

The 33rd Applied Geography Conference

Program and Proceedings

October 20-23, 2010

**Sheraton Fort Worth Hotel
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The 33rd Applied Geography Conference

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The 33rd Applied Geography Conference

CONFERENCE AT A GLANCE

Wednesday, 10/20/2010

2:30 pm – 5:00 pm: Downtown Fort Worth Walking Tour

5:00 pm – 7:30 pm: Registration

6:00 pm – 7:30 pm: [Keynote Session] Practicing Geography

7:30 pm – 9:30 pm: Opening Reception (Driftwood)

Thursday, 10/21/2010

7:30 am – 3:00 pm: Registration

7:30 am – 3:00 pm: Poster Presentations

8:30 am – 10:00 am: Session T11 [Retail Power Day] Map
Communication and Technology Issues

8:00 am – 10:00 am: Session T12 Education

8:30 am – 10:00 am: Session T13 Applied GIS 1

8:30 am – 10:00 am: Session T14 Physical Geography

8:30 am – 10:00 am: Session T15 Impacts of Climate Variability and
Change

10:00 am – 10:30 am: Session Break

10:00 am – 3:30 pm: Exhibition and Poster Session Open

10:30 am – 12:00 pm: Session T21 [Retail Power Day] Site Modeling

10:30 am – 12:00 pm: Session T22 Urban/Ethnic Patterns in America

10:30 am – 12:00 pm: Session T23 Applied GIS 2

10:30 am – 12:00 pm: Session T24 Hazards 1: Vulnerability and Risk

10:30 am – 12:00 pm: Session T25 Severe and Extreme Weather

12:00 pm – 1:30 pm: Lunch Break

1:30 pm – 3:00 pm: Session T31 [Retail Power Day] Retail Careers and
Lessons Learned

1:30 pm – 3:00 pm: Session T32 Urban Transportation

1:30 pm – 3:00 pm: Session T33 Remote Sensing 1

1:30 pm – 3:00 pm: Session T34 Hazards2: Warning and Preparedness

1:30 pm – 3:00 pm: Session T35 Surface-Atmosphere Interaction

3:00 pm – 3:30 pm: Session Break

3:30 pm – 5:00 pm: Session T41 [Retail Power Day] Census Changes
and Issues for Applied Geography

3:30 pm – 5:00 pm: Session T42 [Retail Power Day] Ethical Issues in
Applied Geography

3:30 pm – 5:00 pm: Session T43 Remote Sensing 2
3:30 pm – 5:00 pm: Session T44 Hazards3: Perception and Impacts
3:30 pm – 5:00 pm: Session T45 Forest/Biogeography
5:00 pm – 7:00 pm: Dinner Break
7:00 pm – 9:00 pm: Conference Reception (Driftwood)

Friday, 10/22/2010

7:30 am – 12:00 pm: Registration
8:00 am – 10:00 am: Session F11 [Retail Power Day] Retail Research
8:30 am – 10:00 am: Session F12 Development and Sustainability
8:30 am – 10:00 am: Session F13 Tools for Research in Geography
8:30 am – 10:00 am: Session F14 Geography and HIV/AIDS
8:30 am – 10:00 am: Session F15 River, Aquifer, and Seawater
10:00 am – 10:30 am: Session Break
10:30 am – 12:00 pm: Session F21 [Retail Power Day] Retail Business Education
10:30 am – 12:00 pm: Session F22 Wastes, Scrap, and Recycling Issues
10:30 am – 12:00 pm: Session F23 Emerging Innovations in Geoinformatics
10:30 am – 12:00 pm: Session F24 Medical Geography
10:30 am – 12:00 pm: Session F25 Water and Watershed
12:00 pm – 1:30 pm: Luncheon with Keynote Speaker, Mr. Andy Taft, President, Downtown Fort Worth, Inc.
1:30 pm – 3:00 pm: Session F31 Geographic Areas for the 2010 Census and the American Community Survey
1:30 pm – 3:00 pm: Session F32 Urban Geography
1:30 pm – 3:00 pm: Session F33 Geographically Weighted Regression
1:30 pm – 3:00 pm: Session F34 Geographical Analysis of Crime
1:30 pm – 3:00 pm: Session F35 Resource Geography
3:00 pm – 3:30 pm: Session Break
3:30 pm – 5:00 pm: Session F41 Census Research
3:30 pm – 5:00 pm: Session F42 Urban-Rural Interface
3:30 pm – 5:00 pm: Session F43 Economic Geography
3:30 pm – 5:00 pm: Session F44 Place and Ethnicity
3:30 pm – 5:00 pm: Session F45 Water Resources
5:30 pm – 6:00 pm: Pre-Field Trip Briefing
6:30 pm – 7:30 pm: Board Meeting

Saturday, 10/23/2010

8:00 am – 2:00 pm: Field Trip (Sheraton Fort Worth Hotel Lobby)

WENDESDAY, October 20, 2010

2:30 pm – 5:00 pm

Downtown Fort Worth Walking Tour

(Free to attend)

Donald I. Lyons and Jeff Roet, *University of North Texas*

5:00 pm – 7:30 pm

Registration

Lightcatcher Foyer

6:00 pm – 7:30 pm

Keynote Session

Practicing Geography: Careers for Enhancing Society and the Environment

Room: *Driftwood*

Organizers and Chairs:

Michael Solem, *Association of American Geographers* and

Janice Monk, *University of Arizona*

Panelists:

Richard Boehm, *Texas State University – San Marcos*

Larry Carlson, *Carlson & Associates*

Robert Czerniak, *New Mexico State University*

Kate Edwards, *Englobe Inc.*

John H. Haake, *J.H. Haake Market Research LLC*

Kingsley Haynes, *George Mason University*

Onyewychi Obirieze, *University of North Carolina - Charlotte*

Ted Payne, *USDA*

Linda Peters, *ESRI, Inc.*

Fred Shelley, *University of Oklahoma*

The AAG's Enhancing Departments and Graduate Education in Geography (EDGE) project is sponsoring a keynote session for the 2010 Applied Geography Conference in Fort Worth, Texas. The session will feature academic geographers and other professionals with experience in public and private sector employment who will discuss key issues affecting career

opportunities for geographers in business, government, and non-profit (BGN) organizations.

Session chairs Michael Solem and Janice Monk will lead the panelists in a structured discussion exploring the following questions:

- 1) What are some of the important trends in labor markets, the economy, and public policy that are likely to have an impact on the careers of geographers in BGN organizations?
 - 2) How can academic departments improve the preparation of geography students with the knowledge, skills, and perspectives they will need for a successful career in BGN organizations?
 - 3) In what ways have geography departments successfully implemented internships, certificate programs, professional master's degrees, and adjunct instructors from BGN organizations to enhance career preparation and professional development?
 - 4) In what ways are BGN organizations not fully tapping the potential of geography for enhancing the work they perform? What can be done to improve awareness and appreciation among employers of what geography offers and, in turn, why they should hire geography graduates?
- The session will also explore cross-sector professional development issues and ideas for strengthening links between employers and academic geography programs.

7:30 pm – 9:30 pm
Opening Reception
Room: *Driftwood*

THURSDAY, October 21, 2010

7:30 am – 8:30 am

Map/Poster Setup

Room: *Driftwood Hallway*

Organizers: Chetan Tiwari and Pinliang Dong, *University of North Texas*; Mark Kalmbacher, *J C Penny*

8:30 am – 10:00 am

Session T1

Map Communication and Technology Issues [Retail Power Day]

Room: *Spicewood*

Panelists:

Chetan Tiwari, *University of North Texas*

Pinliang Dong, *University of North Texas*;

Mark Kalmbacher and Betty Picard, *J C Penny*

Education (8:00 am – 10:00 am)

Room: *Cap Rock*

Chair: Richard G. Boehm, *Texas State University-San Marcos*

EXAMINING CAREER PREPARATION FOR GEOGRAPHY MAJORS: A POST-GRADUATE SKILLS SURVEY

Judy Behrens, Richard Boehm, and Michael Scholz

Texas State University-San Marcos

The health of an academic discipline can, in part, be measured by its ability to attract students to undergraduate and graduate degree programs. The general effectiveness of an individual academic program can be ascertained by examining the extent to which program graduates are prepared for effective job performance and career progression. As one of the largest undergraduate geography programs in the country, with corresponding vigorous graduate and Ph.D. programs, the Department of Geography at Texas State University offers a variety of academic pathways for students to acquire the skills and competencies that are needed for successful integration into the discipline-related workforce. A post-graduate skills survey of department alumni was conducted (1) to identify valuable knowledge, skills, and training that were developed while attending Texas State, (2) to identify skills and competencies that could be

added to the curricula in geography programs to enhance program effectiveness, and (3) to gain insight into alumni employability, job satisfaction, and career progression.

USING GEOGRAPHY TO HELP TEACH HISTORY: DUAL-ENCODING HISTORY LESSON PLANS

Lisa Tabor and John Harrington, Jr., *Kansas State University*

It is startling how little most Americans know about the world. Geography education is the key to improving geographic literacy and current geography education programs are growing in number and strength. How do we teach more and better geography? Use of the psychological theory of dual-encoding to integrate geography and history lesson planning is one method to bring more geography into the classroom, given the dominant role of history in the K-12 social studies curriculum. As part of the Kansas Geographic Alliance programmatic activity, Kansas history and geography standards were assessed to identify candidate themes for development of dual-encoded lesson plans. Five workshops were delivered to share these dual-encoded lesson plans during in-service for K-12 teachers. Teachers at the workshops provided assessment and feedback of the material. We conclude that considerable progress can be made in geography education. Not only will the knowledge provided demonstrate the impact and significance of geography to history teachers but it will also advance teacher content and pedagogical knowledge, and most importantly students will learn both geography and history better.

"DEAD ENDS": RECONSIDERING THE INFLUENCE OF PLACE TO IMPROVE STUDENT LEARNING

Jennifer Speights-Binet, *Samford University*; Christa Boske, *Kent State University*; and Lillian McEnery, *University of Houston, Clear Lake*

This study explores the influence of *place* on student learning by examining the spatiality of children's lives within deep-rooted community boundaries near Martin Luther King Boulevard in a large southern metropolitan city. The analysis of data, gathered through semistructured interviews, student community map-making, field notes, and written narratives reveal that despite efforts made by school administrators to change the climate and culture of the middle school, the influence of *place* was embedded in how students understood themselves and personal aspirations. The implications suggest school leaders deepen their empathic responses and understanding regarding the significance of *place* in schooling children. This paper illustrates how a simple mental mapping exercise has the

potential to affect school leadership initiatives and guide curricular and school policy decisions.

REFLECTIONS ON THE ART OF TEACHING LANDSCAPE EXPLORATION

Jeffrey William Lash, *University of Houston-Clear Lake*

EDUCATION AND THE APPLIED GEOGRAPHY OF WATERSHED

MANAGEMENT

Richard G. Boehm, Carmen Brysch, and Judy Behrens, *Texas State University-San Marcos*

How do you teach the art of landscape exploration? What's the best pedagogy for guiding a student's experience of a place? How do you help students connect myriad place-based experiences in order to synthesize geography? This paper draws on the author's reflection on these questions in the context of a ten-day geography of Texas field trip. A model linking learning theories to field-based geography education is presented and used to evaluate the effectiveness of various learning activities. The model provides geography educators with the means to assess whether or not their pedagogy will foster significant learning. Keywords: Geography, fieldwork, pedagogy, experiential education.

