and other safety features. These improvements coupled with outreach activities and better communication with local residents can also potentially address gendered and age-related barriers to greenspace usage and the historical disinvestment in Atlanta African American communities. The overall findings highlight the growing importance of cross-disciplinary research teams and the applicability of theories of communication dissemination to urban greenspace literature. Most importantly, the findings demonstrate the potential for undergraduate summer research to serve as an impetus for social change.

**Key words:** community geography, accessibility, urban geography, greenspace, mixed methods

## MONITORING ENVIRONMENTAL CHANGES AT A LOCAL SCALE USING REMOTE SENSING AND GIS: CASE STUDY IN SMALL PROTECTED AREAS OF NORTHERN CAMEROON

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### Abstract

At the global level, land use land cover changes (LULCC) are the most important element among disruptive ecological systems (Gillandus et al, 2008; Verburg et al. 2006; Vitousek, 1994). Their impact on the environment can be equivalent to certain factors pertaining to climate change. Among the measures taken to control these processes, the creation of protected areas is one of the most relevant. It is supposed to limit the scale of changes of land use land cover, in order to conserve space called "natural" or to promote their sustainable management through conservation policies. However, in areas with fragile ecosystems subject to significant population growth and the associate pressure agro-pastoral, protected areas can rapidly and irreversibly transformed into areas of rural activities. This is the case of protected areas in northern Cameroon where there LULC facies changes since the 1990s (Wafu Tabopda et al., 2009, 2008, 2005; Ntoupka et al., 2006).

This paper focuses on monitoring changes in land use land cover change in protected areas at local level, concerned with environmental changes as a factor for evaluating conservation policies implemented. It specifically highlighted through remote sensing and GIS, changes in land use land cover observed in the Mozogo National Park and Kalfou Forest Reserve, then analyze the explanatory factors. The goal is to decipher the interactions between protection strategies and local activities.

**Key words:** protected areas, remote sensing, GIS, LULCC, northern Cameroon, National Park, Forest Reserve

## MULTILEVEL BUILT ENVIRONMENT FEATURES AND INDIVIDUAL ODDS OF OVERWEIGHT AND OBESITY IN UTAH

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### Abstract

Based on the data from the Behavioral Risk Factor Surveillance System (BRFSS) in 2007, 2009 and 2011 in Utah, this research uses multilevel modeling (MLM) to examine the associations between neighborhood built environments and individual odds of overweight and obesity after controlling for individual risk factors. The BRFSS data include information on 21,961 individuals geocoded to zip code areas. Individual variables include BMI (body mass index) and socio-demographic attributes such as age, gender, race, marital status, education attainment, employment status, and whether an individual smokes. Neighborhood built environment factors measured at both zip code and county levels include street connectivity, walk score, distance to parks, and food environment. Two additional neighborhood variables,

namely the poverty rate and urbanicity, are also included as control variables. MLM results show that at the zip code level, poverty rate and distance to parks are significant and negative covariates of the odds of overweight and obesity; and at the county level, food environment is the sole significant factor with stronger fast food presence linked to higher odds of overweight and obesity. These findings suggest that obesity risk factors lie in multiple neighborhood levels and built environment need to be defined at a neighborhood size relevant to residents' activity space.

**Key Words:** overweight, obesity, built environment, multilevel modeling, zip code, county, Utah

#### NEW CENTER-PERIPHERY DIFFERENTIATION: URBAN RESIDENTIAL SPATIAL RESTRUCTURING OF DIFFERENT CLASSES IN CHENGDU, CHINA

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#### Abstract

We study urban residential spatial restructuring driven by the massive migration and/or relocation of different social classes at the city wide after the reform and opening-up in China. Employees hired by state government departments and related branches (*shiye danwei*, including universities, schools, hospitals, and other social service units) are neglected in urban residential spatial restructuring. Bridging the empirical research gap and using Chengdu as a case study, this paper compares residential relocations of employees in government departments (EGD) and urban demolition crowd (UDC) in Chengdu. Our analysis based on field survey performed from 2009 to 2013 at Chengdu indicates that the relocations of EGD and UDC are spatially agglomerated respectively. A new center-periphery differentiation has been formed from late 1970s to 2013 under China's unique dual-track mechanism composed of market force and government power, which has led into urban residential spatial restructuring. The study shows that government power differentiates residential relocations of EGD and UDC, and market mechanism reinforces it. A new center-periphery differentiation has been restructuring urban space: the poor and weak class is migrated more and more from urban center to fringe, and the rich and middle class represented by EGD is agglomerated close to urban center. Potential problems caused by the dual-track mechanism and the new center-periphery differentiation are finally discussed and summarized.

**Key Words:** Employees in government departments, Urban demolition crowd, Incomplete real estate market, market mechanism, Chengdu

#### OBJECT BASED LAND COVER EXTRACTION ON AERIAL PHOTOGRAPHS AND SOIL DATA FOR A WETLAND ON THE UPPER MISSISSIPPI RIVER

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#### Abstract

An object-based feature extraction approach is investigated for identifying land cover/use (LCU) for the wetland area of Lake Odessa on Pool 18 of the Upper Mississippi River. Feature Analyst software is used to classify LCU types using 1-meter true color and color infrared orthophoto mosaics and soil survey data. The different types of images along with the addition of soil type data were used to evaluate the ability of object-based image analysis (OBIA) software to improve classification of LCU types. All LCU classes correspond to the USGS Long Term Resource Monitoring Program General Wetland Vegetation Classification System. Results indicate that an acceptable level of accuracy (>85%) for water and most wetland classes could be obtained using the CIR photography in combination with soils data. However, the true color photography did not prove to be efficient for the extraction of the desired LCU classes.

**Key words:** vegetation mapping, OBIA, feature extraction, Mississippi River.

## ONE STEP AT A TIME: COMMUNITY CHANGE IN COSTA RICA

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### Abstract

GIS has the potential to transform the world and impact lives of individuals who don't know the true power of GIS. Geoporter is a program where professional geospatial educators travel to communities around the world working hand-in-hand with members to use and apply geospatial technologies to solve local issues and investigate community resources. The first project location of Bahia Ballena-Uvita, Costa Rica is building the capacity to transition this small coastal town from farming and fishing to ecotourism, managing its own sustainable growth. The Bahia Ballena shoreline is the eastern (coastal) boundary of the Marino Ballena National Park; the first marine park and second most visited national park of Costa Rica. Geoporter is helping to bridge people's understanding of Bahia Ballena through the use of geospatial technologies (GPS and GIS) while connecting to global issues.

Since August 2012, Geoporter has been living and working with the Bahia community providing education assistance to local school teachers, youth, boat tour companies, guides and community members at large in refining their use of geospatial technologies in three main projects; participatory whale monitoring, clean streets, clean waters and equipping educators and youth with empowering technology. From these initial three projects, community members have identified new projects to apply their skills and technologies and have reached out to nearby communities to share their results as capacitate others.

## PERCEPTIONS OF STORMWATER MANAGEMENT AND BARRIERS TO GREEN INFRASTRUCTURE IMPLEMENTATION IN LANCASTER, PA

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### Abstract

Nonpoint source pollution remains a major problem for water quality in the Chesapeake Bay Watershed. As such, local efforts are underway to reduce the impact of stormwater runoff, identified as a leading cause of degraded water quality. Green infrastructure has been embraced

by some communities as an effective means to reduce stormwater discharges to local waterways. This study examines the public perceptions of stormwater management and local green infrastructure improvements initiatives in Lancaster County, Pennsylvania. In late 2012, residents of two communities in Lancaster County were polled by telephone, and local public officials were interviewed using semi-structured surveys. Findings suggest that several barriers impede the implementation of green infrastructure. A discussion will address means to overcome some of these barriers.

## PERSONNEL TERRAIN: THE GEOGRAPHY OF MILITARY PERSONNEL MANAGEMENT

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### Abstract

The application of geographical thought in general and spatial analysis in particular to personnel management is an area that is not at all exploited neither in scholarly literature nor in applied or practical settings. Given that spatial analysis has made inroads into innumerable areas including natural resource management, business management and government services, it is odd that management of human resources has escaped the gaze of the “geospatial revolution”. Equally odd is the lack of focus of the geospatial industry on the management of human resources. The concept of the “geography of military personnel” attempts to address these gaps, both from scholarly and applied approaches, with a specific focus on military personnel management.

Canada’s Department of National Defence (DND), the bureaucratic arm of the Canadian Armed Forces (CAF), has developed a geospatial analysis capability within its Military Personnel Command for the purposes of conducting research and analysis in support of individual, operational and organizational effectiveness. The capability has been coined as “Personnel Terrain” and functions as shorthand for the “geography of military personnel”. Personnel Terrain employs both quantitative and qualitative spatial analysis methods. Personnel Terrain’s capability enables DND to explore and examine those social, economic and demographic spaces and places where the CAF and Canadian society meet.

We present the theoretical underpinnings of the “geography of military personnel” and demonstrate the application of “Personnel Terrain” through a variety of actual applied research and analysis projects carried out between 2009 and the present for Canada’s Department of National Defence and the Canadian Armed Forces

**Key words:** military personnel, spatial analysis, organizational effectiveness

## PLASTICS, POLLUTION, AND PEOPLE: MAPPING MARINE DEBRIS IN COASTAL COMMUNITIES ACROSS BELIZE

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### Abstract

Geographic Information Systems (GIS) has immense usability for both understanding problems of marine debris and managing it with community participation. Although numerous studies report on the impacts of marine debris, there are fewer examining the dynamics of spatial relationships using GIS on beaches.

