



The 35th Annual
Applied Geography Conference

October 10-12, 2012

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Conference Location

Holiday Inn

Minneapolis-Metrodome

1500 Washington Ave. South

Minneapolis, MN 55454

(877) 834-3613

Conference website:

<http://applied.geog.kent.edu>

2012 *Applied Geography Conferences*

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Rod Squires, *University of Minnesota*, squires@umn.edu

2012 *Applied Geography Conferences*

CONFERENCE PROGRAM AT A GLANCE

Wednesday, 10/10/2012

Session W1, 6:00 pm – 7:30 pm

Rethinking Applied Geography: An Open Forum, Room CD

Session W2, 8:00 pm – 9:30 pm

Opening Reception, Room CD

Thursday, 10/11/2012

Session T1, 8:30 am – 10:00 am

Geography Education 1, Room A

Urban Geography 1: Housing and Segregation, Room B

Business Geography Curriculum, Room CD

Hazards 1: Weather Events, Room E

GIS & Cartography 1: Data, Room F

Session T2, 10:30 am – 12:00 noon

Sustainability and Natural Resources, Room A

Urban Geography 2: Migration and Ethnicity, Room B

Issues in Business Geography, Room CD

Geography of Health 1, Room E

Remote Sensing 1, Room F

Session T3, 1:30 pm – 3:00 pm

Agriculture and Water, Room A

What Distinguishes the Twin City? Room B

Retail Applications in Business Geography, Room CD

Ecosystem 1, Room E

Applied Climatology, Room F

Session T4, 3:30 pm – 5:00 pm

Sustainability Policies and Metrics, Room A

U-Spatial: Spatial Science at the University of Minnesota, Room B

Local Evidence of National Retail Trend, Room CD

Applied Physical Geography, Room E

Modeling with GIS and Remote Sensing, Room F

Evening Sessions

Retail/Business Geography Discussion Session, Room Avalon

Applied Geography, Editorial Board Meeting, Room A

Friday, 10/12/2012

Session F1, 8:30 am – 10:00 am

Geography Education 2, Room A

Urban Geography 3: Sprawl and Structure, Room B

Health and Business Geography, Avalon (3rd Floor)

Hazards 2: Floods, Room E

GIS & Cartography 2: Public Services, Room F

Session F2, 10:30 am – 12:00 noon

Socioeconomic Geography, Room A

Urban Geography 4: Environmental Management, Room B

The Business of Applied Professional Geographic Practice, Avalon (3rd Flr.)

Geography of Health 2, Room E

Remote Sensing 2, Room F

Luncheon, 12:00 Noon – 1:30 pm, Room CD

Session F3, 1:30 pm – 3:00 pm

Living in the Sustainable City? Room A

Transportation Geography, Room B

Ecosystem 2, Room E

Geographic Area Classification and Analysis of Census Bureau, Room F

Session F4, 3:30 pm – 5:00 pm

Social Issues, Room A

Professional Development of Applied Geographers, Room B

Technical Advances in Applied Geography, Room E

Geospatial Analysis, Room F

Evening Session

Applied Geography Conferences Board of Directors Meeting, Room
Avalon

WEDNESDAY, OCTOBER 10, 2012

REGISTRATION

3:30 pm – 7:00 pm

POSTER SETUP

5:00 pm – 7:00 pm

SESSION W1

6:00 pm – 7:45 pm

RETHINKING APPLIED GEOGRAPHY – AN OPEN FORUM

Room CD

Moderator: Jay Lee, *Kent State University*

Panelists:

Don Albert, *Sam Houston State University*

Dawna Cerney, *Youngstown State University*

Michael DeMers, *New Mexico State University*

Tom Dwyer, *Dutchhill Consulting, Inc.*

Richard Earl, *Texas State University – San Marcos*

Jay Gatrell, *Indiana State University*

Rezaul Mahmood, *Western Kentucky University*

Joseph Kerski, *ESRI, Inc.*

Michael Ratcliffe, *US Census Bureau*

Murray Rice, *University of North Texas*

Richard Shaker, *Binghamton University*

Wei Song, *University of Louisville*

OPENING RECEPTION

8:00 pm – 9:30 pm

Room CD

Thursday, October 11, 2012

THURSDAY, OCTOBER 11, 2012

REGISTRATION

8:00 AM – 3:30 PM

POSTERS

8:30 AM – 3:30 PM

SESSION T1

8:30 am – 10:00 am

GEOGRAPHY EDUCATION 1

Room A

Chair: John Harrington, Jr., Kansas State University

ADVANCING GEOGRAPHIC LITERACY BY INCREASING GEOGRAPHY IN THE PRE-SERVICE SOCIAL STUDIES METHODS CLASSROOM

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

RETHINKING CLASSROOM SPACE: STUDENT HABITS, PREFERENCES AND PERFORMANCE

Sandy Ramage, Southern Illinois University, Edwardsville

DESIGNING CLICKER QUESTIONS TO PROMOTE HIGH-LEVEL GEOGRAPHIC LEARNING

Yu Zhou, Bowling Green State University

USING A TERRESTRIAL 3D LASER SCANNER AS A TOOL TO ENHANCE UNDERGRADUATE GEOGRAPHY CURRICULUM

Brandon Vogt, University of Colorado Colorado Springs

Thursday, October 11, 2012

URBAN GEOGRAPHY 1: HOUSING AND SEGREGATION

Room B

Chair: Wei Song, University of Louisville

LOW-INCOME HOUSING AND SOCIOECONOMIC CHANGE IN METROPOLITAN AMERICA

Rebecca J. Walter, Florida Atlantic University

Serge Atherwood, Pennsylvania State University

RELATIVE SOCIAL DISTANCE: AN ANALYSIS OF THE RESIDENTIAL SEGREGATION BETWEEN AFRICAN AMERICAN AND WEST INDIAN BLACKS

Jay L. Newberry, Binghamton University

SOCIAL AND SPATIAL SEGREGATION – AN EMPIRICAL STUDY OF MIGRANT POPULATION IN BEIJING, CHINA

Wei Song, University of Louisville

Baoxiu Zhang, Beijing Union University, Beijing, China

BUSINESS GEOGRAPHY CURRICULUM

Room: CD

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

Chair: Murray D. Rice, University of North Texas

Panelists:

Bill Black, Louisiana State University

William Graves, University of North Carolina – Charlotte

Tony Hernandez, Ryerson University

Fred Miller, Murray State University

Wes Stroh, Penn State University

Lawrence Joseph, Arizona State University

HAZARDS 1: WEATHER EVENTS

Room E

Chair: Kang Shou Lu, Towson University

THE UNFORGETTABLE SUMMER OF 2011: HEAT AND DROUGHT IN THE
SOUTHERN PLAINS

Kent M. McGregor, University of North Texas

APPLICATION OF THE TORNADO IMPACT – COMMUNITY VULNERABILITY (TICV)
INDEX TO THE 2011 TORNADO SEASON

Mitchel Stimers, Cloud County Community College

Bimal Paul, Kansas State University

REFINING THE SPATIAL PREDICTION OF EXPECTED PROBABILITY OF HURRICANE
LANDFALLS IN SOUTH CAROLINA

Shuang Wu and Kang Shou Lu, Towson University

EDUCATIONAL TRAINING OF STORM SPOTTERS AND CHASES IN RELATION TO
GEOGRAPHICAL DISPERSION ACROSS THE UNITED STATES

Paul Zunkel, Minnesota State University

GIS & CARTOGRAPHY 1: DATA

Room F

Chair: Xin Zhao, University of Redlands

GPS, GIS AND THE DIGITAL DIVIDE: GEOGRAPHY'S PLACE WITHIN SUB-
SAHARAN AFRICAN POVERTY STUDIES

Deborah Naybor, University of Buffalo

Thursday, October 11, 2012

THE QUALITY OF CONTINUOUS SURFACES DERIVED FROM POINT SAMPLED
DATA AND CARTOGRAPHIC GENERALIZATION

Peter P. Siska, U.S. Military Academy

I-Kuai Hung, Stephen F. Austin University

Vaughn M. Bryant, Texas A&M University

DATA AVAILABILITY AND TOBLER'S FIRST LAW OF GEOGRAPHY: AN
APPLICATION OF NEURAL NETWORKS TO SPATIAL RETAIL DATA

Xin Zhao, University of Redlands

SESSION BREAK

10:00 am – 10:30 am

SESSION T2

10:30 am – 12:00 pm

SUSTAINABILITY AND NATURAL RESOURCES

Room A

Chair: Chris Laingen, Eastern Illinois University

REAL ESTATE STRATEGIES FOR NATURAL RESOURCE PRESERVATION

Tom Dwyer, Dutch Hill Consulting, Inc.