Applied GIS 1

Room: *Llano*

Chair: Stephanie Renee Long, *Tarrant County Community College and HDR Engineering, Inc.*

THE APPLICATION OF GIS IN THE ENVIRONMENTAL IMPACT ANALYSIS OF TRANSMISSION LINE ROUTING

Stephanie Renee Long, *Tarrant County Community College and HDR Engineering, Inc.*

In 2005, Senate Bill 20 (SB 20) required 5,880 additional megawatts by January 1, 2015 and directed the designation of Competitive Renewable Energy Zones (CREZ). This bill also ordered the Public Utility Commission of Texas (PUCT) to devise a transmission plan with enough capacity to supply customers with the additional electricity from renewable resources. Once the PUCT chose the companies to implement this plan, those companies were then able to choose consulting firms capable of delineating and evaluating possible routes for the transmission lines and preparing an Environmental Assessment (EA) and Alternative Routing Analysis for their proposed 345kv transmission line projects.

The methods used by GIS staff members from one of these consulting firms will be thoroughly discussed and will include project tasks such as GIS

data collection, reconnaissance surveys, environmental constraints mapping, determination of possible route alternatives, proposed study area boundary creation, preparation for public meetings, extensive custom geoprocessing models, and development of figures to support expert testimony and document submittal.

The main goal is to demonstrate the technical ability of GIS professionals in the execution of an environmental impact analysis in regards to transmission line routing.

CAPACITY BUILDING FOR COLLABORATIVE GEOSPATIAL DATA DEVELOPMENT

Matthew J. Gerike, *University of Missouri*

Few argue the importance of having accurate, detailed, and up-to-date spatial data available for emergency response applications. However, emergency responders are only one of many users of local level spatial data. It is also costly in time and money to develop and maintain comprehensive data sets.

The Missouri GIS community developed and tested a process to overcome this problem by fostering federal, state, university, regional, and local partnerships. Working together, we built capacity for mutually beneficial spatial data development. These data development projects include creating new data, reviewing existing data, enhancing location accuracy or attribute data, maintaining the now-current data sets, and sharing these data across multiple applications.

Missouri continues to apply, develop, and amend this process. The lessons learned through implementing this process are helpful for other states, regions, and entities looking to reconcile demands for the best possible spatial data while making do with sparse or volunteered resources.

INVESTIGATING THE GEOGRAPHICAL ACCESSIBILITY OF COMMUNITY HEALTH SERVICES IN JINAN CITY CHINA

Yu Wang and Robert Haining, *University of Cambridge*

Access to healthcare has become an important issue for worldwide medical geographers. Since the late 1990s, the Chinese government has started to develop a community health service (CHS) system with the aim of providing primary healthcare for all urban population. As part of an on-going joint project, which studies China's CHS system from a geographical perspective, this research investigates the accessibility of community healthcare in Jinan, one of the first cities to launch a CHS in China. Firstly, a CHS-GIS platform is constructed for collecting and managing the location and service information of community health institutions across Jinan. By applying a gravity model and kernel density method, the study then

measures, maps and evaluates the spatial accessibility and geographical coverage of CHS in the City. In addition, suggestions based on the findings are put forward in this study for the local health bureau to implement improvements in access to CHS.

THE ESTIMATION OF PRIMARY HEALTH CARE ACCESSIBILITY FOR ABORIGINAL RESERVES IN ALBERTA

Olesya Elikan, *University of Calgary*

The role of accessibility to primary health care and its utilization is highly dependent on characteristics of population as people have different abilities in terms of overcoming a distance. Certain demographic and socioeconomic characteristics of population such as income, age, gender and ethnicity have a strong affect on personal mobility. Presence of accessible sources affects individual decision making of utilizing health care. Aboriginal population in Alberta is known to have limited access to health care which becomes a dominating factor of chronic diseases increase. The purpose of this study is to evaluate accessibility to primary health care in the province of Alberta with focus on Aboriginal reserves. Spatial accessibility is represented by geographical distance and travel time to the health provider. In this study accessibility is measured by travel time from patients' locations to nearest primary health care provider using GIS techniques. Two models of accessibility were built based on different datasets of health providers that were available: physicians of Alberta database and health care facilities dataset that includes hospitals, long-term care centers, nursing stations, outpatient clinics and community health centers. Each of this models indicated reserves that have limited or no access to primary care. Comparison of two models revealed differences in accessibility depending on type of provider used in the analysis and helped locating reserves that have no physicians on site and primary health care is only presented by other non-doctor professionals.

Results provide a better understanding of weaknesses within health delivery system in Aboriginal communities and allow indicating communities that require immediate attention because of their lack of access to health care and provide an effective decision support tool that can be used in regional health planning.

Physical Geography

Room: *Pheasant Ridge*

Chair: William C. Wright, *United States Military Academy*

HURRICANE IKE STORM SURGE SEDIMENTATION IN TEXAS AND LOUISIANA

Harry F. Williams, *University of North Texas*

Hurricane Ike made landfall at Galveston Texas on September 13th, 2008. A storm surge in excess of 3 m struck the upper Texas coast and part of southwest Louisiana's Chenier Plain, situated in the northeast quadrant of the landfalling hurricane. The storm surge caused widespread flooding many tens of km inland and transported large amounts of offshore and littoral sediments into nearshore subaerial environments. This study documents the character of storm surge sedimentation in southeast Texas and southwest Louisiana, based on field surveys made in January 2009. The storm surge deposit exhibits two distinct styles of deposition: thick, sandy washover fans, typically extending about 150 m inland, deposited as traction load; and a thinner, finer, more organic-rich, blanket of sediments, extending, in places, at least 2700 m inland, deposited from suspension. Preservation of the storm surge deposit was assessed by a repeat survey made in January 2010. The study findings show that storm surge sedimentation can extend a considerable distance inland and that hurricane-derived sedimentation can be a significant contributor to long-term sedimentation in nearshore environments along the Gulf Coast.

GIS-BASED ANALYSIS AND MODELLING OF COASTLINE POSITIONAL CHANGES

Sajid Rashid Ahmad and V. Chris Lakhan, *University of Windsor*

This research focussed on the utilization of geographical information systems (GIS) analysis and modelling approaches to assess, visualize and predict the positional changes in width and configuration of a dynamic coastline. Historical coastline advance and retreat data (1941-1987) from the coast of Guyana, supplemented with Landsat TM and ETM+ data (1992 and 2006) were analyzed with the ArcGIS v. 9.2 software. With the assumption that the historical rate of coastline change provided the best estimate for predicting future changes, long-term rates of coastline change were generated with version 4.1 of the Digital Shoreline Analysis System (DSAS). The GIS results permitted visualization of sections of the coastline where temporal phase shifts could be related to spatial changes caused by either the advance or retreat of the coast. The coastline for the year 2016 was predicted with the DSAS, an extension to ArcGIS v. 9.2, thereby highlighting spatial positions along the coast where there could be occurrences of either accretion or erosion.

DEVELOPMENT AND EVALUATION OF ELEVATION PROFILES AND SLOPE MAPPING METHODS

William C. Wright and Michael D. Hendricks, *United States Military Academy*

Determining accurate slope and terrain elevation profiles are extensively used in today's society for numerous reasons. GPS and GIS provide numerous different data sources for the creation and representation of these values. Here we present two case studies where we created map products using two different techniques to represent slope and elevation profiles. The methods used are based off the availability of different data sources and availability of the information. The first site was at West Point, NY, where we used DEM data sets to generate our values. The other site was just outside Fort Greely, AK, where we used GPS to generate data. We evaluated the accuracy of different resolution DEMs, as well as, corrected versus uncorrected GPS. Here we provide our findings in the form of RMSE slope values for each dataset as compared to a survey conducted with traditional total station equipment as ground truth.

REPEAT PHOTOGRAPHY DOCUMENTS SHORT-TERM LANDSCAPE CHANGES IN GEOTHERMAL FEATURES IN YELLOWSTONE NATIONAL PARK, WYOMING

William D. Butler, *Kansas State University* and David R. Butler, *Texas State University-San Marcos*

The U.S. National Park Service (NPS) provides no information in tourist literature on the changing nature of geothermal features that visitors will see during visits to Yellowstone National Park, Wyoming. Repeat photographs were taken in 2005 and 2009 of geothermal features in the Artists Paint Pots and Mammoth Hot Springs basins, located in northern Yellowstone. Features examined include hot springs, travertine and sinter deposits, and general basin morphology. Loci of flow at Mammoth Hot Springs shifted dramatically over the four-year period. Travertine coloration resulting from cyanobacteria colonization fluctuated with shifting hydrothermal flows. Water levels in hot springs rose and fell dramatically in both basins. Park visitors returning to a site after several years may unexpectedly see a substantially altered landscape as a result of these processes. The NPS should offer literature that prepares visitors for the likelihood of pronounced visual changes in geothermal features.

Impacts of Climate Variability and Change

Room: *Driftwood*

Chair: Kent McGregor, *University of North Texas*

ANALYSIS OF ATMOSPHERIC ANOMALIES DURING THE 2009-10 EL NIÑO EVENT AND IMPACT ON WATER RESOURCES IN THE SOUTHWEST

Kent McGregor, *University of North Texas*

In the fall of 2009, the 5th strongest El Niño event on record developed in the tropical Pacific and had a pronounced effect on weather in the U.S. during the winter and following spring. The changes in sea surface temperatures caused profound changes in atmospheric circulation patterns and produced a number of unusually strong winter storms tracking across the country. The related atmospheric anomaly patterns were reconstructed using data from the NOAA Reanalysis Model. These variables included, pressure, temperature, precipitation, vertical velocity, humidity and winds among others. The analysis produced a surprisingly complex pattern in which some parameters revealed interpretable results while some did not. One important impact was an increase winter precipitation across the southwest U.S. This is consistent with previous events and is an important input to the water resources of the region.

PREPARING FOR THE POTENTIAL EFFECTS OF CLIMATE CHANGE ON AGRICULTURAL SYSTEMS: IMPROVING RESILIENCE AND REDUCING VULNERABILITY

Desserae K. Shepston, *Texas State University-San Marcos*

Globalization has impacted the production and consumption patterns of food such that the places of production are frequently disconnected from the places of consumption, both spatially and temporally. Changes in climate will mean that global food security will depend upon the increased resilience and reduced vulnerability of agriculture social-ecological systems at local scales. Accurate assessment of agricultural systems' resilience and vulnerability will require examination of cross-scale linkages. Such assessments will be increasingly necessary to mitigate the potential detrimental effects of climate change. I will present a framework that can be used in determining current levels of resilience and aspects of agriculture that are vulnerable to climate change. This framework will provide stakeholders with considerations for addressing the future affects of climate change on local food security. From the results of the assessments, stakeholders can then establish an action plan for increasing local food security in the face of climate change.

CLIMATE CHANGE KNOWLEDGE AND PERCEPTIONS OF TEXAS STATE UNIVERSITY GEOGRAPHY ALUMNI

Elizabeth G. Ray, *Texas State University-San Marcos*

To examine knowledge and perceptions of climate change, this study undertakes a survey of alumni of the largest academic geography program in the United States in the highest carbon dioxide emitting state in the nation. Texas State geography alumni were chosen because the programs within the Department of Geography prepare students to work in many fields expected to be impacted by climate change ranging from biogeography to urban planning. This study intends to gauge the levels of accurate knowledge and perceptions of personal and global risks from climate change to learn what perspectives they will bring to their roles as professional geographers. The state of Texas presents a relevant study area for the perceptions of climate change due to its overall contributions to global climate change and its population's vulnerability to the effects.

A college degree in geography does not presuppose either accurate knowledge of the causes and effects of climate change or the personal will to take action. This study will examine the accuracy of the graduates' knowledge and attempt to gauge their levels of concern for climate change at local and global scales. The supposition that Americans consider climate change to be a greater problem for other people and for geographically distant places than for themselves will also be investigated.