This study is the first to examine marine debris in coastal communities of varying densities and industries using GIS throughout the country of Belize. Marine debris tracked in this research as found on beaches included glass, metal, styrofoam, fishing debris, and plastics. Of the four communities analyzed (San Pedro, Caye Caulker, Punta Gorda, Monkey River), plastics were the most abundant material observed. San Pedro and Caye Caulker featured similar patterns in volume, while Monkey River and Punta Gorda, in the southern district of Belize, yielded very different patterns. Documentation of items revealed that specific forms of debris such as bags and bottles were most prevalent. The map design process for the data collected in this work was created by statistical analysis of abundance. This analysis was then visualized through critical cartographic processes to reflect details of each point of data.

This research sets a baseline framework for monitoring and future actions for addressing coastal marine debris issues at varying spatial scales. GIS was an efficient means of collecting accurate and extensive quantitative and categorical data on litter across beaches. These data allowed for use of critical cartographic representations that will be beneficial to coastal communities of Belize for education and management purposes related to marine debris issues.

**Key words:** GIS, community geography, marine GIS, critical cartography, marine litter

## POLITICAL GEOGRAPHY OF INFRASTRUCTURE ACCESS IN NIGERIA: EVIDENCE FROM SPATIAL DATA: ANALYSIS OF INFRASTRUCTURE ACCESS ACROSS LOCAL GOVERNMENT AREAS

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### Abstract

Unequal access to public infrastructure services in Nigeria motivates further examination of the role of political geography in shaping differential access to infrastructure in the country, particularly in relation to its infamous 'North-South' divide. Lack of detailed micro-level data has often impeded accurate assessment of the spatial distribution and association of infrastructure access in the country, which, thanks to an extensive survey conducted by the Nigerian government's Office of the Senior Special Assistant to the President on MDGs (OSSAP), is remedied in this study with an examination of infrastructure access at the smallest administrative unit available in the country, the local government area (LGA). In this paper, we employ spatial statistical techniques along with a geographic information system (GIS) to examine the spatial autocorrelation of power, sanitation and water non-access across 68,627 mostly public primary schools for 764 of 774 LGAs in Nigeria. We find evidence for the existence of LGA clusters of infrastructure poverty, aligned along geopolitical zone. Our results also reveal a significant cluster of LGAs in the North-West zone, the zone with the highest income-based poverty rate in the country, outperforming both Northern and some Southern peers on all access indicators, contradicting previous narratives of pervasive Northern underperformance based solely on an assessment of income-based poverty rates. Our results hold up to multiple testing correction, controlling the false discovery rate using the Benjamini-Hochberg procedure. These results highlight the need for a spatially targeted policy approach,

at finer spatial scales, to poverty reduction efforts through infrastructure access expansion in the country. They also point to evidence for geopolitically based structural infrastructure poverty and inequality of access in Nigeria and have important implications for future study on the role of geography and institutions in shaping access to public services in the country.

**Key Words:** Spatial autocorrelation, clusters, infrastructure access, Local Government Area, geopolitical zone, Nigeria

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With special thanks to members of Nigeria's OSSAP, Shaky Sherpa, Salah Chafik, Prabhak Pokharel, Chris Natali and the members of the NMIS project at the Modi Research Group at Columbia University for the survey data used in this study

## SOCIOECONOMIC INEQUALITIES OF CHILDHOOD OBESITY AND FOOD ENVIRONMENTS

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### Abstract

Childhood obesity rates are greater in low-income and minority populations. In Alabama, nearly half of rural African American children are overweight or obese, compared to 34.8 percent of White children. It is imperative to understand the inequality patterns of childhood obesity and the underlying factors in Alabama's Black Belt region, where a high percentage of low-income rural Black population resides and socioeconomic disparities abound. This project aims to investigate the socioeconomic inequalities in childhood obesity and community food environments: (1) analyze the inequality patterns of childhood obesity; (2) assess food environments around children; and (3) examine the interactions between childhood obesity, food environments, and socioeconomic inequalities. Both qualitative and quantitative methods will be used in this research. We have collected data at seven elementary schools from three Black Belt counties. GIS-based spatial statistical methods will be used to assess community food environments and examine its impact on children's weight status.

**Key words:** Childhood obesity, food environments, Black Belt region, GIS

## POTENTIAL MANAGEMENT OF MOUNTAIN ENVIRONMENTS USING SUMMIT REGISTERS

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### Abstract

A common tourist activity in mountain landscapes is summiting the local highpoint of a region. Increased tourism and overall demand on mountainous regions, however, may have long-term consequences on visitor experience and environmental conditions. In some mountainous regions, a fee system has been proposed to limit overcrowding and reduce ecological damage. Although a payment system may limit overcrowding and environmental degradation, a fee

system may severely limit accessibility for certain socioeconomic groups. An alternative to fees may be educational programs/material to notify hikers of common hiking periods and inform tourists of possible environmental degradation. Educational programs and/or material, however, need to be targeted at specific individuals who access the mountains. Summit registers provide spatial and temporal information on the individuals to be targeted.

The summit register on Wheeler Peak, Nevada were obtained for the 12-month period of June 2012-May 2013. The location of origin for each hiker was digitized and mapped to reveal spatial clusters of hikers who accessed the summit. Date of summit was also used to identify common hiking times on the mountain. Results indicate the spatial and temporal patterns of hikers who summit Wheeler Peak are significantly clustered. The identification of these clusters through summit registers is currently an underutilized record of mountain users. Data contained in summit registers can provide important information to mountain managers and may assist with management of sensitive mountain environments and ensure continued enjoyment by mountain visitors.

**Key words:** Great Basin National Park, land management, tourism, mountain environments

## PRE-SERVICE TEACHERS AND GEOGRAPHY EDUCATION IN COLORADO

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### Abstract

There is concern that the social studies in general and geography specifically are not being taught well in K-12 schools. This paper is a discussion of the state of geography in the context of pre-service teacher training in Colorado. The availability of geography classes is variable among the fifteen institutions of higher education that train teachers. A synthesis of the availability of geography classes for pre-service teachers is presented with general recommendations about the modification of teacher education in Colorado.

**Key Words:** geography education, teacher education, Colorado

## PREVIOUS EXPERIENCE AND TORNADO PREPAREDNESS IN DEKALB COUNTY, ALABAMA

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### Abstract

Previous experience with hazards influences people's perceptions about hazards in a variety of ways. This paper investigates the influence of past experiences with tornadoes on preparedness for a tornado. A questionnaire survey study was conducted immediately following the April 2011 tornado disaster in DeKalb County, Alabama. Past experience characteristics included number of tornadoes, time (years) elapsed, seeing or hearing the tornado, seeking shelter, and experiencing damage. Tornado preparedness included owning a NOAA weather radio, participating in a tornado drill, having a tornado-resistant shelter on the premises (basement, underground shelter, or safe room), and having a plan for seeking shelter. The results will help emergency managers in developing education programs in communities recently impacted by a

tornado. The findings will also provide insight into aspects of household preparedness that would likely receive greater support from local residents in efforts to build resilience following a tornado disaster.

**Key words:** tornado, hazards, preparedness, previous experience

## PROJECTING REGIONAL SUSTAINABILITY TRENDS USING GEOSPATIAL ANALYTICS

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### Abstract

By definition, sustainability is a decision-centric concept that seeks to identify a set of conditions the environmental system can support in perpetuity without experiencing functional degradation. Although comparatively simple to understand in the abstract, sustainability carries an implicit temporal dimension that frustrates measurement and assessment. Managing the balance between the ideals of economic development and environmental quality over what remains a poorly articulated time horizon, however, complicates the decision making process and the realization of sustainability programs. Therefore, policy instruments with established sustainability goals require a means to track human progress and modify planning directives as regional development unfolds.

In this paper the role of geospatial analytics is examined as one approach to guide the measurement, assessment and projection of land use intensity metrics derived from moderate resolution satellite imagery. Geospatial analytics directs attention to large or complex data sets and the integration of GIS functionality with dynamic numerical modeling to uncover structures and trends in data that illuminate significant pattern of interest. Adopting this strategy in the context of sustainable development facilitates the pro-active thinking needed to implement sustainability agendas and formulates an expression of sustainability in a manner sensitive to its “future-oriented” nature.

**Key words:** sustainable development, geospatial analytics, planning, environmental assessment

## QUANTIFYING LOCATION SPECIFIC PHYSICAL ACTIVITY OF INDIVIDUALS THROUGH INTEGRATION OF GPS AND ACCELEROMETRY

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### Abstract

Recently, accelerometers have been widely used to measure physical activity, a significant factor in health outcomes. Accelerometer-based activity data are touted as an alternative to an unreliable self-report, but lacks contexts in which activity occurs. While GPS has been suggested as a promising tool for physical activity studies, gaps in GPS data pose challenges.

Gaps in GPS data can be filled to some extent, and contexts of physical activity can be inferred if GPS data is integrated with accelerometry data. Further, environmental determinants of health outcomes can be better understood if location specific physical activity data is integrated with GIS data (e.g., demographics, access to food, and exposure to pollution). Therefore, integrated measurement of physical activity through accelerometry and GPS allows for more objective (reliable and contextual) quantification of physical activity, and provides a starting point for understanding role of geographic contexts in health outcomes precisely.

We will present procedures for collecting location specific physical activity data through the integration of GPS and accelerometry. An informed consent was provided to participants who were asked to wear a GPS data logger (Qstarz BT-Q100XT) and a triaxial accelerometer (PamSys) for 48 hours. The GPS data logger collects track logs (spatial trajectory) of individuals in a pre-specified GPS logging mode, and the accelerometer measures body posture (sitting, standing, walking, lying). Data sets generated from both devices are processed and synchronized to examine how modality of physical activity is associated with type of location. Potential and challenges of integrating GPS with accelerometry will be discussed.