FREI GODINHO AGRICULTURAL SETTLEMENT, PERNAMBUCO, BRAZIL: THE
SUSTAINABILITY OF A LIVING ALTERNATIVE TO SUGAR MONOCULTURE

William Maxell, University of New Mexico

SUSTAINABLE COMMUNITY DEVELOPMENT IN THE GREATER YELLOWSTONE
ECOSYSTEM: A CASE STUDY OF JACKSON, WYOMING

Thursday, October 11, 2012

Ryan D. Bergstrom and Lisa M. B. Harrington, Kansas State University

SUSTAINABLE DEVELOPMENT OF GROUNDWATER RESOURCES IN ENVIRONS OF
MADHURAWADA DOME, VISAKHAPATNAM DISTRICT, INDIA – A GEOSPATIAL
TECHNOLOGY APPROACH

Peddada Jagadeeswara Rao, Andra University, India

URBAN GEOGRAPHY 2: MIGRATION AND ETHNICITY

Room B

Chair: John W. Frazier, Binghamton University

THE FOREIGN-BORN BLACK IMMIGRANTS IN FRANKLIN COUNTY AND
COLUMBUS, OHIO, 1990-2012: SETTLEMENT PATTERNS AND SOCIOECONOMIC
STATUS

Eugene Tettey-Fio, Binghamton University

INFLUX OF ASIAN INDIANS LEADS TO RAPIDLY CHANGING QUEENS' LANDSCAPE
IN PAST DECADE THAT CONTINUES

Norah F. Henry and John W. Frazier, Binghamton University

MIGRATION, LANDSCAPE, AND TRIGGERS IN COMMUNITY TENSIONS:
PLANNING CLASHES IN BELLEROSE, QUEENS

John W. Frazier and Norah F. Henry, Binghamton University

MEGAPOLITAN CORRIDORS AS NEW IMMIGRANTION GATEWAYS: ENERGING
ASIAN ETHNOSCAPES IN THE U.S. SOUTHERN PLAINS

Aswin Subanthore, Oklahoma State University

ISSUES IN BUSINESS GEOGRAPHY

Room: CD

Thursday, October 11, 2012

Chair: William Graves, University of North Carolina, Charlotte

BREAKING THROUGH THE PROPRIETARY DATA WALL: TEACHING CHAIN-STORE SALES FORECASTING USING DATA FROM THE FIELD

Evan Byres and William Graves, University of North Carolina, Charlotte

CONSULTANTSHIPS – GOING BEYOND CONVENTIONAL INTERNSHIPS

Robert Larsen and James Vaughan, Texas State University – San Marcos

KNOWLEDGE AND INFLUENCE NETWORKS: DO BOARD MEMBERSHIP CHOICES CONTRIBUTE TO BUSINESS GROWTH AND DECLINE?

Murray D. Rice and Sean Tierney, University of North Texas

Sean O’Hagan, Nipissing University

Donald Lyons, University College Cork, Ireland

Milford B. Green, University of Western Ontario

GEOGRAPHY OF HEALTH 1

Room E

Chair: Jonathan C. Comer, Oklahoma State University

ANALYSIS OF FATALITY ACCIDENT DATA IN RURAL AREAS

Jonathan C. Comer, Leonard Bombom, and Nicholas J. Rose, Oklahoma State University

IMPROVING ACCURACY OF TRAFFIC POLLUTION ESTIMATES FOR HEALTH ANALYSIS USING COMMONLY AVAILABLE ROAD NETWORK AND CENSUS DATA