10:00 am – 10:30 am

Session Break

10:30 am – 12:00 pm

Session T2

Site Modeling [Retail Power Day]

Room: *Spicewood*

Chair: Tony Hernandez, Ryerson University

Panelists:

Larry Carlson, *Carlson & Associates*

David Huff, *University of Texas at Austin*

Tony Lea, *Environics Analytics*

Contemporary Urban and Ethnic Patterns in America

Room: *Cap Rock*

Chair: Milton E. Harvey, Kent State University

Organizers: Norah Henry and John Frazier, Binghamton University

A SPATIAL DYNAMIC EXAMINATION OF ASIAN INDIANS IN AMERICAN GATEWAYS, 1980-2008

Milton E. Harvey, Kent State University, Kevin Butler, University of Akron, Norah Henry and John Frazier, Binghamton University

ASIAN INDIANS IN AMERICAN GATEWAYS: A MICRO-SCALE ASSESSMENT OF METROPOLITAN STRUCTURES

Norah Henry and John Frazier, Binghamton University, Kevin Butler, University of Akron, and Milton E. Harvey, Kent State University

SPATIO-TEMPORAL VARIATIONS OF AIR CONDITIONS AND ASTHMA HOSPITAL VISITS AMONG ETHNIC GROUPS IN MISSISSIPPI, 2003-2005

Jay Lee and Saad Algharib, Kent State University, Fazlay Faruque, University of Mississippi Medical Center, Lin J. Lee, Urban Operations Research, Inc., and John Barr, Kent State University

Applied GIS 2

Room: *Llano*

Chair: Timothy Dolney, *Pennsylvania State University, Altoona*

POLICY DRIVEN GIS - UNITING COMPLIANCE WITH MUNICIPAL INFRASTRUCTURE NEEDS

Rick Zarate, Megan Andring, and Mark Valentino, *Freese and Nichols, Inc.*; Charlotte Baldwin, *Fort Hood DPW*

Under Phase II storm water regulations, small municipal separate storm sewer system (MS4) operators, including municipalities, counties, and military installations are required to map their storm sewer systems to aid in the detection of illicit discharges. This task can be daunting for small MS4 operators that currently do not have a geographic information system (GIS) to manage their storm sewer systems. As a result, some small MS4 operators have expanded their municipal GIS to include their storm sewer systems.

Here we present information on the development of a storm sewer system GIS for the Fort Hood Military Installation in Central, Texas for compliance with Phase II storm water regulations. Mapping the storm sewer system at a military installation presents unique challenges because system design and the location of individual components vary with regard to specific military activities. Furthermore, access restrictions and training areas limit the connectivity of the overall system. For this project, the

storm sewer system was mapped using a combination of high sensitivity GPS, GIS, and custom databases. The scope of mapping activities at Fort Hood was expanded to include aspects of asset management, such as conditional evaluation of storm sewer system features and collection of high precision data for future modeling and storm water master planning.

This project provides an example of how environmental policy can provide the impetus for improving municipal GIS capabilities for better planning, operations, and maintenance of public infrastructure. Viewed in this manner, compliance with Phase II storm water regulations presents an opportunity for small MS4 operators to develop a GIS assessment management system to coordinate their ongoing storm water infrastructure needs.

DRIVING DOWN CORPORATE CARBON EMISSION THROUGH ALTERNATIVE TRANSPORTATION METHODS: A GIS APPROACH

Shunfu Hu, *Southern Illinois University, Edwardsville*

In the United States, the transportation sector accounts for approximately one-third of greenhouse gas emissions and is the fastest-growing major source of greenhouse gases. Meaningful action to reduce greenhouse gas emissions requires organizations/corporations to adopt appropriate alternative transportation methods. For example, fast food restaurants such as Kentucky Fried Chicken (KFC), McDonald, and Wendy's utilize materials that need to be transported from places hundreds of miles away. This research project estimated and compared the **carbon emission (CO₂) for a KFC restaurant located in Glen Carbon, Illinois with three transportation methods: trucks, truck flaps, and trains. It was found that using truck flaps could reduce CO₂ by 6% and using trains could reduce CO₂ by almost 50%.**

URBAN CARBON COUNTING

Sean Tierney, *University of North Texas*

In an effort to meet the Kyoto targets, and in accordance with the US conference of mayors climate protection agreement, cities are enacting policies aimed at carbon reduction for municipal government operations, but also private industries and residents. To baseline their emissions levels, cities are taking greenhouse gas inventory reports and the methods used to calculate emissions are varied. Comparing the divergent accounting methods used by some of the largest cities reveals the potential problems in tabulating emissions.

USING NEIGHBORHOOD STATISTICS AND HILLSHADING WITHIN GIS TO IDENTIFY POTENTIAL LOCATIONS FOR THE SEASONAL STORAGE OF SOLAR HEATING (S³H)

Timothy Dolney, *Pennsylvania State University, Altoona*

This research presents the use of GIS to identify potential locations of the Seasonal Storage of Solar Heating (S³H) within the state of Pennsylvania. The S3H utilizes a large pit to store thermal energy collected during the warm months for later use in the cold months. To maximize its overall efficiency, S3H must be built where several locational parameters occur in unison: abandoned mine lands (AMLs), institutions, soil type, and land use. These parameters were mapped using GIS with potential locations identified through the applications of neighborhood statistics. These locations were further defined using hillshades. In the end, site visitations were performed to ultimately identify potential locations.

Hazard 1: Vulnerability and Risk

Room: *Pheasant Ridge*

Organizer: Burrell Montz, *East Carolina University* and Graham A. Tobin, *University of South Florida*

Chair: Burrell Montz, *East Carolina University*

USING VULNERABILITY AND PLANNING TO MEASURE SUSTAINABILITY IN COASTAL NORTH CAROLINA

Gary Ian Monitz, *East Carolina University*

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

EXAMINING GEOGRAPHIC VISUALIZATION AS A TECHNIQUE FOR INDIVIDUAL RISK ASSESSMENT

William M. Bass, and R. Denise Blanchard, *Texas State University-San Marcos*

This research examined the extent to which geographic visualization might serve as a technique for assessing and understanding levels of personal risk. An exercise was created, consisting of a series of five animations, representing five historical flood events in flood-prone central Texas and displayed on an Internet site along with a survey questionnaire. Three questions guided this research: 1) To what extent can individuals correctly rank levels of intensities among five historical rainfall events, and, therefore levels of risk after viewing visualizations; 2) Does professional training and experience in a hazards-related field prove to be an advantage for correctly identifying and ranking levels of risk among the rainfall events after viewing visualizations; 3) Is prior experience with a flood, or any other hazard occurrence a factor in whether individuals can correctly assess levels of risk in visualizations depicting rainfall events? Our study demonstrated that computer-interested individuals are willing and able to access website information related to historical flood events, and interact with that website in viewing, interpreting and ranking computer animations of featured events; and, for the most part, regardless of prior experience, or workplace training, can, more or less, distinguish between levels of intensity of events. However, due to the fairly recent introduction of geographic visualization in hazards research, we call for more work in this area, and have offered an extensive list of research questions for assessing the viability of this technique for more accurate risk assessment and management at the individual level.

AN EXAMINATION OF DIFFERENTIAL VULNERABILITY TO HURRICANES AMONG COLLEGE STUDENTS

Graham A. Tobin, Jason L. Simms, and Margarethe Kusenbach, *University of South Florida*

Research into the vulnerability of college students to hurricanes throughout the Southeast and Gulf regions of the USA are scarce, which is surprising given the large number at risk. An important question is whether students can be treated as a homogeneous group relative to hurricane vulnerability, or whether subgroups, based on such variables as gender, ethnicity, and socio-demographic traits play a role as established in the general population. Variation within student population vulnerabilities may necessitate different approaches to hurricane mitigation. The few studies that have been done show some variability amongst students with

potential sub-grouping. Our study of 500 students uses multivariate statistical methods to examine this issue, including discriminant function analysis to determine whether or not it is possible to identify discrete subgroups within the student population. Results indicate that while some minor differences are present among certain groups, in general well-defined subgroups do not exist. These findings support the hypothesis of a “leveling effect” of higher education that creates a degree of homogeneity among students related to hurricane vulnerability.

Severe and Extreme Weather

Room: *Driftwood*

Chair: Richard W. Dixon, *Texas State University-San Marcos*

CLIMATOLOGICAL DESCRIPTION OF TORNADOES ASSOCIATED WITH GULF COAST-LANDFALLING HURRICANES (1950-2005)

Todd W. Moore and Richard W. Dixon, *Texas State University-San Marcos*

This study provides climatological descriptions of tornadoes associated with Gulf Coast-landfalling hurricanes during the period 1950 to 2005 using GIS and statistical methods. Specific climatological descriptions provided are hurricane-tornado activity per hurricane, hurricane-tornado physical characteristics, and temporal and spatial characteristics. Our analysis indicates that, while hurricane-tornadoes are a common phenomenon associated with hurricane landfalls along the Gulf coastline, their frequency is variable. Some hurricanes produce no tornadoes while others produce more than 100. Relatively weak hurricane-tornadoes and those with relatively short path-lengths and narrow path-widths are most common. Hurricane-tornadoes occur most often in August and September, during afternoon hours, and after their associated hurricane landfall. Hurricane-tornadoes have occurred throughout the Gulf Coast region, but most are located within 200 km of the coastline. Lastly, hurricane-tornadoes are most often located to the right of their associated hurricane center, relative to directional heading.

WEEKLY VARIATION IN SEVERE THUNDERSTORM WARNINGS AND SEVERE THUNDERSTORM REPORTS

Kevin M. Barrett, and Richard W. Dixon, *Texas State University-San Marcos*

Severe thunderstorm warnings issued by the National Weather Service and severe thunderstorm reports obtained from the National Climatic Data Center were analyzed to ascertain potential bias in the issuance of warnings favoring certain days of the week. Eight National Weather

Service Warning Forecast Office County Warning Areas (CWA) representing regions of Texas and Oklahoma were studied. Seven of the eight CWA show no significant trend that favors specific days of the week. The Amarillo Warning Forecast Office CWA exhibited a statistically significant trend for warnings favoring the middle part of the traditional workweek. Spatial analysis of the Amarillo CWA indicated that rural counties are less likely to receive warnings during the weekend. Results indicate that daily variations in the number of warnings have been lessened by technology through the modernization of the National Weather Service during the middle part of the 1990s.

HISTORICAL CLIMATOLOGY OF EXTREME WINTER WEATHER EVENTS IN TEXAS

Susan L. Peters, and Richard W. Dixon, *Texas State University-San Marcos*

Texas weather exhibits wide seasonal variability. Within the same year the state can be struck by a major hurricane along the coast during summer and a blizzard in the Panhandle during the winter. A typical Texas winter begins in late October and ends in early April. However, isolated events have been reported well into May. Texas experiences four different forms of extreme winter weather; blizzards, snow events, ice events and winter or “mixed” events. Winter weather is more common in the northern/northeastern regions but does every so often occur in the most southern regions of the state. The purpose of this research was to determine if there are any trends or spatial patterns to the extreme winter weather events that have occurred over the last 50 years between 1959 and 2009.