**Key words:** physical activity, GPS, accelerometry, health GIS

## RECHARGE ESTIMATIONS FOR LAGUNA POND AT FREEMAN RANCH, SAN MARCOS, TX

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### Abstract

Laguna pond is an irregularly shaped pond located on Freeman Ranch in the Edwards Aquifer Recharge Zone of South-Central Texas. To determine the potential usefulness of the Laguna pond for the management of Freeman Ranch, the pond's drainage area, storage capacity, and yearly water budget were determined using a Global Positioning System (GPS) unit and Geographic Information Systems analytical tools.

Preliminary analysis of the data revealed a negligible drainage area and a storage capacity of 3.71 acre-feet (161,608 cubic feet or 1,208,908.79 gallons) with a surface area of .29 acres (12,632 ft<sup>2</sup>). The preliminary water budget revealed a deficit of approximately 29 in/yr, which would require the ranch to pump 8.97 af/yr (2, 921,529.604 gallons/yr) to create a perennial pond.

The exorbitant amount of water required to maintain the pond makes the Laguna an unlikely candidate for utilization as a stock pond or source of recreation for the ranch.

**Key words:** pond, water budget, drainage area, water resources, storage capacity

## REGIONAL AND RACIAL DISPARITY IN PRETERM BIRTH PREVALENCE IN GEORGIA, 1995-2012

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### Abstract

Preterm birth (PTB), defined as a live birth with a gestational age of less than 37 weeks, is the leading cause of infant mortality in developed countries. Recent studies have shown increases in PTB rates through the 1990s and 2000s in the United States, especially in a few states in the southeast including Georgia. Although researchers have studied the epidemiology of PTB in several regions, the spatial-temporal patterns of PTB rates in Georgia remain largely unexplored. This paper examines the spatial variations of PTB prevalence in Georgia at the county level between 1995 and 2012. Spatial clusters are assessed using global Moran's I, local indicators of spatial association (LISA), and location quotients (LQ). For disparity analysis, comparisons are made between births classified by race (black vs. white) and by four levels of urbanization. Results indicated a steady increase in PTB rates for both black and white births of all four urbanization classifications from 1995 to 2007, followed by a general decline from 2007 to 2012 for all groups. More urbanized counties tended to have lower PTB rates than more rural counties when compared as groups. Spatial clustering of high PTB rates tended to occur in the southern portion of the state for both white and black births, growing more prominent in the south central region as time progressed. Alternatively, spatial clustering of low PTB rates tended to occur in counties located in the north and northeastern areas of Georgia. The findings from this exploratory research are expected to serve as the basis of further studies of PTB and its risk factors, as well as to more effectively allocating prenatal health care resources.

**Key Words:** preterm birth prevalence, disparity, exploratory spatial data analysis (ESDA), Georgia

## RESIDENTIAL PATTERNS OF KOREAN AMERICANS IN CHICAGO METROPOLITAN AREA: A LONGITUDINAL STUDY OF SPATIAL ASSIMILATION IN A MULTI-ETHNIC CONTEXT

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### Abstract

The city of Chicago is home to the fourth largest concentration of Korean Americans in the United States. It is estimated that four out of five Korean Americans in Chicago live in the suburbs. In this paper, we examine the extent of spatial assimilation of Korean Americans with both the “mainstream” Caucasian population, as well as other dominant minority groups--the African Americans and Hispanics. In addition to this, we look at the residential patterns of Korean Americans *vis-à-vis* other dominant Asian sub-groups. Most studies looking at assimilation or suburbanization of immigrants typically club “Asians” as a monolithic group. We unpack the “Asian” category into dominant sub-groups in Chicago—Chinese, Indians and Filipinos--and measure the degree to which Korean Americans are segregated/integrated with each of these groups. Using the Dissimilarity Index, our analysis examines spatial assimilation of Korean Americans in terms of their residential segregation/integration from 1970 to 2010 within a multi-ethnic context. Results indicate that in general, Koreans are becoming more integrated (less segregated) with the White population over the forty year time period in every major county where they were clustered; while they are generally more segregated from the Black and Hispanic populations. Among the dominant Asian sub-groups, Korean Americans tended to be more integrated with Chinese and Indian populations, and more segregated from the Filipino population.

**Key Words:** Korean Americans, residential segregation, spatial assimilation.

## SCALE AND PUBLIC HEALTH: MISSOURI'S CIGARETTE TAX RATE

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Kathleen Spears, Department of Natural Sciences, Northwest Missouri State University, Maryville, MO, 64468-6001.

### Abstract

Proposition B, which would have raised the tobacco tax in Missouri from 17 cents per pack to 90 cents, narrowly failed in the 2012 general election leaving Missouri with the lowest tobacco tax in the USA. Despite scientific and economic evidence demonstrating health and economic benefits of higher tobacco taxes, Missouri remains reluctant to cave into pressure levied by various organizations to raise the rate. There are eight other cigarette tax jurisdictions along Missouri's borders, and three of the states have per pack taxes of over one dollar. This presents an economic opportunity as Missouri border towns have become a destination for large cigarette purchases. Based on the competitive advantage Missouri cigarette vendors have over similar vendors in adjacent states, we intend to explore the results of the Proposition B vote to examine whether certain border areas were most strongly against the Proposition since it might hurt their local economy.

## SERVICE LEARNING TO ENABLE GEOGRAPHIC OBJECT BASED IMAGE ANALYSIS (GEOBIA) EDUCATION AND RESEARCH

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### Abstract

The rapidly growing availability of high spatial resolution remotely sensed data from multiple sensors is redefining remote sensing teaching and research. GEOBIA is emerging as the most effective technique to simultaneously analyze spatial, spectral and social data. Automated feature extraction is accomplished by developing rule-sets that operate on the imagery and geospatial information. As we enter the age of 'big-data', there is a large amount of free aerial, satellite and LiDAR data in the public domain along with novel forms of social data. This is a great impetus and opportunity for GEOBIA education and applied research that takes traction in local communities. The issues involved in integrating GEOBIA in undergraduate curricula will be discussed along with case studies of real-world projects done by the students.

## SERVING AND WORKING WITH DIVERSE COMMUNITIES THROUGH THE ATLANTA COMMUNITY MAPPING AND RESEARCH CENTER

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### Abstract

In this poster, we demonstrate the opportunities for and challenges to community geography and community mapping in the metropolitan area of Atlanta through our collaborative research experiences. The Atlanta Community Mapping and Research Center or ACMRC at Georgia State University seeks to cultivate a collaborative group committed to applying spatial thinking and geographic methods to community-based research initiatives in partnership with non-profit organizations, public agencies or local governments throughout metropolitan Atlanta. The ACMRC is dedicated to working with residents and other neighborhood level stakeholders in unique community-university partnerships to utilize spatial thinking and geographic methods (e.g. mapping, Geographic Information Systems or GIS, participatory action research, field data collection, focus groups, and interviews) to cooperatively address the needs and desires of community groups, neighborhood institutions, and residents. This poster showcases the unique nature of community-university partnerships across multiple disciplines and across diverse cultural and economic groups in major urban areas.

**Key words:** community mapping, community geography, Atlanta, GIS

## ADAPTIVE REAL ESTATE STRATEGIES TO FACILITATE NEIGHBORHOOD-ORIENTED RETAILING

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### Abstract

Many long-established high density urban neighborhoods throughout the United States are chronically underserved with neighborhood-oriented retail establishments, and supermarkets in particular. In urban areas the difficulty is typically associated with real estate-related challenges, including the inability to assemble sufficient land, competing higher yielding uses, lack of parking, and high property tax burden. In suburban and fringe areas underserved by supermarkets, lack of sufficient threshold population density is often the key contributor, but real estate taxes can also play a significant role.

A variety of strategies have been implemented by the private, public, and even non-profit sectors to surmount the challenges of bringing supermarket and other neighborhood-oriented retailing to underserved markets. We explore these challenges through case studies that provide specific examples in several metropolitan areas, including Atlanta, Chicago, Detroit, Los Angeles, and New York City. Examples of how excessive commercial property taxes can push a property into distress will be presented, as will examples of how targeted real estate tax abatements helped bring supermarkets to underserved urban neighborhoods. Another urban strategy we examine involves establishing the supermarket as a mostly self-sustaining nonprofit organization. An example from a suburban fringe location demonstrates how adding an ethnic element to the supermarket orientation expands draw beyond traditional neighborhood trade area boundaries, thereby increasing sales and the viability of the store.

Neighborhood-focused retail locations offer a unique set of challenges due to their proximity to households, which often removes them from main thoroughfares and makes them unsuitable as locations for many retailers. Additional insights on real estate dynamics of neighborhood-oriented locations are gleaned from an examination of the subsequent uses of Michigan stores that were formerly tenanted by the now defunct Farmer Jack supermarket chain.

**Key words:** supermarkets, real estate, underserved neighborhoods, retail, real estate tax

[Panelists: Tom Dwyer, BBCN Bank; Kevin Kiepert, Meijer, Inc.]

## SMALL TOWN CHANGE IN EAST TEXAS: AN ANALYSIS OF RETAIL GROWTH AND DECLINE

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### Abstract

In recent years, many small towns across America have seen declining levels of retail activity attributable to a variety of factors. These factors include – but are not exclusively limited to – changing population dynamics, relocation of employment opportunities, a general retail shift toward larger towns and cities, and the extension of large metropolitan regions further into their surrounding exurban zones. While decline is common for many small towns in the midst of this evolving situation, there are some small towns that have been able to maintain their vitality and even grow in population and employment.

The small town literature indicates that many towns that have maintained their retail vitality have done so by adapting in a variety of ways to a changing social and economic climate. Effective adaptation often includes recognizing and seizing the opportunity of “place-based” development opportunities, such as capitalizing upon the presence of major transportation routes or incorporating a natural asset into the retail landscape. For some small towns, opportunity comes from being able to attract new and innovative forms of retail, and being able to capitalize on further spin-off benefits.