F. Underwood, N. Okonkwo, S. Bertazzon, and G. Kaplan, University of Calgary

WHAT ARE WE ‘TWEETING’ ABOUT OBESITY? AN EXPLORATION OF TOPIC MODELING AND SPATIAL ANALYSIS

Debarchana (Debs) Ghosh, University of Connecticut

Thursday, October 11, 2012

Rajarshi Guha, National Institute of Health

DETERMINANTS OF LUNG CANCER DISPARITIES FOR FEMALES AND MALES
ACROSS CENTRAL APPALACHIA

Timothy S. Hare, Chad Wells, and Nicole Johnson, Morehead State University

REMOTE SENSING 1

Room F

Chair: James K. Lein, Ohio University

ASSESSMENT OF THE DAYTIME AND NIGHTTIME THERMAL INFRARED DATA FOR
URBAN MAPPING IN THE ATLANTA METROPOLITAN AREA

Paporn Thebpanya, Towson University

APPLICATION OF UAV IMAGERY FOR LAND COVER MAPPING AND TERRAIN
MODELING

Dion J. Wiseman, Terrence McGonigle, Pamela Rutherford, and Jurien van der
Sluijs, Brandon University

LAND COVER CLASSIFICATION USING AERIAL PHOTOGRAPHS AND LIDAR DATA
FOR POOL 5 OF THE MISSISSIPPI RIVER

Cynthia Berlin, University of Wisconsin-La Crosse

DERIVING MEASUREMENT ENDPOINTS USING MODERATE RESOLUTION
SENSORS: MEETING THE MONITORING CHALLENGE FOR ECOLOGICAL RISK
ASSESSMENT

James K. Lein, Ohio University

LUNCH BREAK

12:00 pm – 1:30 pm

Thursday, October 11, 2012

SESSION T3

1:30 pm – 3:00 pm

AGRICULTURE AND WATER

Room A

Chair: Lisa Harrington, Kansas State University

CLIMATIC VARIABILITY AND CHANGING TRENDS IN AGRICULTURE IN WEST
CENTRAL ALBERTA, CANADA

Catherine Hooey, Pittsburg State University

MAPPING THE NEW CORN BELT

Chris Laingen, Eastern Illinois University

VIRTUAL WATER AS A DRIVING FORCE FOR LAND CHANGE IN THE HIGH PLAINS
AFTER 1950

Stefanie Bohms, South Dakota State University

MAPPING WATER RESOURCES IN THE PRAIRIE POTHOLE REGION

Janet Gritzner and Bruce Millett, South Dakota State University

WHAT DISTINGUISHES THE TWIN CITIES?

Room B

Organizer and Chair: Todd Graham, Twin Cities Metropolitan Council

Panelists:

Steve Berg, freelance writer, retired from Minneapolis Star Tribune

Jon Commers, Council member at Metropolitan Council

Brenda Kayzar, University of Minnesota

Curt Johnson, President, CitiStates

RETAIL APPLICATIONS IN BUSINESS GEOGRAPHY

Room: Room CD

Chair: Tony Hernandez, Ryerson University

**SUBSTANCE VERSUS STYLE: WHAT IS THE ROLE OF NEW URBAN DEVELOPMENT
IN THE RESTRUCTURING OF METROPOLITAN RETAIL?**

Owen Wilson-Chavez and Murray D. Rice, University of North Texas

DRIVING DECISIONS: THE USE OF GIS BY RETAIL ORGANIZATIONS IN CANADA

Tony Hernandez and Matthew Emmons, Ryerson University

SPATIAL COMPETITION BY US RETAILERS

Lawrence Joseph, Arizona State University

**UNDERSTANDING FOOD AVAILABILITY IN LARGE METROPOLITAN CENTERS AND
THE POSITIONING OF INDEPENDENT AND LARGE CHAIN GROCERS FROM A
GEOGRAPHIC PERSPECTIVE**