12:00 pm – 1:30 pm

Lunch Break

1:30 pm – 3:00 pm

Session T3

Retail Careers and Lessons Learned [Retail Power Day]

Room: *Spicewood*

Chairs: Eugene Tettey-Fio, *Binghamton University* and Ken Smith, *J C Penny*

Panelists:

Eugene Tettey-Fio, *Binghamton University*

Ken Smith, *J C Penny*

John Frazier, *Binghamton University*

Larry Carlson, *Carlson & Associates*

Doug Schnell, *Panera Bread*

Clay Hallman, *Simon Property Group*

Brett Bayduss, *Site Selection Group*

Tom Dwyer, *Dutch Hill Consulting*

Matt Panfel, *International Council of Shopping Centers*

Matt Ryan, *Rockland County Planning*

While business and retail geography professionals have relied on integrating both business and geographic skills to help corporations with location strategy, real estate market analysis, and marketing, academic institutions have focused on a compartmentalized approach to training students for the field. In most cases, turf wars between various schools within the university prevent students from taking all the relevant courses to prepare them for business geography careers. In other cases courses are structured in ways that disconnect geography from business or business from geography. That geographic skills are critical to corporations has become evident as premier business schools have started incorporating geo-technology (GIS) in their curriculums and business graduates are competing with geography graduates for the same jobs. To make our graduates more competitive, they would need an expanded inventory of skills and this leads to some questions involving Business Geography Education:

- 1) How do we best prepare geography graduates for a more competitive business world?
- 2) What should we be doing besides site and real estate location analysis to level the playing field against business school graduates with geo-technology skills?
- 3) How has the field evolved over the years and in what ways?
- 4) What specific skills should recent graduates bring to the entry level job?
- 5) What should be added or taken away from the curriculum to streamline training for a more competitive market?

This panel brings together a) expert business professionals with many years of experience, b) people in academia interested in improving the chances of their graduates in business and retail geography careers and c) recent graduates to share experiences and propose ways to make academic training more relevant.

Urban Transportation

Room: *Cap Rock*

Chair: David Wong, *George Mason University*

WHY TAKING THE METRO FOR COMMUTING IN WASHINGTON, DC AREA?

Min Sun, and David Wong, *George Mason University*

The Metro system in Washington, DC is the second busiest rapid transit system in the U.S., but is also among the ones with highest fares after several fare hikes in recent years. While the public has been encouraged to take public transportation, taking the Metro with the ever increasing fares and associated costs may not seem logical. Nevertheless, the ridership has not declined with the increasing fares. In this paper, we compare the costs of commuting taking the Metro/public transportation with driving in the Fairfax County region, a suburb outside of Washington, DC. Taking the Metro/public transportation involves many possible combined modes. We identify factors determining the costs of all combined modes and develop cost surfaces. We found that without subsidies from employers, driving is the logical choice under most scenarios. If subsidies were moved, taking Metro/public transportation does not make economically sense in most cases.

GIS ANALYSIS OF THE DCTA A-TRAIN PASSENGER RAIL IN DENTON COUNTY, TEXAS

Clint C. Petty, *University of North Texas*

With increasing population in Denton County, traffic congestion is an ever worsening problem. The college campuses of the University of North Texas (UNT) and Texas Women's University in the city of Denton draw a substantial number of commuters throughout the year. The Denton County Transportation Authority's (DCTA) currently under construction A-train passenger rail, located parallel to I 35 E from Carrollton to Denton, will serve to alleviate traffic congestion in the area. In this paper, a geographic information system (GIS) will be utilized to compare current drive times to UNT with estimated travel times via the DCTA A-train. The service area of each A-train station will also be examined in conjunction with census block data to estimate the potential rider population for which the rail service will be available. Under normal traffic conditions, it is much quicker to drive from the northwest Dallas study area to Denton. However, with certain realistically modeled traffic congestion problems, the A-train actually becomes the faster commute. Well over 500,000 people lived within a fifteen minute drive of a rail station, making the A-train a viable and accessible alternative to driving.

ASSESSING URBAN WALKABILITY: A SUITABILITY MODEL RATING EASE OF TRAVEL WITH LIMITED RELIANCE UPON PERSONAL AUTOMOBILE TRAVEL IN AUSTIN, TEXAS

David Thomas Hickman, *Texas State University-San Marcos*

Research in environmental justice and urban planning suggests that communities could benefit from increased access to safe, walkable streets. A tenant of new urbanism, walkability measures characteristics of the built environment that promote active methods of transportation. Despite a growing body of literature, the lack of a universal formula for walkability scoring creates difficulty comparing diverse regions.

This research suggests a general paradigm and exemplary application by which communities may be compared using GIS. A model of the Austin, Texas region was created that rates walkability on three major criteria: access to amenities, ease of travel, and barriers to walkability. Within this application, shortest network path to nearest city park represents the first factor; ease of travel is determined by intersection density and shortest network path to bike routes; while local crime and extreme slope variations in the topography of Austin model barriers to walkability.

THE ACCOUNT OF SPATIAL PRIVILEGES BY WORKING OUT OF TRANSPORT STRATEGIES OF REGIONS IN RUSSIA AND THE CIS

Vladimir Bugromenko, *R&C "Geogracom", Moscow, Russia*

The fresh wording of a subject of geography of transport is used: an estimation of consequences (economic, social, ecological, geopolitical, demographic, on safety) developments of territory by means of the spatial privileges created by a transport network. The modern tool for realization of such approach is the model of Integrated Transport Accessibility (ITA) which includes an assessment of two kinds of reliability – technical and topological.

On an example more, than 30 regions of Russia and the CIS where long-term transport strategy are developed, is defined that the share of topological reliability in the general reliability of transport systems increases from 1-5 % in the developed regions to 15-18 % - in developing. It means that by means of management of spatial patterns in transport networks it is possible to get 15-18 % of effects (financial, ecological, on safety, etc.). Thus, it is answered in the affirmative on a question, whether the geometry and space topology has any cost?

The system of support of decision-making on strategic transport planning «Geogracom 6» which is introduced in many regional authorities is created. The basic sections in regional transport strategy in which spatial privileges for the population and the economy are estimated is following:

the minimum transport standard, a perspective transport skeleton of territory, financial scenarios of spatial development.

Remote Sensing 1

Room: *Llano*

Chair: Mandy Munro-Stasiuk, *Kent State University*

COUNTY-LEVEL POPULATION ESTIMATION USING KNOWLEDGE-BASED CLASSIFICATION OF LANDSAT TM IMAGES AND REGRESSION MODELS

Pinliang Dong, and Anjeev Nepali, *University of North Texas*

This paper presents a knowledge-based model for classification of Landsat TM images, and linear regression and geographically weighted regression (GWR) models for county-level population estimation using classified images and 2000 census data. For efficient and effective extraction of residential areas, the knowledge-based model was built using spectral responses of Landsat TM band 4 (near infrared), band 7 (mid-infrared) and five spectral indices, namely Normalized Difference Vegetation Index (NDVI), Modified Normalized Difference Water Index (MNDVI), Normalized Difference Built-up Index (NDBI), Normalized Difference Blue Band Built-up Index (NDBBBI), and Wetness Index (WI). Results from Denton County and Collin County in Texas show that the overall image classification accuracy is over 90%, and that total population estimation errors are less than 5%.

MAPPING CAROLINA BAYS OF THE RAEFORD QUADRANGLE, HOKE COUNTY, NORTH CAROLINA

Lee Stocks, Jr., *University of North Carolina at Pembroke*

Carolina Bays are geomorphic surface features which are largely elliptical with long axes trending in a general northwest-southeast direction, found in the Atlantic Coastal Plains from Florida to New Jersey. They are generally depressed several feet with raised sand rims found on the southeast side. The vast number found in the Carolinas has led to the popularization of the name. At present, multiple genesis hypotheses attempt to explain the origin of these odd, sinkhole-like features. These range from extraterrestrial meteor collisions, to wind and wave action forming erosive currents that create their distinctive elliptical shapes. Theories attempt to account for this uniform orientation, as well as varying sizes, distribution, ages, soils, vegetation and geology. Sizes range from a few thousand square meters to several square kilometers and can cover 50-60% of the land surface area in some quadrangles, with overlapping and truncation being common.

Missing from the literature is a concise method for mapping these features using modern high-resolution datasets in a spatial framework. In this study a geographic and spatial analysis is performed using multiple layers to explore the best data and method for mapping Carolina Bays within the USGS 1:24,000 Raeford, North Carolina Quadrangle. Derived from this case study are quantity, distribution, area, length, width, ellipticity, and orientation of mapped Carolina Bays for future spatial and morphometric exploration.

USING LANDSAT DATA TO TRACK MILPA CYCLES, YUCATAN MEXICO

David Korte, and Mandy Munro-Stasiuk, *Kent State University*

Milpa agriculture is a type of swidden agriculture practiced by the past and present day Maya. Small fields, traditionally no more than 2-5 acres, are cultivated for 2-3 years. The fields are then left fallow for 7-20 years to allow the forest to regrow. A new field is cultivated for 2-3 years and the cycle repeats itself. Ideally a field should be left fallow for at least 10 years to regenerate soil fertility and prevent soil erosion.

The economy for the modern day Maya has been migrating from sustainability to money. The goals of this project are to determine if Milpa cycles can be observed using Landsat data and how they might be changing as a result of the pressures of a money based economy.

Fields were randomly selected and tracked during a time period between 1984 and 2009. A simple Normalized Digital Vegetation Index (NDVI) was used to determine healthy vegetation and fallow fields. Preliminary results indicate that Milpa cycles are detectable using Landsat data, although based on available imagery, there is no evidence that the length of time fields are fallow is changing.

Hazard 2: Warning and Preparedness

Room: *Pheasant Ridge*

Organizers: Burrell Montz, *East Carolina University* and Graham A. Tobin, *University of South Florida*

Chair: Phil Chaney, *Auburn University*

RESPONSE TO SHORT-FUSE WARNINGS: WHAT WE KNOW AND DON'T KNOW

Burrell Montz, *East Carolina University*

Although advances in meteorological and hydrological sciences lead to more accurate and timely warnings, losses are not decreasing. We know that vulnerable populations may be unable to take appropriate action, but others simply make the wrong decision, sometimes for what are good

reasons. How people make decisions under conditions of uncertainty and how and why these decisions differ among various groups, based on such factors as local circumstances, location, age, gender, and culture are important considerations. Part of one's response relates to people's perceptions, but it also involves how uncertainty is communicated. Critical to this is how various actors in the process recognize this and incorporate it into what they do (with respect to forecasts and warnings, for example). An overview of what we know can begin to move us toward focusing on those aspects of warning and warning response that are most salient to both forecasters and emergency managers.

DECISIONS TO INCLUDE HOUSEHOLD PETS IN THE EVACUATION PROCESS: A CASE STUDY OF HURRICANE GUSTAV

Courtney N. Thompson, *University of Alabama*

In this study, evacuees from the path of Hurricane Gustav were surveyed concerning their decision to include their household pets in their evacuation plans. Data were collected along two major evacuation routes within the 48-hour window prior to landfall in the southern and coastal regions of Louisiana (generally south of Interstate 10). The regions of New Orleans, Houma, and Lafayette were represented most frequently, as determined by zip code data collected from the surveys. Results revealed a majority of evacuees with pets chose to include them in their evacuation plans, highlighting the significance that household pets play in making timely evacuation decisions. Since the devastating hurricanes of 2005, changes have been made to create more friendly pet policies. This change has pointed out that we now need to research not only how to get people out of danger but also how to include their pets.

WILDFIRE HAZARD AND EGRESS POTENTIAL IN CENTRAL TEXAS NEIGHBORHOODS

Jordan Stewart, and Ron Hagelman, *Texas State University-San Marcos*

Wildfire is a common hazard in areas where urbanization encroaches on undeveloped landscapes. Populations at risk in these environments may face the need to evacuate quickly, especially if their homes are not suitable for shelter in a fire event. Traditional suburban design, often meant to generate a sense of seclusion via non-linear street design and ubiquitous landscaping, can further complicate egress. Traffic bottlenecks during last-minute evacuations have proven deadly in both urban and suburban landscapes. This can be especially true in suburban neighborhoods embedded in the wildland-urban interface (WUI), or on the urban periphery (UP). This study analyzes the conditions of place, morphologies, and traffic bottleneck potential of suburban neighborhoods in the WUI of

Austin, Texas. The purpose of this analysis is to develop a relative ranking of selected WUI neighborhoods based on their hazardousness in relation to wildfire, to investigate the influence of age/morphology on the rank of any one neighborhood, and to illustrate the potential of GIS-based traffic bottleneck analysis on the most and least hazardous neighborhoods. All neighborhoods in the study area exhibited landscape characteristics (based on the seven-point scale utilized) that could serve to thwart efficient evacuation, although many of the smaller developments proved less hazardous than the larger ones. Size of the development was a more important determinant of relative hazardousness than was age or morphology. Bottleneck analysis illuminated the evacuation inefficiencies endemic to most suburban designs as well as the utility of providing one or more exits with neighborhood-wide evacuation in mind.