This research highlights a selection of small towns across a 14 county area within east Texas that exhibit varying degrees of retail success, with a focus on rapidly-growing and declining small towns. The investigation includes a detailed evaluation of the retail climate in each town, including an examination of the location and composition of retail activity within each town. The aim of this research is to benefit both local governments and business owners by identifying strategies and conditions linked with small town retail success.

**Key words:** retail, development, geography, location intelligence

## SOCIOECONOMIC DISPARITIES, PHYSICAL ACTIVITY ENVIRONMENTS, AND CHILDHOOD OBESITY IN ALABAMA’S BLACK BELT REGION

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### Abstract

Childhood obesity disproportionately affects those from racial and ethnic minority groups as well as those from a lower socioeconomic status. The issue is particularly important in the Black Belt region of the rural South, a region characterized by severe poverty, low educational attainment, poor health care, and high obesity rates. This research aims to focus on an understudied population, rural Black Belt children, in order to illustrate obesity rates in relation

to children's socioeconomic status and the physical activity environment. 671 children from six elementary schools in two Black Belt counties will be analyzed against aspects of the built environment to more comprehensively understand obesity among children in the Black Belt region. This will be accomplished through the use of mixed methods, quantitative measurements acquired through GIS techniques and statistical analysis as well as qualitative measurements derived from surveys and spatial video recordings of the built environment.

**Key words:** childhood obesity, socioeconomic disparities, built environment, physical activity, Black Belt region

#### SPACE-TIME INTERACTION OF RESIDENTIAL BURGLARIES IN WUHAN, CHINA

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##### **Abstract**

Borrowing methods from epidemiology, studies of spatio-temporal regularities of crime have been booming in various industrialized countries. However, few such attempts are empirical studies using crime data in developing countries due to a lack of data availability. Utilizing a recent burglary dataset in Wuhan, the fourth largest city in China, current research applied the sequential kernel density estimation and the space-time  $K$ -function methods to analyze the spatio-temporal changes of hotspots of residential burglaries. The results show that, both spatial and spatio-temporal clustering exists. The hotspots were relatively stable over time. The space-time clustering, however, shows significant concentrations both in space and over time. In addition, analytic results show significant effects of distance decay in terms of occurrences of burglary incidents along the spatial and temporal dimensions. Moreover, findings from the research provide critical information on the space-time rhythm of crime, and therefore can be utilized in crime prevention practice. Finally, the implications of the findings and limitations are discussed.

**Key words:** burglaries; space-time point pattern analysis; space-time clustering; kernel density estimation

#### SPACE-TIME PATTERNS OF RESPIRATORY CANCERS INCIDENCE AND MORTALITY, KENTUCKY 1969-2011

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##### **Abstract**

Kentucky rates of lung cancer and related neoplasms are larger than those for the nation and surrounding states. Additionally, the eastern Appalachian region of Kentucky manifests the highest rates for diseases, including lung cancer and non-cancer-related respiratory diseases, such as chronic obstructive pulmonary disease (COPD). Previous research reveals a complex interplay of social, environmental, economic, health care, and educational factors driving the elevated rates. Temporal changes in spatial patterns of respiratory cancer incidence and mortality, however, have not been explored, despite their value in understanding the interplay of factors influencing these outcomes.

I explore spatiotemporal patterns of incidence and mortality related to respiratory neoplasms at the county-level across Kentucky from 1969 through 2011. I apply several cluster identification techniques, spatial regression, and geographically weighted regression (GWR) to examine historical shifts in the spatial patterns. I also compare the spatiotemporal patterns of incidence and mortality as well as with changes in smoking rates, given the importance of tobacco use as a risk factor for respiratory cancers.

The elevated rates of disease incidence and mortality manifest a long term trend of clustering in southeastern rural Kentucky along with stronger clustering of smoking rates. Respiratory neoplasm rates gradually increased from 1969 until 1990 and reached a stable plateau in the early 1990s. Processes driving the observed health outcomes are long-term and cause persistence of clusters of high incidence and mortality rates.

**Key words:** respiratory cancers, space-time analysis, disparities, medical geography

## SPATIAL ANALYSIS OF INFORMAL ECONOMY IN BEIJING: CASE STUDY OF STREET VENDORS

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### Abstract

Informal economy has been growing dramatically in cities around the world, both in developing and developed countries. They provide a very useful compliment to the formal economy in some cases. Studies of informal economy started five decades ago, and many aspects of the informal economy have been analyzed. However, there is very limited existing research regarding the spatial distribution of the informal economy in urban areas, especially in developing countries. This is mostly due to data and resource availability. The spatial distribution of the informal economy is important for us to understand, because it provides insights into how and why certain informal economy existing in certain areas. Better understanding can help cities to manage the informal economy in a more meaningful way.

This paper tries to fill in the gap in past studies, and explores the spatial distribution of informal street vendors with a case study in Beijing, China. Beijing is selected because it is one of the fastest growing cities in China and its informal economy has been booming since 1980s. Detailed GIS data are collected in the city, and vendors are divided into nine different categories. Our spatial statistical analysis demonstrates that spatial distribution of street vendors has very unique patterns depending on the types of vendors. It also tends to have stronger congregation among certain major streets, but much more dispersed at small neighborhood level.

We will present the spatial models to analyze the spatial distribution of informal economy in Beijing, and help develop better urban policy recommendations regarding street vendors in Beijing.

**Key Words:** Spatial analysis, Informal Economy

## SPATIAL AND TEMPORAL ANALYSIS OF PRECIPITATION SEASONALITY FOR THE SOUTHERN UNITED STATES

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## Abstract

Though climate change may alter the overall magnitude of precipitation on an annual basis, it may also influence the distribution of the precipitation throughout the year. Changes to the seasonality of precipitation can have profound impacts on water availability, agricultural productivity, and other biological cycles. In this paper, the spatial and temporal characteristics of the seasonal distribution of precipitation for climate divisions (CDs) across the southern United States (Arkansas, Louisiana, Oklahoma, Texas) are examined for the period of 1895-2013 using both raw data and a derived vector quantity based on the approach developed by Markham (1970). Precipitation is treated as a vector, where mean monthly rainfall totals for a climate division are vector quantities with the magnitude of the vector being precipitation total and direction as the month. Combined with annual precipitation total, the resultant vector can be used to produce a Seasonal Index, indicative of the degree of seasonality for the climate division. The magnitude of the vectors for the CDs is highest in the eastern climate divisions. However, the Seasonality Index increases from east-to-west. The orientation of the vectors suggests the region has a late-winter, early-spring precipitation maximum. Considerable inter-annual variability exists among the precipitation vectors for any given climate division.

**Key Words:** precipitation seasonality, southern US, vector orientation and magnitude

## SPATIAL RELATIONSHIP AND COLOCATION OF CRIMES IN JEFFERSON COUNTY, KENTUCKY

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## Abstract

Crime is a major social issue in American cities. Understanding the spatial pattern of crimes is imperative for developing informed policy and effective policing strategy that will reduce crime in local communities. This paper examined the spatial distribution of major crimes in Jefferson County, Kentucky. Using crime data spanning over the period between 2009 and 2011, this study looked into the spatial relationships and colocation patterns among different types of crime across the county. Specifically we tried to uncover which crime types tend to colocate with each other and where the colocations exist in the county. Over thirty types of crime (excluding sex crimes) were first reclassified into ten categories, and aggregated into each of the 575 census block groups. Principal component analysis (PCA) was used, at the census block group level, to extract components from reclassified crime data to identify the categories of crime which are heavily loaded together and therefore share similar location patterns. Four components were extracted and named contraband, violent, property, and theft, respectively. Component scores for each component were mapped and analyzed for census block groups, which helps reveal spatial colocation patterns of crimes in Jefferson County. Temporal changing in crime colocation patterns from 2009 to 2011 was also examined in this study.

**Key words:** spatial relationship, colocation, crimes, principal component analysis

## MEXICO'S DRUG NETWORKS: A SIMULATION OF SMUGGLING ROUTES TOWARD THE UNITED STATES

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### Abstract

Drug smuggling routes are chosen to maximize profit while minimizing costs. Specifically, routes that cost the least in terms of distance and present the lowest risk of drug loss due to police confiscation and smuggling gang turf battles are most-preferred. This study attempts to predict the ground trafficking corridors for marijuana and opium derivatives from Mexico's drug production regions to the ports of entry along the U.S. border. The least expensive drug smuggling routes are estimated using network analysis as the least-cost paths. The cost surface, representing impedance to transport illicit drugs, are modeled by considering physical, socio-demographic, and drug violence factors. The impedance across the cost surface is then transferred to the corresponding roads to represent the cost for moving drugs along the road network, which is further used as input for network analysis. The results show that the current divisions of territories among the drug organizations and their drug trafficking routes have a geographic component. The smuggling corridors were developed in the areas that grant the traffickers access to the least-cost routes without passing through hostile territories controlled by other gangs. The findings help better understand and predict the dynamics of drug smuggling routes.

**Key words:** drug trafficking, drug routes, road network, simulation

### Siting Carbon Conversion Energy Facilities with Spatial Multi-Criteria Analysis

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### Abstract

Wyoming is known for its abundance of fossil fuels, and has a significant infrastructure to support the production of these traditional energy resources. With increased demand for more diverse energy sources, a need has emerged to pursue new, innovative energy development approaches. This paper describes the application of spatial multi-criteria analysis to explore potential for carbon conversion energy facilities in Wyoming. Spatial multi-criteria analysis is an important capability of GIS, applying multiple criteria evaluation to place-based problems such as facilities siting. Two cases are presented concerning synthetic gas production - the siting of a small-scale coal gasification facility to support a public-private research partnership, and development of a statewide suitability model for commercialization of high temperature gas-cooled nuclear reactor technology. Results demonstrate that success and challenges with multi-criteria techniques are influenced by availability of quality geospatial data, accessibility of computational processing resources, and committed engagement and utilization of domain experts.