Brian Ceh, Tony Hernandez and Daniel Boyko, Ryerson University

ECOSYSTEMS 1

Room E

Chair: Dawna Cerney, Youngstown State University

**DELIVERY OF ECOSYSTEM SERVICES IN A CHANGED ENVIRONMENT:
APPLICATION IN THE BLACK HILLS ECOREGION**

Suzanne Cotillon, South Dakota State University

**ESTABLISHING POST-FOREST FIRE VEGETATION SUCCESSION PATTERNS ON
SOFA MOUNTAIN, WATERON LAKES NATIONAL PARK, CANADA**

Dawna Cerney, Youngstown State University

Thursday, October 11, 2012

MODELING SUBALPINE AND UPPER MONTANE FOREST-CLIMAT INTERACTIONS
IN COLORADO

Steve Jennings and Eric Billmeyer, University of Colorado Colorado Springs

RANGE OF VARIABILITY IN THE LIFE CYCLE OF BEAVER PONDS IN GLACIER
NATIONAL PARK, MONTANA AS A CONTEXT FOR RESTORATION

Taylor A. Christian and David R. Butler, Texas State University – San Marcos

APPLIED CLIMATOLOGY

Room F

Chair: Mark Hildebrandt, Southern Illinois University, Edwardsville

CHANGES IN EVAPOTRANSPIRATION AND CO₂ FLUX IN CENTRAL AMAZONIA

Akio Tsuchiya, Hiroshima University, Japan

CONNECTING WITH THE PEOPLE: DEVELOPING STRATEGIES TO CONVEY
CLIMATE SCIENCE TO KANSAS STAKEHOLDERS

John Harrington, Jr., Kansas State University

TEMPERATURE VARIABILITY OVER ANTARCTICA USING THE NCEP/NCAR
REANALYSIS

Jennifer M. Collins, David R. Roache, Edgar W. Kopp IV, and Douglas Lunsford,
University of South Florida

ANALYSIS OF THE WINTERTIME URBAN HEAT ISLAND AND TEMPERATURE
INVERSIONS SILVERTON, COLORADO: 2000-2011

Mark L. Hildebrandt and Pramithus Khadka, Southern Illinois University,
Edwardsville

SESSION BREAK

3:00 pm – 3:30 pm

Thursday, October 11, 2012

SESSION T4

3:30 pm – 5:00 pm

SUSTAINABILITY POLICIES AND METRICS

Room A

Chair: Ursula Lang, University of Minnesota

LIFE, LIBERTY, AND THE PURSUIT OF HEALTH: THE BIOPOLITICS OF HEALTHY CITY DESIGN

Jessica Finlay, University of Minnesota

A SUSTAINABLE EVERYDAY? URBAN YARD AND SPACES

Ursula Lang, University of Minnesota

AN EXAMINATION OF THE SUSTAINABLE COMMUNITIES REGIONAL PLANNING GRANT PROCESS IN THE PIEDMONT TRIAD OF NORTH CAROLINA

Russell M. Smith, Winston-Salem State University

U-SPATIAL: SPATIAL SCIENCE AT THE UNIVERSITY OF MINNESOTA

Room B

Organizer and Chair: Len Kne, University of Minnesota

Panelists:

Francis Harvey, Associate Professor, University of Minnesota

Kristi Jensen, Academic Programs Director, University of Minnesota

Joseph Knight, Assistant Professor, University of Minnesota

Vipin Kumar, William Norris Professor and Head, Computer Science and Engineering, University of Minnesota

David Van Riper, Spatial Core Director, University of Minnesota

Len Kne, Associate Director, U-Spatial, University of Minnesota

Thursday, October 11, 2012

LOCAL EVIDENCE OF NATIONAL RETAIL TREND

Room: CD

Organizer and Chair: Tom Dwyer, Dutch Hill Consulting, Inc.

APPLIED PHYSICAL GEOGRAPHY

Room E

Chair: Richard Shaker, Binghamton University

SEDIMENTATION FROM A SMALL MAGNITUDE UPPER MISSISSIPPI RIVER FLOOD

Colin S. Belby, University of Wisconsin – La Crosse

AQUATIC CONDITION IN THE HEADWATERS OF THE SUSQUEHANNA RIVER BASIN

Richard Shaker, Guillermo Espinosa and Erika Chin, Binghamton University

LANDSCAPES OF MOVEMENT IN AMAZONIA: NEW DATA FROM ANCIENT SETTLEMENTS IN THE MIDDLE AND LOWER AMAZON

Morgan J. Schmidt, Coordenação de Ciências Humanas, Museu Paraense Emílio Goeldi (MPEG), Belém, Brazil