Surface-Atmosphere Interactions

Room: *Driftwood*

Chair: Robert V. Rohli, *Louisiana State University*

PREDICTING FRACTIONAL SNOW COVER

Clayton J. Whitesides, Matthew H. Connolly, and Jason D. Arbogast,
Texas State University-San Marcos

Global climate change, precipitation variability, and the importance of runoff in mountainous watersheds have highlighted the importance of reliable estimations of available snow pack in recent years. Although several studies have addressed this issue, nearly all of the previous research efforts were heavily dependent on costly in-situ data collected from field surveys. In response to these data collection costs, this study employed Landsat ETM+ imagery, a USGS 30 meter DEM, fuzzy classification, and [statistical](#) techniques, to predict fractional snow covered area in Durango, Colorado. Slope, aspect, elevation, solar radiation, derived fractional snow cover, and derived LAI were processed through classification and regression tree (CART) analysis and an expert knowledge classifier. Study results suggested that LAI and elevation were the primary and secondary predictors of fractional snow covered area. Visual comparisons of the study area and final output maps suggested that model outputs offered a reasonable approximation of ground conditions.

AN INVESTIGATION OF URBAN INFLUENCE ON PRECIPITATION IN THE SOUTHEASTERN UNITED STATES: ENHANCEMENT, BIFURCATION, AND SYNOPTIC CHARACTERISTICS

Anna Trevino, *Louisiana State University*

Urban areas have been shown to influence the amount and distribution of local and regional precipitation. This is exhibited spatially and temporally through varied precipitation amounts in and around urban regions. This study presents a framework for the analysis of precipitation anomalies due to growth in urban land cover. The first objective is dedicated to determining which cities southeast exhibit enhanced precipitation. The second objective consists of a series of spatio-temporal analyses of select cities for evidence of storm bifurcation. The movement of each event will be analyzed for evidence of urban influence using radar-derived precipitation data. If potential storm bifurcation is found, rainfall distribution will be used as a basis for a bifurcation signal. The final objective is to identify synoptic-scale circulation conditions associated with storm bifurcation. It is expected that precipitation enhancement and bifurcation may occur in large cities and may be attributable to frontal or convective systems.

CORRELATING CLIMATE WITH LATE-WINTER WETLAND HABITAT IN THE RAINWATER BASIN, SOUTH-CENTRAL NEBRASKA

Rex Michael Robichaux, and John Harrington, Jr., *Kansas State University*

The Rainwater Basin Wetland Complex of south-central Nebraska is a region of great climatic variability and tremendous ecological importance. The Rainwater Basin Wetland Complex is located at the focal point of the Central North American migratory bird flyway, and supports in excess of twelve million birds during the spring migration period. The physical landscape has been significantly altered from its pre-settlement state by agricultural conversion via the draining of over ninety percent of the native wetlands. Due to the region's highly variable continental climate, interannual wetland water levels are also highly variable and currently unpredictable. Multi-year analysis was used, including the construction of a regional water budget, to study which climatic variables play the most crucial role in the late-winter filling of wetlands. Research objectives were met by analyzing ten cold season climatic variables and an annual measure of wetland area for five years, in order to better understand possible climatic drivers of wetland hydrologic functioning levels in March. Longer time series of winter season climatic information were also assessed to help place the recent and more detailed analysis into a longer climatic context. Research results will aid local management agencies in the future through enhanced knowledge of how climatic variation impacts wetland function. Seasonal precipitation (a positive relationship) and temperature (a negative relationship) were favored by the linear regression analysis.

Annual snow storage from the hydrologic water budget analysis was highly correlated basin-wide flooded hectares.

AERODYNAMIC RESISTANCE OVER SHORT BERMUDA GRASS IN NORTHERN LOUISIANA AT THE BEGINNING OF THE GROWING SEASON

Robert V. Rohli, Yin-Lin Chiu, Vipin Kumar, Steven L., Luigi Romolo, and
Theophilus K. Udeiwgwe, *Louisiana State University*

Aerodynamic resistance is an important biophysical property because it governs the rate of water loss from a vegetated surface to the atmosphere. A three-week experiment in March/April 2010 at St. Joseph Research Station in Tensas Parish, Louisiana involved the calculation of numerous micrometeorological measurements at 60-second temporal resolution. Aerodynamic resistance was computed as a function of roughness length, wind speed, and atmospheric stability. The stability estimates were based on profile measurements of wind speed and temperature within the surface boundary layer to calculate gradient Richardson number, which was then used to adjust for departures from neutral atmospheric stability using the KEYPS profile estimation. Results indicate that possible difficulties in measuring vertical wind shear may skew extreme event estimates, but that other values are within the range calculated in previous studies for similar environments. These results can assist environmental modelers in determining vulnerability to drought impacts under a variety of conditions.

3:00 pm – 3:30 pm
Session Break

Session T4
3:30 pm – 5:00 pm

Census Changes and Issues for Applied Geography [Retail Power Day]

Room: *Spicewood*

Chair: Linda Peters, *ESRI, Inc.*

Panelists:

Linda Peters, *ESRI, Inc.*

Raydele Klostermeier, *J C Penny*

Joan Naymark, *Target*

Lynn Wombold, *ESRI, Inc.*

Ethnical Issues in Applied Geography [Retail Power Day]

Room: *Cap Rock*

Chair: David Daleiden, *Daleiden & Associates*

Panelists:

David Daleiden, *Daleiden & Associates*

Larry Carlson, *Carlson & Associates*

John H. Haake, *J. H. Haake Market Research*

Tom Dwyer, *Dutch Hill Consulting*

Applied Geography is a powerful resource for the retail and real estate industry. Credible geographic analytical work can make the difference between success and failure for retailers and developers alike. Millions of dollars are involved in location decisions that are permanent in nature and are investments that last for decades. With this power, the geographer is faced with ethical concerns on many occasions. The geographic analytical work is all too often, a dynamic that can be abused to sway multi-million dollar decisions. As a professional, the applied geographer's future depends on the credibility and honesty of his evaluation. Attention paid to the ethnics of our profession is critical to the future of geographers in business. Nothing exposes the business geography profession to vulnerability more than unethical analysis and conduct.

This panel will attempt to identify what is meant by ethics in applied geography – how ethnics in geographic research can be compromised and the damaging results – and how the field of geography is perceived when unethical behavior is exhibited. We will also indicate methods to circumvent ethical pitfalls through real world examples from our experienced panel of professionals. We hope illicit reactions and have opinions discussed by all attending.

Remote Sensing 2

Room: *Llano*

Chair: Michael C. Slattery, *Texas Christian University*

USING NOAA'S HYSPLIT (HYBRID SINGLE-PARTICLE LAGRANGIAN INTEGRATED TRAJECTORY) MODEL TO PREDICT MERCURY DEPOSITION FROM COAL-FIRED POWER PLANTS IN TEXAS

Michael C. Slattery, *Texas Christian University*

This paper focuses on the atmospheric deposition of mercury (Hg) and its impact on aquatic ecosystems. First, a brief overview of studies of Hg in

the environment and contamination of fishes in Texas reservoirs is given, and shows that there should be concern over current Hg levels in fish in Texas water bodies. Atmospheric modeling is then used to show that deposition of Hg from coal-fired Electricity Generating Units (EGUs), widely recognized as the largest single anthropogenic source of environmental Hg, is of widespread regional significance, even in areas where non-US sources are assumed to dominate. The dominant transport direction of the wind over Texas, coupled with the location of most of the EGUs, contributes to widespread deposition of Hg in the region, and will continue to do so if Hg emissions are not adequately controlled.

SPATIAL APPLICATION OF WEPS FOR ESTIMATING WIND EROSION IN THE PACIFIC NORTHWEST

Jincheng Gao, *Kansas State University*; Larry Wagner, *USDA-ARS*; Fred Fox, *USDA-ARS*; Serena Chung, *Washington State University*

A REMOTE SENSING ANALYSIS OF FINGER LAKES REGION VINEYARDS

Adam James Mathews, *Texas State University-San Marcos*

The use of geographic techniques like remote sensing in identifying, and inventorying and assessing agriculture is becoming more and more important to farmers and land-owners around the globe. The Finger Lakes Region of New York State is well-known for its grape cultivation and the production of fine wines. This study uses the spectral characteristics of the vineyard areas in New York State using 2-foot resolution aerial imagery to differentiate them from surrounding land uses via band calculations, layer stacking, and supervised classification. Consequently, where vineyards are found they can be inventoried and their characteristics summarized. This study also addresses temporal change in the grape crop via Landsat 30-meter resolution satellite imagery and ground-based photographs. The Normalized Difference Vegetation Index (NDVI) is used to monitor leaf-area changes in the vineyard to coincide (ground-truth) with the photographs taken in the field.

MAPPING SALT AND SODIUM-AFFECTED SOILS IN THE SENEGAL RIVER DELTA USING LANDSAT TM DATA: A COMPARISON OF UNSUPERVISED AND SUPERVISED APPROACHES

Ramatoulaye Ndiaye, and John Harrington, Jr., *Kansas State University*

Soil salinization is an increasing problem in the deltaic region of the Senegal River in West Africa. Flows within the river fluctuate seasonally in response to warm season precipitation in the headwater area. Late 20th Century human modifications (e.g., dams to help control flooding and

diversions to improve year-round water supply) have been linked to an increase in sodic soils in the delta region.

Efforts to mediate the salinization problem will benefit from accurate maps of where salt and sodium-affected soils are located. Since field work in support of supervised classification involves a time and dollar investment, this study compares supervised and unsupervised approaches to classify Landsat TM data from the dry season of 2001 and 2003. Results document an expanding salinization problem and the importance of field data collection in support of detailed analysis and mapping of digital satellite data for land resource management.

Hazard 3: Perception and Impacts

Organizers: Burrell Montz, *East Carolina University* and Graham A. Tobin, *University of South Florida*

Chair: Graham A. Tobin, *University of South Florida*

NATURAL HAZARD PERCEPTION AMONG TEXAS HILL COUNTRY VITICULTURALISTS

Christic G. Townsend, *Texas State University-San Marcos*

The State of Texas is the fifth largest wine producing state in the United States. The wine economy in Texas is largely dependent on the success of crops grown in the Texas Hill Country viticultural region, which is, territorially, the largest appellation in Texas and the second largest in the United States.

Multiple natural hazards have the potential to impact grape production in the Texas Hill Country. Occasionally one or a combination of natural hazards, including disease, hail, frost, drought, and flooding, has been responsible for the loss of entire vintages. Here I present research findings on how grape growers perceive and prepare for natural hazards in their vineyard operations, based on interviews with eighteen vineyard operators in the Texas Hill Country. Interview information combined with an examination of local climate data provides a broad geographic picture of natural hazard perception and preparedness among viticulturalists in the Texas Hill Country.

HURRICANE AND TORNADO HAZARD COMPETENCY IN ALABAMA

Jason C. Senkbeil, *and* Diane Schneider, *University of Alabama*

The state of Alabama experiences a variety of severe weather events in all seasons. While most Alabamians have experienced or been impacted by hurricanes, tornadoes, or both, this experience may not necessarily translate into accurate hurricane and tornado hazard competency. In this

research, questions about general hurricane and tornado characteristics, frequency, and hazards were administered through surveys conducted on University of Alabama students and a small population of Monroeville, AL residents. The results of both surveys suggest that student and public weather hazard competency is below average to average on a number of issues. TV meteorologists should adjust broadcasting styles and switch emphasis to a more hazard oriented and less technical theme. Emergency managers should rethink communication strategies and work to develop new messages, graphics, and methods to facilitate better warning communication and explanation.