**Key words:** geographic information systems, multi-criteria evaluation, site suitability, energy resources, Wyoming

## SPATIOTEMPORAL ANALYSIS OF CLIMATE VARIABILITY IMPACT ON MALARIA PREVALENCE IN GHANA

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### Abstract

Contemporary research has focused primarily on the impact of temperature and rainfall on malaria prevalence with conflicting results. To obtain a better understanding of climate variability and the impact on malaria prevalence, the study examined the varying spatial and seasonal distribution in malaria prevalence over time in Ghana.

We used trajectory and time series analyses for temporal distribution and conducted GIS-based analyses of the spatial distribution of yearly malaria incidence and climate variables. We observed that the national annual malaria incidence has increased. Considerable inter-annual variations were also detected in the intensity of malaria incidence across regions characterized with varying rainfall and temperature. We noticed a decrease in 30-year regional rainfall and increase in 30-year regional average temperature.

The results suggested that rainfall periods contributed to high malaria prevalence with peak months from May to September critical for intervention programs.

**Key words:** spatiotemporal, climate variability, malaria prevalence

## STATISTICAL DOWNSCALING OF MODIS DERIVED LAND SURFACE TEMPERATURES FOR METROPOLITAN JEFFERSON COUNTY, KENTUCKY

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### Abstract

This project examines the feasibility of the statistical downscaling approach for increasing the effective spatial resolution of MODIS derived mean surface temperatures based on globally modeled relationships with Landsat TM data. The TM data is used to derive various spectral indices and is subjected to principal component analysis to potentially yield new information not apparent in the original TM data. In total, 36 covariates are modeled against the distribution of MODIS surface temperatures, 9 of which are significant and combine to produce an overall coefficient of determination ( $R^2$ ) equal to approximately 80% of the total variation of the MODIS data. Downscaling output is subjected to accuracy assessment using TM thermal data and results indicate the procedure is able to predict the downscaled MODIS data to within a root mean squared error (RMSE) of 4.1 degrees relative to the TM thermal data.

**Key words:** Remote sensing, GIS, urban microclimate, model downscaling

## STRIKING A MATCH: NEIGHBORHOOD CHARACTERISTICS AND INCIDENCE OF FIRES

## Abstract

Throughout the United States, cities continue to struggle with the age-old problem of neighborhood fires and other types of emergencies. Such incidents are known to be geographically clustered, yet few models, or the agencies that use them, take spatial effects into account when making decisions about predicting demand or the spatial allocation of public resources. Because these emergencies not only correlate with neighborhood characteristics, but also produce fiscal spillover effects, we address the following questions: What neighborhood characteristics are associated with demand for emergency services? To what extent are they spatially clustered, producing negative spillover effects? How might they relate to neighborhood social welfare functions? We draw on theories of social disorganization and fiscal spillover to develop a spatially explicit model of the demand for fire department service delivery in Charlotte, North Carolina. We conclude that policies to improve neighborhood social ties and efforts to promote economic well-being can reduce the incidence of fires and other emergency calls for service, thereby reducing demand for these local government services.

## STRUCTURE, COMPOSITION AND CHARACTERISTICS OF WINDBREAKS: A CASE STUDY FROM KANSAS

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## Abstract

We conducted a field survey in Northwestern Kansas to assess the structure, composition and characteristics of the windbreaks in the region. We visited 181 windbreaks in the field covering about 309 acres (125 hectares) from seven different counties. The survey data suggested that 69% of the windbreaks were in good condition, 21% in fair condition and 10% were in poor condition. Field windbreaks covered about 45% of the surveyed windbreaks. Farmstead windbreaks were about 37 percent and the remaining 18% served for livestock.

Among the studied windbreaks, 53% consisted of single species and remaining 47% were multi species windbreaks. Twenty different species of trees were documented during the survey. Cedar (*Juniperus sps*) was the most common tree species. It was reported from 75% of the surveyed windbreaks. The other common tree species were Cottonwood (*Populus sp.*), Siberian elm (*Ulmus pumila*), Honey locust (*Celtis sps*), and Oak (*Quercus sps*). We recorded invasive species from only one windbreak.

**Key words:** windbreaks, structure, composition, species, field survey

## TAKING ADVANTAGE OF THE IMPROVED AVAILABILITY OF CENSUS DATA: A FIRST LOOK AT THE GRIDDED POPULATION OF THE WORLD, VERSION 4 (GPWv4)

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### **Abstract**

Global gridded population data are increasingly being applied to a broad range of fields. This paper presents improvements made in the fourth version of the Gridded Population of the World (GPWv4) data set. GPWv4 is a minimally-modelled data set that uses uniform distribution to disaggregate census data from their native input units into a 30 arc-second global grid. Due to an increase in freely accessible census data from the 2010 round of censuses, 87 countries are gridded at a higher administrative level than in the previous version, with a more than five-fold increase in the total number of census units outside of the United States. The resultant decrease in unit size has greatly improved the data set accuracy. Additionally, version 4 has expanded to include grids of age, sex, and urban/rural status. Obtaining high-resolution census data and matching census geography remains a priority for improving global gridded population data sets.

**Key words:** gridded population, census geography, GPWv4, uniform distribution

### TEMPORAL AND SPATIAL VARIATION IN PRECIPITATION SEASONALITY FOR KANSAS

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### **Abstract**

A considerable amount of research work on climate change is being done to examine what has happened in the recorded past and what might happen throughout the remainder of the 21<sup>st</sup> Century. While the data for trends in the temperature record tend to be more straight-forward, what has and will happen with precipitation is less clear. Research by others suggests that extreme daily precipitation amounts are trending upward, while some places get wetter and others get drier. This research addresses a little studied aspect of global climate change precipitation delivery: seasonality. Using data for the nine Climate Divisions within Kansas for the period from 1895-2013, the results from this analysis indicate that there has been a tendency recently for the spring months of March, April, and May to have a greater share of the annual total. Geographic variation across the state indicates a west-to-east gradient with a greater increase in spring precipitation in eastern KS.

**Key Words:** precipitation seasons, Kansas, spatial variation

### THE GEOGRAPHICAL CONCENTRATION OF WEALTH AND POVERTY: A COMPARISON STUDY OF EDWARDSVILLE-GLEN CARBON AND EAST ST. LOUIS, ILLINOIS

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### **Abstract**

This paper investigates the concentration of wealth and poverty in Edwardsville-Glen Carbon versus East St. Louis, two cities in Illinois located only 20 miles apart. While they are close geographically, the two communities display significantly disparate levels of concentration in banking resources, as well as widely divergent socioeconomic development indicators. The paper compares and contrasts the inter-community differences, and it also investigates the changing levels of differentiation over time from the 1990s to the present. The study explores the possible causes of the diverging pattern of development from historical, political, and socioeconomic points of view.

**Key Words:** poverty, wealth, concentration, East St. Louis, Edwardsville-Glen Carbon

## THE GEOGRAPHY OF GOLF COURSE IN THE U.S. AND WATER DEFICIT CAUSED BY GOLF COURSE WATER CONSUMPTION

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### Abstract

There are more than 35,000 golf courses worldwide and 50% or more are in the U.S. Pesticide use and water consumption are major environmental concerns on golf courses. Although there are ballpark estimations based on surveys or irrigation water tracking programs, it is never clear how much water all golf courses are need in the U.S. and how they distribute geographically. With recent work on evapotranspiration (ET) and regional surveys from the golf industry, we set up a GIS framework to estimate golf course water consumptions using an approach of location-specific and precipitation and ET-based. The objectives of this research are: study the geography of golf course in the U.S., identify the deficit and surplus of water need in golf courses using precipitation and ET data, and prepare for future studies of GIS and golf course from the perspective of health and the environment.

**Key words:** golf course, water deficit, GIS.

## THE GREAT RECESSION AND DETERMINANTS OF MIGRATION TO AND FROM FLORIDA, 2008-09 AND 2004-05:

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### Abstract

Florida had a net loss of 18,000 migrants to other states between 2008 and 2009, while it had a net gain of 185,000 migrants between 2004 and 2005. This paper examines the determinants of state in, out, and net migration for the 67 counties in Florida before and after the Great Recession. Counties with a high percentage of the labor force in tourism and those with a military base experienced high rates of both in and outmigration for both years, probably more indicative of a mobile population than an expanding or contracting economy. Counties with high rates of unemployment experienced high outmigration in 2008 and 2009 suggesting that the economic recession affected those counties. Counties with a high percentage of elderly attracted migrants in both years, likely because elderly, while not directly in the labor force,

still require a cadre of support workers. Surprisingly, change in median housing value was not significant for 2008 and 2009.

**Key Words:** Great Recession, Internal Migration, Florida

## THE IMPORTANCE OF WOOD CHANNEL STRUCTURES IN STREAM ECOLOGY AND MANAGEMENT

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### Abstract

The role of in-channel wood has been historically underappreciated in stream management. Until the 20<sup>th</sup> Century, wood channel structures were often completely removed from rivers. Scientific research since the 1970s has illustrated that the removal of in-channel wood reduces stream channel heterogeneity, which in turn induces lower biodiversity, lower stream organic material and biomass, and reduced sedimentation. Forest and water resource managers need to understand the importance of wood entry and storage in streams. In this paper, we synthesize the impacts of three wood channel structures: beaver dams, log steps, and wood jams, and illustrate the management significance and implications of these wood channel structures. The information in this paper can assist resource and forest managers in decision-making on wood in managed stream reaches.

## THE NORTH AMERICAN FREE TRADE AGREEMENT (NAFTA) AT 20: AN ASSESSMENT FROM A GEOGRAPHICAL PERSPECTIVE

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### Abstract

On January 1, 1994, The North American Free Trade Agreement (NAFTA) united the economies of Canada, the United States, and Mexico, creating what has become a \$19 trillion regional market with around 470 million consumers by today's standards. The distinction of NAFTA from other international pacts and trade agreements centers on its uniqueness as the first comprehensive free-trade agreement, joining the economies of two developed nations to a developing one, ultimately, achieving broader and deeper market inroads than any other international trade agreement before. However, over the past two decades, NAFTA has been equally lauded and criticized. This research performs a qualitative analysis of objective formal reports and publications, as well as, informal writings in order to produce a work that reviews the strengths and weaknesses of NAFTA at 20 with a strong emphasis on the geographical implications of the free trade agreement, such as NAFTA's impact on the U.S.'s border regions with Mexico and Canada. The paper concludes with an analysis of the future of NAFTA in light of new trade negotiations with the Trans-Pacific Partnership, as well as, the Transatlantic Trade and Investment Partnership.

**Key Words:** North American Free Trade Agreement, NAFTA, free trade, economic integration, international trade agreements

## THE PALEOHURRICANE RECORD FROM THE GEORGIA COAST

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### Abstract

In this paper I present the results of a paleohurricane record from Wassaw Island and St. Catherines Island, Georgia, on the US Atlantic coast. The two islands are part of a large regional embayment known as the Georgia Bight that very infrequently gets impacted by severe hurricanes when compared to other locations on the US Atlantic coast. Although the Georgia coast has not experienced landfall of a major hurricane for more than one century it is still potentially subject to the severe effects of tropical cyclone activity including storm surge, wind damage and floods. The patterns of overwash deposits in the sedimentary record recovered from Wassaw Island and St. Catherines provide evidence of past changes in tropical cyclone activity on the Island over the past 3000 years. Preliminary findings based on analyses of Loss on Ignition (LOI), XRF (X-ray Fluorescence Spectroscopy) and foraminiferal data from Livingstone and vibra cores from salt marshes on the two Islands show evidence at least seven major storm events. The record shows apparent alternating activity regimes of active periods and a quiet period which suggests significant changes in hurricane climatology over the last the 3000 years.

## THE RELATIONSHIP BETWEEN THE MADDEN-JULIAN OSCILLATION AND TROPICAL CYCLONE TORNADO CLUSTERS

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### Abstract

Tropical cyclones (TCs) such as tropical depressions, tropical storms, hurricanes, and their extratropical remnant stages frequently produce tornadoes (TCTORs). These tornadoes are often in clusters and are responsible for considerable property damage and mortality. Recent work has centered on identifying the synoptic-scale features associated with these events.

This study is the first to attempt to link the synoptic-scale to the intraseasonal-scale by examining the impact of the Madden-Julian oscillation (MJO) on the occurrence of tropical cyclone tornado clusters. Results indicate a contributing but not controlling link between MJO phase and TCTOR occurrence. This work aligns with previous work done on TCs and tornadoes as individual events, but indicates additional research is needed on conditions during MJO phase transitions and the interaction with interannual climate variability on the production of TCTORs.

**Key words:** tropical cyclone tornadoes, Madden-Julian Oscillation, intraseasonal climate variability

## THE ROLE OF POINT SOURCE AEROSOL EMISSIONS ON ATMOSPHERIC CONVECTIVE ACTIVITY IN THE VICINITY OF POWER PLANTS IN GEORGIA, USA

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### **Abstract**

Although notable advances have been made regarding the influence of aerosols on precipitation processes, the ability of power plant aerosol emissions to alter cloud microphysics and enhance atmospheric convection is still not fully understood. By analyzing the relationship between proximity to coal power plants and lightning flash density in Georgia from 1992-2003, we find that lightning strike frequency is not substantially enhanced near power plants in the long-term warm season climatology. If existent, any signal was likely masked by the more dominant mechanisms of the sea breeze circulation, Sandhills-Fall Line convection, and Atlanta urban environment. Despite the lack of a definitive signal in the climatology, several cases of potential lightning amplification were identified for Plant Scherer. Therefore, lightning enhancement due to power plants appears to occur in isolated events, particularly when atmospheric instability and water vapor are not limiting factors, which still poses significant hazards to individuals in the vicinity.

**Key words:** lightning, aerosols, power plants, Georgia

### **THE SPATIAL DISTRIBUTION OF THE GENETIC TRAIT DISPERSAL PATTERNS OF THE FRIESIAN HORSE IN NORTH AMERICA**

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### **Abstract**

The very concept of selective breeding is taking into man's ability to modify a group of animals' genetic makeup to be shaped the way he sees fit, and not how nature may intend it. But when looking at many of these breeds there is usually a kennel club or some form of studbook, and then there are specific rules that are enforced to be part of these associations. Every association has a different set of traits that determine the characteristics of that given breed.

Using the rules of the Het Friesch Paarden Stamboek (KFPS) the studbook for the Friesian horse, we will look at the roughly 7000 Friesian horses in North America. The data has been provided by the Friesian Horse Association of North America (FHANA), containing the horses' registration, sire (father), and zip code. Also acquired from the association is the information on the 32 approved studbook stallions, the only ones allowed to breed, along with a numerical value for all 26 of physical traits/characteristics that each stallion possess. The limited number of stallions allowed to breed within the association keeps a specific racial type or breed type that is easy passes on these traits to the given offspring. Different stallions produce in different ways according to how the owner chooses and the given circumstances. Some of the older stallions are not capable of artificial insemination, making the requirement be live cover. Live cover limits the distance that a mare can be from a stallion and creates a smaller area that the stallion can influence. Those that can do artificial insemination use either the chilled or frozen methods. Not every stallion can produce frozen sperm, limiting the number of stallions who can reproduce this way, but does have an unlimited shelf life. But chilled semen is easier and cost less but only has a shelf life of 48 hours limiting the distance it can travel, but still further than live cover but not as far as frozen.

This study will assist in making a tool for analyzing the traits, by looking at the sire's traits' numerical values, and what areas each of these stallions' offspring cover, according to how they are used in the different methods of reproduction. This tool will assist in looking for an area to purchase a horse with a set of traits most desired for a breeding program, but also assist in looking at the trends in what direction an area is headed, trait wise, so that horses with other traits can be brought in to balance what might be lacking.

**Key words:** selective breeding, spatial analysis, cluster analysis, equine industry, trait dispersal

## **THE SPATIAL EXTENT AND COVERAGE OF TORNADO SIRENS IN SAN MARCOS, TEXAS**

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### **Abstract**

The tornado siren has become the standard method of notifying resident populations of dangerous weather conditions. In March, 2012, the city of San Marcos, Texas purchased 14 Tempest-121 rotating sirens creating a coverage network. Because San Marcos has experienced two tornadoes during the previous twelve years, two research questions were constructed, 1) what is the spatial coverage of the tornado siren network in San Marcos, and 2) what is the approximate number of residents located outside the siren's network coverage area? The hypothesis stated that the siren network left more than 10 percent of the population outside the coverage area.

Each tornado siren was individually located and associated GPS data allowed for construction of the siren network in a GIS. The analysis identified approximately 26 percent (8.46 mi<sup>2</sup>) of San Marcos located outside the network's coverage area. Furthermore, analysis of census block data and the extent of siren coverage resulted in 5.14 percent of residents not included in siren coverage, approximately half compared to what was hypothesized. As San Marcos continues to expand, both in size and in population, the question of whether there is enough coverage for the entire city for the foreseeable future remains unclear.

**Key words:** tornado siren, siren network, coverage extent **THE STUDY**

## **OF URBAN HEAT ISLANDS IN AUBURN-OPELIKA, AL USING REMOTE SENSING AND OBSERVATIONAL TECHNIQUES**

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### **Abstract**

Urbanization is defined by the EPA as the concentration of human populations into discrete areas, leading to transformation of land for **residential, commercial, and industrial purposes**. Conversion of pervious surfaces to impervious surfaces poses a number of environmental consequences, including higher temperatures, increased surface runoff, and intensification of

urban heat islands. Urban heat islands (UHI) are created by large cities because buildings, impervious surfaces, energy and transportation use, and reduced evapotranspiration, increase urban temperatures compared to their rural surroundings. UHIs can also exacerbate the effects of severe weather events including thunderstorms and heat waves, posing potentially fatal health risks. This month long pilot study (part of a more long term, comprehensive study) uses observational data from a widespread network of high frequency temperature monitoring instruments and the Landsat 8 TIRS band (band 10) to satisfy the following research objectives: 1.) quantify the magnitude and intensity of the surface or *skin* UHI through Landsat 8 imagery in the Auburn-Opelika, AL urban area 2.) quantify the magnitude and intensity of the atmospheric UHI through a widespread network of high frequency temperature monitoring instruments in Auburn-Opelika and 3.) compare the atmospheric and surface UHI effects in Auburn-Opelika. DNs from the TIRS band are converted to land surface temperature values in order to quantify urban and rural temperatures. Results showed a significant UHI effect over the study area, highlighting the effects of urban surfaces on temperature in the downtown areas. In addition, surface temperatures were found to be hotter than atmospheric temperatures in the urban areas, while atmospheric temperatures were found to be hotter than the surface temperatures in the rural areas. This research is significant in the wake of the likelihood of extreme climatic events such as heat and cold waves, and increased global temperatures. It will also contribute to the limited literature on UHIs in Alabama urban areas.