FLASH FLOODS, LOW WATER CROSSINGS, AND SWIFT WATER RESCUES IN TEXAS

Pamela S. Showalter, and Yongmei Lu, *Texas State University-San Marcos*

Flash floods occur across the nation, but more flash flood-related fatalities have occurred in Texas than any other state. Climatic and topographic factors intersect across the middle of Texas creating a swath of counties recently nicknamed, “Flash Flood Alley”. But physical factors, alone, are not responsible for all the deaths. Unfortunately, many fatalities take place when people voluntarily attempt to drive across flooded low water crossings (LWCs). Until now, no statewide Geographic Information System (GIS) combining LWC locations with Swift Water Rescue data has existed, hindering spatial analysis of their relationships. This paper describes the initial attempt to create such a GIS, incorporating data from a single year – 2007 – during which 46 flash flood deaths (~53% of all such fatalities) occurred in Texas. Numerous problems were encountered trying to locate and format the data, but eventually 675 of the 767 SWRs recorded that year (88%) were successfully mapped.

PREVIOUS EXPERIENCE AND PREPAREDNESS DURING THE 2008 SUPER TUESDAY TORNADO DISASTER AT MACON COUNTY, TN

Phil Chaney, and Greg S. Weaver, *Auburn University*

This paper evaluates the preparedness and response of local residents who had previous experience with being in a tornado disaster. The study site is Macon County, Tennessee, which was hit by an EF3 tornado on 5 February 2008. The tornado’s path across the county was approximately 10 miles long and 800 yards wide. Thirteen deaths were reported in the county. One hundred and twenty-seven local residents participated in a post-disaster survey that was conducted within days of the disaster. Thirty-seven of the survey participants (29%) indicated that they had previous

experience. For those with previous experience, 57% did not have an emergency response plan for seeking shelter, 95% did not own an emergency weather radio, and 49% lived in a mobile home. Although 42% rated their perception of danger as high when they became aware of the tornado warning, 30% indicated that they did not believe they were in any danger.

Forest/Biogeography

Room: *Driftwood*

Chair: Richard Earl, *Texas State University-San Marcos*

GEOGRAPHIC INFORMATION SYSTEMS TO JUSTIFY CONSERVATION OF BIODIVERSITY IN COSTA RICA: METHODS OF APPROPRIATE MEASURES FOR TROPICAL CONSERVATION APPLICATIONS

Kim Ozenick, and Michael C. Slattery, *Texas Christian University*

Costa Rica has long been known as one of the pioneers in conservation. The implementation of the Payments for Ecosystem Service (PES) program in the late 1990's has been largely successful in fulfilling the country's conservation initiative, but error still arises when quantify and valuing the actual worth of ecosystems. The study focused on evaluating whether Geographic Information Systems (GIS) could prove to be an efficient tool in quantifying and evaluating biodiversity in a forest with three succession stages (primary, secondary, and unknown). While common statistical analysis did not display significance in different between biodiversity and forest structure of the 3 sites, GIS was used to examine the spatial relationships within the 3 sites. When considering succession stages, it was found that spatial analysis yielded a more holistic view of the area than traditional statistical analysis techniques. This paper discusses the methods used in mapping and spatially analyzing multiple forestry and botanical data to assess overall diversity. This assessment will ultimately aid in determine and actual monetary worth to better conservation management and policy formation in the tropics.

GRASSLAND FRAGMENTATION EFFECTS ON BURROWING OWL PRODUCTIVITY

Monique De Vries, *New Mexico State University*

Western burrowing owl (*Athene cunicularia*) population declines are primarily linked to habitat fragmentation. To study how habitat fragmentation affects sensitive species, a comparison was made between burrowing owl productivity and grassland fragmentation on the Pawnee National Grassland. Thirteen prairie dog colonies were systematically

searched for burrowing owl nests and nest productivity was monitored from May to August of 2009. Aerial photographs of the area were classified and analyzed for landscape characteristics at both 600 meters and 3 kilometers around randomly selected nest sites. Landscape metrics, such as Edge Density, Variability of Patch Size, Interspersion/Juxtaposition Index, Mean Patch Size, Mean Shape Index, and Fractal Dimension, as well as vegetation composition, were used to explore burrowing owl productivity. Grassland fragmentation and burrowing owl productivity were not strongly correlated when comparing percentage of land cover. Landscape metrics did not clearly explain productivity difference between colonies.

HOW CULTURAL AWARENESS AND INGENUITY BENEFITS FOREST STEWARDSHIP COUNCIL CERTIFICATION IN THE DEVELOPING WORLD: CASE STUDY IN ZIMBABWE, AFRICA

Maria Grace Fadiman, *Florida Atlantic University*

The movement among consumers to purchase items that are certified for social integrity and environmental sustainability is growing. Thus, it is becoming increasingly necessary for companies to earn ecocertification labels. This project analyzes an endeavor certified by the Forest Stewardship Council (FSC). Focusing on the social and environmental criteria, the research investigates a complete chain of production from trees to final products in Zimbabwe, Africa. Through understanding local cultures and ecosystems, the company has found creative methods to comply with certification standards. Examples for social integrity include: community ownership, payment in non-devaluing commodities, traditional and modern health maintenance, safety precautions and gender inclusion. In terms of the environment, this group practices: rotational felling, replanting and waste minimization through utilizing scrap wood and producing sawdust pellets. This study serves as model which companies can apply to their own production criteria in order to sustainably achieve and maintain ecocertification labeling.

WOOD RESOURCES OF THE EASTERN TEXAS HILL COUNTRY

Richard Earl, William G. Adams, and Ashley N. Naber, *Texas State University-San Marcos*

Rural landholders in the eastern Texas Hill Country are faced with the “spillover” effects of population growth in the Austin-San Antonio Corridor that increased over 30 percent between 1990 and 2010 and is expected to increase another 60 percent by 2050. More than 150 years of livestock overgrazing and fire suppression has led to massive increases in Ashe juniper, decreases in livestock carrying capacity, and reduced ground-

water recharge. The decrease in livestock carrying capacity has contributed to reduced profitability of ranching that has fueled land fractionalization for exurban ranchettes and loss of wildlife habitat. “Brush management” programs increase carrying capacity and recharge but are expensive for the landowner.

This paper analyzes the potential for selling woody vegetation for charcoal (mesquite), firewood (Oak), fence posts (juniper) and powerplant fuelwood (mesquite, oak, and juniper). Vegetation sampling at the 4,000 acre Texas State Freeman Ranch employing the point-centered quarter method and measurements of tree diameter, height, and mass provided resources per unit area for the three taxa. Using market prices provides a value of greater than \$1,000 per acre. When these values were extended to the 1.2 million acre “eastern Texas Hill Country” region, the annual supply is worth over \$1 billion and would sustain a 100 MW wood burning powerplant. Additional revenues would be provided by the additional $\frac{1}{4}$ to $\frac{1}{8}$ acre foot of useable water supply per acre and the nearly double livestock carrying capacity.

FRIDAY, October 22, 2010

Session F1

8:30 am – 10:00 am

Retail Research [Retail Power Day] (8:00 am – 10:00 am)

Room: *Spicewood*

Organizer: Murray Rice, *University of North Texas*

Chair: Murray Rice, *University of North Texas*

RETAIL DEVELOPMENT AND DOWNTOWN CHANGE: SHOPPING MALL IMPACTS ON PORT HURON, MICHIGAN

Amie Dickinson, *Advance Auto Parts*; Murray Rice, *University of North Texas*

Mall openings initiate a period of tremendous change in local and regional retail landscapes. What is not necessarily obvious in such situations is the particular types of retail and service activities that were most affected by new mall introduction. In small cities in particular, the introduction of a new regional mall can have important impacts.

To study these impacts, we focus on Port Huron, Michigan and the changes associated with the 1987 opening of Birchwood Mall. Our analysis specifies the details of the mall's 20-year impact on the local retail community using relative entropy and chi-square analyses.

Our study identifies the business types most affected by the new mall development, both in the area of the mall and in downtown Port Huron. The study results provide a profile of mall development impacts, and suggest several business types best suited to revitalization programs for downtowns facing new mall competition.

NATIONAL LEVEL ANALYSIS OF 50 MAJOR U.S. DOMESTIC RETAILERS

Lawrence Joseph, *Arizona State University*

The structure of retail competition is complex. Although regionalism is widely recognized as being an important factor affecting retail trade, few studies have focused on location patterns of competitors at the US national scale. This paper analyzes the domestic spatial patterns of retail

stores and competitors at the national scale to demonstrate what major domestic retailers have regional bias, as compared to their competitors. GIS tools such as spatial mean center, standard distance, and standard distance ellipse are used to analyze the locations of 50 major US retailers. Spearman's rank correlation coefficients are used to test whether the standard distance of the chains can be explained by factors such as chain age and the total number of stores in the chain. Analyzing national spatial patterns provides insight into which chains may seek growth or retrenchment strategies. This analysis can serve as a benchmark for future trends in US domestic retailing.

INNER CITY MARKET NICHE FOR WAL-MART STORES IN METROPOLITAN LOCATIONS

Brian Ceh, and Tony Hernandez, *Ryerson University*

Our study examines the impact of a Wal-Mart store on its surrounding retail environment in an inner city neighborhood of Toronto, Canada from 1994 to 2008. Wal-Mart inherited a Woolco store location in Toronto's Dufferin Mall in 1994 as part of its entry into the Canadian market. Though suburban and exurban Wal-Marts can adversely impact main street retailing, inner city Wal-Marts may have better outcomes. For example, they might help stabilize inner city neighborhoods, limit the extent of inner city "food deserts" and potentially act as a catalyst for redevelopment. Our study found that within a few years of Wal-Mart locating a store in Dufferin Mall that taxable property revenues more than tripled and mall vacancies decreased. The mall has been gentrified and upscale stores are now being attracted. These outcomes are highly relevant to the commercial districts of struggling inner city neighborhoods across North America.

A GENERAL MODEL OF MORTGAGE FAILURE TIPPING POINT WITH AN EXAMPLE FROM SOUTHERN CALIFORNIA, 2006-2007

Guoping Huang, *Harvard University*; Stephanie Yates Rauterkus, *University of Alabama at Birmingham*; Rihcard Peiser, *Harvard University*; Grant Thrall, *University of Florida*

One of the most important problems of the mortgage crisis and the 2008 economic collapse is the contagion impact of properties in foreclosure on other neighboring properties. Mortgage default often leads to property disinvestment, vacancy, and abandonment. While one foreclosed property within a neighborhood may not endanger neighboring properties, several homes in a neighborhood may tip the scales whereby a vicious cycle of disinvestment and

deterioration begins. The present paper investigates whether or not this vicious cycle is manifest where mortgage failures multiply, and if so, to determine if there is a point at which the downward cycle accelerates – in other words, is there a tipping point related to mortgage default?

We investigate the impact that mortgage default has on properties in the same zipcode and neighboring zipcodes using data for the Los Angeles metropolitan area for the period 2003-2008. We hypothesize that neighborhoods' susceptibility to cascade failure can be measured by the rate of acceleration of mortgage failures within the neighborhood. First we present a model of change and the rate of change of mortgage failure for a small geographic area. Second, we present a model of change and the rate of change of mortgage failure for a surrounding geographic area. Third, we examine the different socio-economic compositions of different neighborhoods on the resiliency or susceptibility to mortgage failure. Finally, we interpret how the implications of our model can guide private investment decisions and public policy analysis.