**Key Words:** UHI, urbanization, Landsat 8, Auburn, Opelika, Alabama.

### Third Sector Organizations, Population Dynamics, and Changing Vulnerabilities Following the 2011 Earthquake in Christchurch, New Zealand

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### Abstract

Communities and individuals rely on Third Sector Organizations (TSOs) following natural disasters to complement formal government recovery activities by providing targeted support. In this way, TSOs can fulfill important niche roles, but the picture becomes complicated if residents and organizations relocate and connectivity is lost. Recovery may be compromised especially for vulnerable and marginalized individuals if communities are displaced from the service provision area of the TSOs that are most sensitive to their needs. This study focuses on TSOs in Christchurch, New Zealand, where an earthquake in February 2011 devastated parts of the city, precipitating a migration of residents from northeast neighborhoods to suburbs in the west and southwest of the central business district. Traditional social vulnerability metrics, derived from the 2006 and 2013 New Zealand censuses, show shifting ethnic, livelihood, and household structure related vulnerabilities throughout the city and comparisons of ward and area unit level un-weighted and weighted suitability indices illustrate how relocation has impacted TSO proximity for marginalized groups. Ethnic and emergent marginalized groups in particular struggle to maintain interpersonal networks post-disaster due to cultural norms and resource access, which is particularly concerning given income disparities, increasing rents, and emotional trauma across the region. Impacts of livelihood marginalization are also evident for emergent groups of immigrant construction workers, whose ability to acclimate is contingent

on accessing information on social services. Although the city has proven to have a resilient economy and public awareness of TSO involvement in areas of population influx has increased, understanding population dynamics is imperative to informed recovery planning.

## UNCOVERING SPATIO-TEMPORAL PATTERNS OF STREET ROBBERY IN DP PENINSULA, SOUTHERN CHINA

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### Abstract

The paper aims to uncover macro and micro spatial-temporal patterns of street robberies on DP Island of H city in southern China. DP Island, with an area of about 4 square kilometers, connects to the city via 7 bridges. There are a total of 373 street robbery incidences during the period of 2006-2011. Since street numbers are not linearly calibrated along streets in China, each incidence has to be geo-coded manually to a street network. First, all street robbery incidences are summarized by year (6 years), month (12 months) and hour (24 hours). The summary shows that street robberies reached a peak in 2007, followed by a trend of steady decrease until 2010; Just before the Spring Festival (around February), the number of incidences is much higher than that of other months. This pattern is different from those found in other countries, including the United States of America; during a day, street robberies peak during 22:00-23:00. Second, crime hotspots are revealed by kernel density mapping of all street robbery incidences. Comparisons with street network and land use suggest that hotspots tend to associate with main throughputs, intersections with high accessibilities, and areas with a high degree of land use mixture. To better characterize detailed patterns needed by policing, this paper selects 4 hotspots with the highest density for further analysis at a micro level. Prediction accuracy index (PAI) shows that these 4 spots are "hot" during all the 6 years from 2006 to 2011 and therefore warrant special attention for crime reduction and prevention. These hotspots are placed in different categories of the "hotspot matrix", which combines the spatial distribution (clustered or not) within the hotspot and the temporal distribution (clustered or not) in 24 hours. Based on these spatio-temporal patterns, the study suggests possible means for more effective policing, policing resource allocation, and crime prevention strategies. The study represents the first case study of its kind in China, and it sets the stage for future comparisons with other Chinese cities and foreign cities. Unfortunately, the name of the city cannot be revealed per confidential agreement on the crime data.

**Key words:** DP peninsula; street robbery; kernel density; PAI index; hotspot matrix

## URBAN IMMERSION: USING FILMS TO TEACH URBAN SOCIAL GEOGRAPHY

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### Abstract

To borrow from Lewis Mumford, the city is a geographic plexus, a theater of social action: *the city creates theater and is the theater*. T. S. Eliot urges us to *go and make our visit* to cities, to these places of intense excitement, great mystery, and human diversity. How can we as geography educators immerse the student in this drama and excitement? Lectures and readings can have a limited impact with today's media-savvy student. However, pairing film imagery with selected readings and scholarly analysis of cities can be uniquely impactful. Movies entertain, but they also provide insight and emotional connection into the urban drama. Cinema represents distinctive spaces, lifestyles, and urban conditions and can capture the spatial complexity, diversity, and social dynamism of the city. Using cinema as a pedagogical tool immerses students in the urban experience more than traditional instructional methods, resulting in a richer understanding of the subject.

In this paper I review my experience in creating and teaching an urban social geography course using full-length, feature films. I discuss specific films and readings, and how they relate to different urban issues. The goal in film selection was to use cinematic visions beyond what we experience in our everyday lives and to look beyond how film represents a place to how it comments on urban conditions. Pairing a movie with a reading seemed to have a synergistic effect on class discussions. Over the course of the semester I found that, as cultural texts, movies are extraordinarily rich and had a powerful influence on how students constructed their sense of the urban world and its social, cultural, and spatial landscapes.

**Key words:** cinema, films, urban social geography, pedagogy

## URBAN SPRAWL AND THE LOSS OF PERI-URBAN LAND: CASE STUDY OF NAKHON RATCHASIMA PROVINCE, THAILAND

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### Abstract

Research has indicated that Thailand's future economic growth and industrial expansion will be relocated to peri-urban locations and secondary cities throughout the Kingdom. As industrial activities extend into and transform rural areas, incompatible land use patterns emerge and produce pressures on environmental resources. This research investigates the dynamic of peri-urban growth in Sung Noen District, Nakhon Ratchasima Province in Thailand. The study area represents a new growth secondary city with one of the largest metropolitan populations for a city disconnected from Bangkok's extended metropolitan region. Our study aims to provide a systematic analysis of peri-urban change in this area. We utilize a hybrid classification scheme to examine multi-temporal Landsat TM and Landsat ETM+ data, coupled with GIS analyses to help assess the loss of peri-urban land between 1990 and 2014. The result can serve as a guide to answer future research questions relating to sustainability and environmentalism within urbanization and national development.

**Keyword:** Peri-urban change, urban growth, hybrid classification, Thailand

## USE OF LANDSAT DATA TO ESTIMATE LAND USE CHANGES IN RURAL SOUTHWESTERN BANGLADESH

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### **Abstract**

Bangladesh is a low lying, deltaic nation, and is one of the world's most densely populated and impoverished countries. Bangladesh is a primarily rural and agricultural, and rice cultivation plays a pivotal role in its economy. Recent conversion of rice fields into ponds for shrimp aquaculture has caused a significant change in the land use/land cover pattern in coastal areas, and has been the focus of controversy over its negative impacts on the local environment and economy. Remote sensing data have been used for decades as a cost-effective tool for evaluating vegetation and associated land use and land cover changes at large scale. Vegetative indices, such as the normalized difference vegetation index (NDVI), are derived from remote sensing images to indicate the relative abundance and health (photosynthetic activity) of green vegetation. Landsat imagery from 1988 to the present was evaluated and NDVI values were calculated. The results of the NDVI analysis, ground-truthing, and an assessment of NDVI as a tool for measuring land use change in the study area, with emphasis on the transition from rice to shrimp, will be presented.

**Key Words:** Landsat, NDVI, Bangladesh

### **USING ANALOGUES TO SIMULATE CHANGES IN ALBERTA CLIPPER TRAJECTORIES WITH GLOBAL CLIMATE CHANGE**

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### **Abstract**

Alberta Clippers are extratropical cyclones that form in Alberta, Canada and move east-southeastward over the Great Plains and Midwest regions. With the onset of global climate change and the potential shifts in atmospheric circulation patterns, however, this defined storm trajectory could be modified. Since the affected regions support much of the national population and agricultural activity, the presence of the Alberta Clipper storm track influences regional climatological patterns.

In this study, atmospheric analogues defined by global temperature and El Niño-Southern Oscillation (ENSO) characteristics are used to compare the trajectories of past Alberta Clipper storms to hypothesize how these could change with global warming. The results indicate that, although the trajectory azimuths from  $t=0$  to  $t=60$  are similar between the analogues, starting latitude and longitude results show that, on average, Warm analogue storms form further to the north and east than La Niña analogue Clippers.

### **USING CLICKER TO ASSESS STUDENTS' SPATIAL LEARNING**

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### **Abstract**

Assessing student learning outcome is now becoming an important and unavoidable part of college teaching. Because of its subjective nature, how to make accurate assessment has always been an issue. In this study, clicker, also known as personal response systems, is used in a college introductory geography course to assess students' spatial learning outcome. Clicker is the devices allow instructors to get an instant feedback on what students understand. Using properly, it injects some active engagement into the normally passive lecture-hall environment. One of the advantages of using clicker is its ability to show the results moments after students answered the questions. This instant feedback is a powerful way to allow an instructor to assess student learning.

Since clicker can be used in classroom on a daily basis, it enhances instructor-student interaction and promotes students' active learning. It also makes learning assessment more effective.

**Key words:** assessment, clicker technology, spatial learning

## USING CRITICAL GIS TO MAP THE LIVED EXPERIENCES OF ATLANTA URBAN FARMERS AND GROWERS

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### Abstract

Individuals that engage in urban gardening and urban farming experience a multitude of emotions, opportunities, and challenges as they work to develop their spaces, sell what is grown in their spaces, and navigate through the complex urban landscape. These experiences are at the core of urban food accessibility and security issues, yet often these stories are marginalized in comparison to larger policy discussions or debates about whether or not an area is a food desert. Using critical GIS, community geography, and mixed methods, we work with a collaborative group of local growers and farmers in Atlanta to document and spatially represent the lived, everyday experiences of individuals as they engage in their everyday practices and traverse urban space. Our work places an explicit focus on spatially representing the hidden everyday geographies and emotional landscapes of urban agriculture. The work also extends conventional GIS and mapping analysis toward a more critical GIS analysis by focusing on qualitative data and local knowledge.

**Key words:** Atlanta, critical GIS, food accessibility, qualitative GIS, urban agriculture

## USING REMOTE SENSING AND GIS TO STUDY URBAN, SUBURBAN AND LAND-COVER CHANGE IN ALACHUA COUNTY, FLORIDA FROM 1993 TO 2003.

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## Abstract

Determining the best classification method to classify satellite images for the study area was the second objective of **THIS** research. Different classification methods were used in the research in order to improve the classification accuracy. Supervised classification was first approach to classify three Landsat images. The accuracy assessment of this classification was not acceptable for remote sensing research. Knowledge based classification was used to improve the accuracy in all images. The accuracy increased in all images, however there was misclassification in suburban class due to the mixed texture of this area. Third classification was performed after removing suburban class, the results were acceptable. This research found that 4.97% of the total area transformed from vegetation to built areas by 2003, 1.07% of the total area transformed from vegetation land cover to built area by 1998, and 2.23 % of the total area have converted from built structure to vegetation area in 1998.

## VISUALIZING AND ANALYZING COMMUNITY-BASED AIR QUALITY SAMPLING RESULTS USING GEOSPATIAL TECHNOLOGY AND ONLINE TOXICS RELEASE INVENTORY (TRI) DATA

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## Abstract

The primary objective of this project is to develop a methodology for communities on how to collect and map Bucket Brigade air sampling data, and then compare those results to releases displayed at various online sites such as TRI.NET, the U.S. EPA EJ Viewer, and the National Institutes of Health (NIH) TOXMAP Tool.

The primary population is environmental justice stakeholders in the Cayce Homes community, which is Nashville's largest public housing complex with over 2000 residents. Because the community is potentially affected by multiple releasers, has significantly high childhood asthma rates, and there are no government maintained air monitoring sites within at least two miles, it is a good location for Bucket Brigade air sampling .

The Martha O'Bryan Center and Health Impacts of Degraded Environments (HIDE), Inc., are working cooperatively with Tennessee State University (TSU) and Meharry Medical College to fabricate Bucket Brigade air sampling units. The collaborators are organizing hands-on, Bucket Brigade training workshops with Cayce Homes stakeholders. Bucket Brigade air sampling is being conducted at the Cayce Homes community. Air sample sites locations are being mapped using global positioning systems (GPS) units and geographic information systems (GIS) software provided by TSU. Stakeholders' air samples maps are compared with the locations of air pollution releasers, noting instances where samples collected match pollution sources. After analyzing the maps, Martha O'Bryan Center staff and stakeholders will discuss strategies for taking action, if necessary.

Stakeholders are contributing commentary on all aspects of the project. Their input is ensuring that community stakeholders' viewpoints are respected and fully included in the sampling design and methodology.

**Key Words:** Geographic Information Systems, Vulnerable Populations, Air Pollution, Public Health, Community Based Participatory Mapping

## VISUALIZING LAND USE CHANGES BASED ON HISTORIC IMAGES OF BREVARD COUNTY, FLORIDA

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### **Abstract**

There are thousands of publicly available historic aerial photos that allow people to readily visualize land use change over the years. However, consolidating the photos and developing a web application that will demonstrate land use change can be quite time consuming and potentially expensive. My research focused on analyzing time and cost effective methods for Brevard County to georeference, mosaic and serve out to the public over 3,000 historic aerial photos accumulated during a 70 year time period. Providing a means for users to easily compare photos for a land area over the years is an effective tool to illustrate the changes in our community. An analysis of the conversion from undeveloped to developed land in a 6 square mile study area was performed and will be reviewed.

The presentation also includes an examination of the user manual that was created for county volunteers to continue with the project.

**Key Words:** land change analysis, historic aerial photos

## VISUALIZING ROMAN HISTORY: COIN HOARDS ON THE FRONTIER OF BRITAIN

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### **Abstract**

Spatial analysis of cultural and economic material may be the best means of examining past landscapes and eras where no substantial written record exists. This may also identify cultural diffusion in frontier regions. A multidisciplinary approach incorporates archaeological and historical material and context that are analyzed through the construction of a GIS and spatial analysis.

Roman coin hoards are useful artifacts to examine the diffusion of Roman culture. RCH are dated using the closing date of individual hoards and assigned a relative value based on hoard composition and/or weight. Additionally, the locations of hoards are used to analyze the importance of past trade/transportation networks and barriers/boundaries that mark the extent of empire and/or culture.

The poster uses maps to show coin hoards in the frontier zone of Hadrian's Wall. The maps will also show the relationships of RCH attribute data to the landscape and trade networks of the frontier. The maps are representative of a GIS being developed for further analysis of the cultural landscape in the frontier zone of Roman Britain.

**Key Words:** Britain, Border, Culture, Economic, Empire, Frontier, Historical, History, Network, Roman

## WATER QUALITY ESTIMATION USING COMBINED WATER CHEMISTRY, FIELD SPECTROSCOPY IN THE SHENANDOAH RIVER, VIRGINIA

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### Abstract

Hyperspectral remote sensing data was successfully used to estimate spatial variation of optical water quality parameters such as chlorophyll a, turbidity and Total phosphorous of the Shenandoah River, Virginia. A multiband quassi-analytical algorithm using analytical model and matrix inversion method as well as BOMBER: A tool for estimating water quality and bottom properties from remote sensing images were used to retrieve inherent optical properties of the river for phytoplankton pigment, colored dissolved organic matter and Total phosphorus (TP). Inherent optical properties of the river resulted to a total absorption at the 555 nm wavelength of  $0.329 \text{ m}^{-1}$  and backscattering  $-1.207 \text{ m}^{-1}$ . Average absorption coefficients varied from  $0.23\text{-}0.33 \text{ m}^{-1}$ , absorption coefficient of phytoplankton pigments,  $-0.57 - 0.26 \text{ m}^{-1}$  and backscattering varied from  $-1.6$  to  $-0.97 \text{ m}^{-1}$ .

Estimates at 440 nm wavelengths showed chlorophyll a estimate of  $0.2206 \text{ m}^{-1}$ , CDOM concentration of  $0.58 \text{ m}^{-1}$ . The resultant concentration was then linked to Hyperion reflectance spectra for the sampling stations to develop predictive models to determine sensitive spectral variables for TP, Chl-a, and CDOM. The result indicates that TP has close association with diagnostic spectral variables with  $R^2$  ranging from 0.53 to 0.77. Water quality parameters show that our data had sufficient sensitivity to detect optical water quality concentrations, chlorophyll a, colored dissolved organic matter, and total phosphorous with high coefficients of determination.

**Key words:** Imaging spectroscopy, Hyperion, hyperspectral remote sensing, inherent optical properties, Shenandoah River, water quality, phytoplankton pigment, gelbstoff, detritus and Total phosphorus.

## WE KNOW WHERE YOU ARE—IN PLACE: ENRICH THE GEOGRAPHICAL CONTEXT OF SOCIAL MEDIA

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### Abstract

Space and Place are two fundamental concepts in geography with space normally considered as a “top-down” perspective and place as a “bottom-up” one. Last 10 years social media is becoming increasingly popular and the widespread adoption of GPS-enabled tagging of social media content provides a new window for us to study spatio-temporal activities of human beings. Until recently, the convergence of social media and GIS and relevant applications in GIScience mainly focuses on pinpointing where everybody and everything are located on the surface of the Earth — from a space perspective. However, we’re also eager to understand the individual activity from social media data at its locale level— from a place perspective. This

paper attempts to enrich the geographical context of social media by exploring the social media checkins from Foursquares. Exploratory spatial data analysis and point of interesting matching will be utilize to investigate the spatial and platial characteristic of social media data respectively. This study has a great potential to better understand individual behavior within urban environment as well as consolidate the concept of place in GIScience research in the future.

**Key Word:** Social Media, Checkins, Urban Environment, Space and Place

## WEAK FOUNDATIONS: THE FAILURE OF EQUILIBRIUM-BASED POPULATION GROWTH FORECASTS

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### Abstract

The traditional paradigm used to project population growth is the expectation that people follow jobs. The recession of 2008 made plain that a significant number of US metros experienced high levels of population growth despite persistently high unemployment. Equilibrium-based growth models assume that employment to population ratios should remain constant over space. Data on metro-scale population and employment from 1969 to present shows that; 1) there are significant spatial variations in the rate of change of population and employment ratios; 2) metro areas either outperform US averages or underperform – suggesting that employment-population equilibriums are independent of the growth process; 3) analysis of errors in a time-series of regression models of employment and population growth rates suggests that momentum and narrative may be more critical to explaining population growth than the availability of employment. Our data is consistent in showing that neoclassical expectations consistently fail to effectively predict population growth in sub-10 year periods. These findings have significant implications for the foundation of planning, policy-making and business location decision-making.

**Key words:** growth modeling, population change, retail location

## WINTER PRECIPITATION IMPACTS ON AUTOMOBILE ACCIDENTS IN THE UNITED STATES

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### Abstract

While an extreme event such as a tornado is dramatic and is frequently sensationalized through popular media, a traffic accident is a type of "chronic hazard" - a frequent danger of everyday living whose risks become accepted. This study seeks to determine if the presence of winter precipitation makes drivers more vulnerable to accidents, injuries, or fatalities as compared to dry roads, and how that vulnerability changes across the United States by calculating the relative risk of driving during winter precipitation.

Several cities in the United States with varying winter precipitation climatology were selected for analysis based on availability of meteorological and vehicle accident data. A matched pair research design was used to pair time periods with winter precipitation to time periods where inclement weather was absent. The relative risk (odds ratio) of automobile crash, injury, or death was calculated for each circumstance and city by creating a ratio between the number of collisions during precipitation and control periods. Examination of the relative risk of driving during winter precipitation in multiple cities enables the comparison of this risk between areas that are experienced with winter precipitation and those that are not. In addition, this study investigates winter precipitation thresholds in terms of precipitation type, amount, duration, and intensity that put drivers at additional risk within each city and examines how the thresholds vary across the United States. Finally, the study considers societal vulnerability as an explanation for variance in risk ratios. Results of this work can be used to improve the forecasting of travel impacts and reduce traffic accidents, injuries, and fatalities due to winter weather.

**Key words:** winter weather, traffic accidents, relative risk, public health, climatic impacts

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