RETAIL LOCATION AND RESIDENTIAL GENTRIFICATION

John H. Haake, *J. H. Haake Market Research*

Residential gentrification refers to the revitalization of the housing stock of previously neglected, low-cost housing in urban neighborhoods. Neighborhoods experiencing gentrification exhibit changing demographics characteristics and an increasing demand for retail goods and services. This paper develops a methodology for defining and analyzing the residential gentrification process in the US and its implications for retailing. A generalized model that defines and identifies the developmental stages and spatial pattern of gentrification is discussed. The demographic characteristics and retail location opportunities for each of the stages of gentrification are also examined. Finally, the methodology is illustrated by applying it to a specific metropolitan area.

Development and Sustainability

Room: *Cap Rock*

Chair: Lisa M. B. Harrington, *Kansas State University*

GREENING SMALL BUSINESS IN SPOKANE, WA: A CASE STUDY IN UNIVERSITY-COMMUNITY ENGAGEMENT IN SUSTAINABILITY

William J. Kelley, *Eastern Washington University*

Several cities in the U.S. have recently developed programs to encourage and recognize “green business practice” among their commercial and industrial sectors. Typically, the programs focus on business practices that reduce energy, waste, and pollution along with encouraging alternative travel modes. This case examines such an initiative in Spokane, WA and the collaborative partnership the program has with a research and service center at Eastern Washington University.

The case describes assessment and recognition approaches, business receptivity, benefits and levels of effort in service learning, and ongoing challenges in measuring long term sustainability outcomes. The case also explores the role “trust” plays in the interaction of participants.

SUSTAINABLE DEVELOPMENT: THE OPPORTUNITIES AND CHALLENGES IN REBUILDING TORNADO-IMPACTED GREENSBURG, KS AS "STRONGER, BETTER, AND GREENER"

Bimal K. Paul, *Kansas State University*

After an EF-5 tornado destroyed 95% of aging, declining Greensburg, Kansas on May 4, 2007, the city officials took the opportunity to rebuild this community by encouraging alternative practices and recommending energy-efficiency housing in a new Sustainable Comprehensive Plan. Using information collected from both primary and secondary sources for nearly three years, this paper outlines the lessons learned in Greensburg regarding the necessary processes that must take place in order to rebuild in a sustainable way. Specifically, it provides valuable insights regarding the opportunities and challenges Greensburg city officials have been confronting in rebuilding this community as “stronger, better, and greener.” Whether or not impacted by an extreme natural event, these lessons will provide helpful guide for small communities looking to be sustainable in some form or another.

LOCAL LAND USE DEVELOPMENT AGREEMENTS IN CALIFORNIA

Betty Elaine Smith, *Eastern Illinois University*

A California development agreement is a negotiated contract between a city or county and developer applicant that assures for a specified time period the developer’s land use entitlements in exchange for various city or county benefits provided by the developer. Over the years, city and county governments met with mixed degrees of success for a number of reasons including 1) level of sophistication in the use of development agreements, 2) value of local resources and markets (housing, commercial, and industrial), 3) regional economic conditions, 4) local growth philosophy,

and 5) financial stability of involved parties. This paper summarizes responses to mailed surveys and interprets on-site interviews to conclude whether or not the agreements worked as they were intended.

DECISIONMAKERS' VIEWS OF SUSTAINABILITY IN RURAL COASTAL WASHINGTON AND OREGON

Lisa M. B. Harrington, *Kansas State University*

Although sustainability and sustainable development often are used to describe planning and action goals, understanding of the meanings of these terms can be variable. In order to gain information about the understandings of key individuals in a rural region with a variety of key economic activities (timber production, fisheries, tourism, and agriculture), interviews were conducted in Clatsop County, Oregon, and Pacific County, Washington, in Fall 2008. These consisted of 10 key informant interviews with a variety of decision makers and information providers, including elected public representatives, public planners and administrators, and individuals strongly involved in resource-based enterprises. Concerns included both economic and environmental aspects of local to regional (and global) sustainability concerns; responses also reflected variable perceptions of local control (or power) over important aspects of change, and the clarity of the sustainability concept. Such concerns and perceptions should be considered as local decisions are made in regard to sustainability issues.

Tools for Research in Geography

Room: *Llano*

Chair: Yu Zhou, *Bowling Green State University*

ESTIMATION OF FARMLAND SOIL WIND EROSION MAKING USE OF GPS RTK MEASUREMENT AND ^{137}Cs TRACING TECHNIQUE

Chunlai Zhang, *Beijing Normal University*; Jiaqiong Zhang, *Beijing Normal University*

Serious wind erosion in northern China has been being a big environmental problem especially on cultivated soil. This paper estimated soil erosion rates during the past decades making use of differential GPS technology and ^{137}Cs tracing technique in Kangbao County, a representative area undergoing serious wind erosion both on farmland and on grassland in northern China. Banks that maintained between farmland plots when the original grassland had been cultivated into stripped farmland have experienced little erosion or deposition, so these banks offered a useful reference for GPS measurement to estimate soil loss by wind in adjacent

farmland plots. Differential GPS and real time kinematic (RTK) measurement shows that almost half centimeters surface soils have been blown away from farmland in this area since the soil had been cultivated in the early twentieth century. Average depth of soil loss by wind erosion in the measured two farmland sites is 0.54 cm per year ($88.34 \text{ t hm}^{-2} \text{ a}^{-1}$). Soil wind erosion rates derived from ^{137}Cs method present a very close result that the average wind erosion rate in 30 farmland plots is 0.55 cm per year ($89.53 \text{ t hm}^{-2} \text{ a}^{-1}$) since 1963. Intense wind erosion not only caused serious local land degradation, but makes this area an important source of blown sand and dusts that threaten downwind Beijing and Tianjin metropolitan area, China.

GEOGRAPHIC FIELDWORK: COMPARING GPS CAPABILITIES BETWEEN SMARTPHONES AND DEDICATED GPS

Anna Klimaszewski-Patterson, *New Mexico State University*

Since Apple iPhone's 2007 debut, the availability of GPS-enabled smartphones has grown. The effectiveness of GPS-enabled smartphones for basic geographic fieldwork has been unexplored. This article compares a GPS-enabled smartphone, the HTC G1 Dream (G1), against a dedicated GPS device, the Trimble Juno ST (Juno), with respect to ease-of-use and accuracy of GPS readings. Ease-of-use tests involved (1) locating polylines/boundaries, (2) recording polylines/tracks, (3) recording points/waypoints, and (4) navigating to specific geographic coordinates. GPS accuracy tests were done at previously recorded survey markers. In ease-of-use tests, G1 applications proved much simpler for test subjects to operate and extract data from than Juno applications. Regarding GPS accuracy, G1 exhibited lower residual error, and thus more truthfulness, in its reported accuracy. Both devices had an actual accuracy range between 1-6 meters. G1 demonstrated that a GPS-enabled smartphone can be a viable alternative for geographic fieldwork where enterprise-level software is not needed.

A TECHNIQUE FOR CREATING ANIMATED MAPS OF URBANIZED AREAS USING LANDSAT IMAGERY

Charles Roberts, *Florida Atlantic University*, J. L. Delahunty, *Texas Tech University*, and Gillian Breary, *Florida Atlantic University*

USING CLICKERS IN LARGE GEOGRAPHY CLASSROOM: PRACTICE, PROMISES, AND PROBLEMS

Yu Zhou, *Bowling Green State University*

A clicker, or classroom response system (CRS), is an electronic device to poll an audience and get immediate feedback to questions posed by presenters. Because of its ability to collect audience responses in real-time, the use of clicker is growing quickly in large lecture rooms of many higher education institutions. To test the effectiveness of clickers in a large geography class, the author used the technology in Weather and Climate, a selective general natural science required course at Bowling Green State University, in both Fall 2009 and Spring 2010 semesters. The experience indicates that while clickers are very effective in managing large-size classes, understanding students by gathering valuable information, and engaging students in active learning, there are still many problems need to be solved to utilize its full potentials in large classroom teaching.

Geography and HIV/AIDS

Room: *Pheasant Ridge*

Chair: Joseph R. Oppong, *University of North Texas*

FIGHTING HIV/AIDS IN WEST AFRICA - IS THERE ROOM FOR GEOGRAPHERS?

Joseph R. Oppong, *University of North Texas*

Compared to Southern Africa, HIV/AIDS is less severe in West Africa. Yet this generalization conceals important spatial differences in severity, dynamics and drivers of the very serious epidemic facing West African countries. Understanding the spatial patterns and the associated drivers including globalization pressures, gender imbalance and the impact of economic changes is critical for effective control of HIV/AIDS.

This paper examines and attempts to explain the changing spatial patterns of HIV/AIDS in West Africa (Benin, Burkina Faso, Côte d'Ivoire, Cape Verde, Gambia, Ghana, Guinea, Guinea Bissau, Liberia, Mali, Niger, Nigeria, Senegal, Sierra Leone and Togo). Focusing on gender, religion, economic, political and other influences, it argues that place specific interventions are critically needed in the effort to control HIV/AIDS. Consequently, geographers have a crucial role to play in the fight against HIV/AIDS.

HIV/AIDS LATE TESTERS IN TEXAS

Jody S. Huddleston, and Joseph R. Oppong, *University of North Texas*

HIV positive people who are unaware of their status are unable to take advantage of current treatments, may continue to participate in high-risk behaviors, and are thus more likely to transmit the disease. Consequently, early diagnosis is critical for both the health of the individual and the prevention of further spread. This study examines the geography and

neighborhood characteristics of HIV/AIDS late testers in Texas. Zip code level HIV/AIDS data from Texas DSHS was analyzed using statistical and spatial analytic tools. After examining Texas as a whole, Dallas and Harris Counties are examined as case studies. In general zip codes with high rates of late testers have high percentages of unmarried couples, low median incomes, and are more likely to be occupied by minority populations. Knowing the spatial distribution and neighborhood characteristics of areas with high late tester rates may allow for more effective targeting of prevention and control efforts.

NEIGHBORHOOD CHARACTERISTICS AND HIV/AIDS IN TEXAS

Joseph R. Oppong, and Chetan Tiwari, *University of North Texas*

This study examines the pattern of HIV/AIDS cases diagnosed in Texas at the zip code level from 1999-2008. It interrogates the neighborhood characteristics associated with the areas with high rates. The results confirm that neighborhood characteristics such as race-ethnic makeup, socioeconomic characteristics, crime rates, school dropout rates, recreation facilities and other indicators of neighborhood health are important determinants. Moreover, mode of exposure to HIV varies significantly between and within neighborhoods. The research explores these using WebDMap and statistical analysis. It concludes that neighborhood specific interventions are needed to tackle America's multiple HIV/AIDS epidemics in the South.

THE IMPACT OF TEXAS DEPARTMENT OF CRIMINAL JUSTICE PRISON FACILITIES ON THE HIV/AIDS RATES OF THE GENERAL COMMUNITY IN TEXAS COUNTIES

Libbey C. Kutch, Joseph R. Oppong, and Chetan Tiwari, *University of North Texas*

Previous research suggests that prisons may be fueling HIV/AIDS spread in the general population. Thus the location of prisons and characteristics of the surrounding communities may influence the geography of HIV/AIDS.

This paper investigates the relationship between the spatial distribution of HIV/AIDS and the location and size of Texas Department of Criminal Justice (TDCJ) prison facilities in Texas communities. It addresses two major questions: 1. does the location of prison facilities affect the HIV/AIDS rate of non-incarcerated residents? 2. is there evidence to suggest that the prison system is fueling the spread of HIV/AIDS in the general population? In other words, is living within communities closest to prison units a risk marker for HIV/AIDS?

This study suggests that populations living in close proximity to prisons are more vulnerable to coming in contact with HIV/AIDS, and therefore more likely to contract the disease.

MODELING PLACE VULNERABILITY

Adam Harold, *University of North Texas*

Much research has been done on studying and identifying vulnerable people and populations with respect to disease, including HIV/AIDS. However little has been done to identify 'vulnerable places' with respect to these diseases, including HIV/AIDS, beyond a model that mirrors the composition of a population. While individual risk factors such as behaviors are crucial in understanding HIV/AIDS, the outcome of certain risky behaviors can vary by place. This makes the study and identification of vulnerable places necessary. The objective of this study conceptualizes and operationalizes a model for place vulnerability. This study shows that areas within the state of Texas vary with respect to HIV/AIDS, and that these differences are in part due to neighborhood characteristics. The main outcome of this study is the use of the methodology in order to target vulnerable places, and identify those factors that contribute to making an area vulnerable to HIV/AIDS.

River, Aquifer, and Seawater

Room: *Driftwood*

Chair: Robert D. Larsen, *Texas State University-San Marcos*

TEXAS FRESHWATER INFLOWS

Shae R. Luther, and Laura J. Stroup, *Texas State University-San Marcos*

MODELING KUWAIT SEAWATER CLARITY: A SPATIAL-TEMPORAL STUDY USING REMOTE SENSING AND GIS

Mohammad M. M. Alsahli, *Kuwait University and University of Kansas*; Kevin P. Price, *University of Kansas*; Robert Buddemeier, *Kuwait University and University of Kansas*; Daphne G. Fautin, *Kuwait University and University of Kansas*; Stephen Egbert, *Kuwait University and University of Kansas*

A FEASIBILITY STUDY OF THE DESALINATION OF BRACKISH EDWARDS AQUIFER WATER IN CENTRAL TEX POWERED BY REFUSE DERIVED FUELS AND RECOVERED LANDFILL GAS

Robert D. Larsen, *Texas State University-San Marcos*

10:00 am – 10:30 am

Session Break

10:30 am – 12:00 pm

Session F2

Retail Business Education

Room: *Spicewood*

Organizer and Chair: Eugene Tettey-Fio, Binghamton University

Panelists:

Brett Bayduss, *Site Selection Group*

Tom Dwyer, *Dutch Hill Consulting, Inc.*

Lawrence Estaville, *Texas State University-San Marcos*

Matt Panfel, *International Council for Shopping Centers*

Matt Ryner, *Rockland County Planning*

Eugene Tettey-Fio, *Binghamton University*

Wastes, Scrap and Recycling Issues

Room: Cap Rock

Organizer and Chair: Donald I. Lyons, *University of North Texas*

RECYLING STEEL, HIDDEN FLOWS AND THE INTERNATIONAL TRADE OF
SCRAP IRON AND STEEL

Amanda Caldwell, *University of North Texas*

RECYLING EFFICIENCY AND NEIGHBORHOOD AFFECTS: A CASE STUDY OF
THE CITY OF FORTH WORTH'S RECYCLING PROGRAM

Robert Wachal, *University of North Texas*

LAND USE LAND COVER AND TRACE METAL RUNOFF FROM CHICKEN
LITTER APPLICATION

Jessica E. Pack, Shea Tuberty, and Christopher A. Badurek, *Appalachian
State University*

CIRCUITS OF SCRAP: CLOSED LOOP INDUSTRIAL ECOSYSTEMS AND THE GEOGRAPHY OF U.S. INTERNATIONAL RECYCLABLE MATERIALS FLOWS, 1995-2009

Donald I. Lyons, *University of North Texas*

Emerging Innovations in GeoInformatics

Room: *Llano*

Organizer and Chair: James K. Lein, *Ohio University*

APPLYING 3D MODELING AND GEOSPATIAL TECHNOLOGY TO UNIVERSITY CAMPUS VISUALIZATIONS

Bradley A. Shellito, *Youngstown State University*,

END-TO-END WORKING PROTOTYPES FOR STANDARDIZED OPERATIONAL ENVIRONMENTAL GEOGRAPHIC INFORMATION NETWORKS: EXAMPLES FROM THE GREAT LAKES AND ARCTIC FOR INVASIVE SPECIES AND CLIMATE MONITORING

Richard A. Beck, *University of Cincinnati*; James K. Lein, *Ohio University*; Robert C. Frohn, K. Hinkel, W. Wisner, B. Jones, C. Arp, C. Lambert, D. Miller, K. Kreigel, *Ohio University*

A CRITICAL COMPARISON OF CONCEPTUAL AND MEASUREMENT MODELS OF URBAN FORESTS

Mike Battaglia, *Ohio University*; Gaurav Sinha, *Ohio University*

SPATIAL MULTICRITERIA DECISION ANALYSIS: PRESCRIPTIVE MODELING FOR SUSTAINABLE DEVELOPMENT

Walter Kropp, *Ohio University*; James Lein, *Ohio University*

Medical Geography

Room: Pheasant Ridge

Chair: Chetan Tiwari, *University of North Texas*

A METHOD FOR PRODUCING DISEASE MAPS WITH HIGH LEVELS OF GEOGRAPHIC DETAIL

Chetan Tiwari, *University of North Texas*

A SPATIO-TEMPORAL ANALYSIS OF LASSA FEVER AND CEREBRAL SPINAL
MENINGITIS IN WEST AFRICA

Richard Ohwofasah Djukpen, *University of Illinois, Urbana-Champaign*

DENTON DRUG DISPOSAL DAY

George Maxey, Duane B. Huggett, and Kati Stoddard, *University of North Texas*

HIERARCHICAL ORDERS OF TRIBAL HEALTH SERVICE CENTRES IN
DHADGAON TAHSIL OF NANDURBAR DISTRICT (M.S.)

Dynaneshwar Shivaji Suryawanshi, *VWS College, Dhule*

Water and Watersheds

Room: *Driftwood*

Chair: Feifei Pan, *University of North Texas*

SUSTAINABILITY OF THE CARRIZO-WILCOX AQUIFER IN CENTRAL TEXAS
USING INDICATORS

Dana Denice Squires, *Texas State University-San Marcos*

GEODATABASES OF BASIN CHARACTERISTICS FOR WATERSHEDS
THROUGHOUT TEXAS, 2010

Sophia Gonzales, *US Geological Survey*

USING GIS TO DELINEATE SEWER BASINS TO THE HIGHEST LEVEL OF
DETAIL

Jennifer Moore, *Freese and Nichols, Inc.*

THE EFFECT OF THE UNCERTAINTIES IN SOIL HYDRAULIC FUNCTIONS
AND PARAMETERS ON SOIL MOISTURE PREDICTIONS

Feifei Pan, *University of North Texas*

12:00 pm – 1:30 pm

LUNCHEON

Room: *Brushy Creek & Dry Comal Creek*

Keynote Speaker: Andy Taft, President, Downtown Fort Worth, Inc.

**DOWNTOWN FORT WORTH: THE GEOGRAPHY OF
SOMEWHERE – HOW THE PUBLIC AND PRIVATE SECTORS CAME
TOGETHER TO RENEW A CITY CENTER**

1:30 pm – 3:00 pm

Session F3

**Geographic Areas for the 2010 Census and the American
Community Survey**

Panelists:

Michael Ratcliffe, *Division of Geography, US Census Bureau*

Vincent Osier, *Division of Geography, US Census Bureau*

April Avnayim, *Division of Geography, US Census Bureau*

Urban Geography

Room: *Cap Rock*

Chair: Christopher A. Badurek, *Appalachian State University*

DIVERGENT SENIOR HOUSING IN AUSTIN, TEXAS

Kevin Romig, Kathleen Seal, and Virginia Shewmake, *Texas State
University-San Marcos*

HEADING EAST: REDEFINING GROWTH FORCES IN THE I-35 CORRIDOR

James Vaughan, *Texas State University-San Marcos*

**STILL LEFT BEHIND: ESTIMATING THE UNINSURED POPULATION IN
TEXAS**

Michael E. Cline, *Rice University*

**RELATION OF HOUSING DENSITY GROWTH TO LAND USE AND LAND
COVER CHANGE ALONG THE S. FORK NEW RIVER**

Christopher A. Badurek, *Appalachian State University*

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Chair: Wei Song, University of Louisville

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Bradley Cullen, *University of New Mexico*

3:00 pm – 3:30 pm
Session Break

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Census Research

Room: *Spicewood*

Organizer and Chair: Michael Ratcliffe, *Geography Division, US Census Bureau*

ZIP CODE TABULATION AREAS FOR 2010 AND BEYOND

Vincent Osier, *Geography Division, US Census Bureau*

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USING AMERICAN COMMUNITY SURVEY (ACS) DATA IN GEOGRAPHICAL RESEARCH

Min Sun, and David Wong, *George Mason University*

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Michael Ratcliffe, *Geography Division, US Census Bureau*

Urban-Rural Interface

Room: *Cap Rock*

Chair: Michael J. Starr, *Southern Illinois University, Edwardsville*

THE IMPACT OF GENTRIFICATION ON URBAN DEVELOPMENT

Mohammad Hadi Kaboli, *Universite de Strasbourg*; Leila Zare, *Islamic Azad University*

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Room: *Llano*

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A COUNTY-LEVEL ANALYSIS OF GROWTH SHARE, 1998-2007

Rajiv Thakur, *University of South Alabama*; Jay Gatrell, *Indiana State University*

Place and Ethnicity

Room: *Pheasant Ridge*

Chair: Stephen R. Butcher, American Military University

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Nick Cuba, *Clark University*

ADMINISTRATIVE CARRYING CAPACITY OF MUNICIPALITIES IN A
TRANSPORTATION CORRIDOR IN CHIAPAS, MEXICO FOLLOWING
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Eric L. Samson, *Texas State University-San Marcos*

ANALYSING THE RELATIONSHIP BETWEEN RESIDENTIAL SEGREGATION
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Kerstin Hermes, *Macquarie University, Australia*

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Aron Massey, *Kent State University*; Stephen R. Butcher, *American
Military University*

Water Resources

Room: Driftwood

Chair: Paul Hudak, *University of North Texas*

USING MULTIVARIATE AND SPATIAL STATISTICAL TECHNIQUES IN
UNDERSTANDING THE GROUNDWATER QUALITY OF THE TRINITY
AQUIFER

Jennifer M. Holland, *University of North Texas*

HISTORICAL TRANSFORMATION OF URBANIZED WATERSHEDS BY
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Martin M. Kaufman, *University of Michigan-Flint*; Kent S. Murray,
University of Michigan-Dearborn; Daniel T. Rogers, *Amsted, Inc.*

ESTIMATING INUNDATION PATTERNS IN DETENTION WETLANDS:
METHODOLOGY AND APPLICATION TO NORTH-CENTRAL TEXAS

Paul Hudak, and Nicholas Enwright, *University of North Texas*

8:00 am – 12:00 pm

Poster Session

Room: *Driftwood Hall way*

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USING GIS TO EVALUATE PRECIPITATION CHARACTERISTICS OF THE
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Laura Michelle Radford, *University of Alabama*

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Stacy Brooks, *University of Louisville*

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CDT Rhys A. Hearn and Peter Guth, *U.S. Military Academy*

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INCREASING NUMBERS OF FORECLOSED HOMES HAVE AFFECTED CRIME
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Tyler F. Kerr, *University of Louisville*

5:30 pm – 6:00 pm

Pre-Field Trip Briefing

Room: *La Bodega Boardroom*

6:30 pm – 7:30 pm

Board of Directors Meeting

Room: *Llano & Pheasant Ridge*

SATURDAY, October 23, 2010

8:00 am – 2:00 pm

Field Trip

Organizer and Leader:

Murray Rice, *University of North Texas*

Jeff Roet, *Texas Christian University*

Gather at Hotel Lobby @ 8:00 am

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