MODELING WITH GIS AND REMOTE SENSING

Room F

Chair: Christopher Badurek, Appalachian State University

USE OF TERRAIN MODELS IN GEOGRAPHIC INFORMATION SYSTEM TO IDENTIFY LANDSCAPE EROSION IN THE UPPER DEVILS LAKE BASIN, North Dakota

Matthew J. Dinger and Gregory S. Vandenberg, University of North Dakota

Thursday, October 11, 2012

**TREE-DIMENSIONAL BUILDING MODELING USING STRUCTURE FROM MOTION:
IMPROVING MODEL RESULTS WITH TELESCOPIC POLE AERIAL PHOTOGRAPHY**

Adam J. Mathews and Jennifer L. R. Jensen, Texas State University – San
Marcos

**APPLICATION OF A GIS-BASED FOREST LOSS SUSCEPTIBILITY MODEL FOR
REGIONAL LAND USE PLANNING**

Dylan Philyaw and Christopher A. Badurek, Appalachian State University

**MODELING SPATIAL DIFFUSION PROCESSES WITH REGRESSION CURVE
ESTIMATION**

Jay Lee, Kent State University

Jinn-Guey Lay and Yu-Lin Chi, National Taiwan University

EVENING SESSION

RETAIL/BUSINESS GEOGRAPHY DISCUSSION SESSION

5:30 pm – 6:30 pm, ROOM: AVALON

Organizer and Moderator: Murray Rice, University of North Texas

APPLIED GEOGRAPHY EDITORIAL BOARD MEETING

6:00 pm – 7:30 pm, ROOM A

Organizer and Chair: Jay Gatrell, Indiana State University

Friday, October 12, 2012

FRIDAY, OCTOBER 12, 2012

REGISTRATION

8:00 AM – 12:00 Noon

POSTERS

8:30 AM – 3:30 PM

SESSION F1

8:30 am – 10:00 am

GEOGRAPHY EDUCATION 2

Room A

Chair: Ellen Foster, University of Mississippi

SELF-EFFICACY AND PERFORMANCE OF HIGH SCHOOL STUDENTS ON A MAP SKILLS SURVEY

Gillian Acheson, Southern Illinois University, Edwardsville

INTRODUCING THE COMMON CORE: GEOGRAPHY EDUCATION IN THE 21ST CENTURY

Zach Matkins and Ellen J. Foster, University of Mississippi

WORLD REGIONAL GEOGRAPHY: FIFTEEN YEARS OF STUDENT PREFERENCES

Ginger L. Schmid, Forrest D. Wilkerson, Minnesota State university

Michelle L. Shuey, Edinboro University

Friday, October 12, 2012

URBAN GEOGRAPHY 3: SPRAWL AND STRUCTURE

Room B

Chair Timothy J. Bailey, Pittsburg State University

TRACKING URBAN SPRAWL: EXAMINING CHANGING LAND USE COVER

Timothy J. Bailey and Hyun Joong Kim, Pittsburg State University

**ANALYSIS OF EXURBANIZATION WITHIN THREE METROPOLITAN AREAS
THROUGH SATELLITE IMAGERY AND GIS**

Thomas Green, Minnesota State University

**ANALYSIS OF URBAN SPRAWL OF CHANGCHUN AND JILIN 2000-2009:
CHARACTERISTIC AND DRIVING FORCES**

Pingjun Sun, Northeast Normal University, China

**IMPACT OF URBAN CONSTRUCTIONS WEIGHT ON INSTABILITY, CASE STUDY
(DISTRICT 1 OF REGION 2 MUNICIPALITY OF TEHRAN)**

Parviz ZeaieanFirouzabadia, Ezatallah Ghanavati, and Zeinab Bayatishedaghat,
Kharazmi University, Tehran, Iran

HEALTH AND BUSINESS GEOGRAPHY

Room: Avalon (Third Floor)

Chair: Murray D. Rice, University of North Texas

**AN EXPLORATION OF ALTERNATIVE FOOD DESERT DEFINITIONS IN SOUTH
DALLAS**

Amanda Regan and Murray D. Rice, University of North Texas

FOOD DESERTS AND MINORITY POPULATION IN AKRON, OHIO

Mohammad Alnasrallah, Kent State University

Friday, October 12, 2012

AN ANALYSIS OF FOOD TRUCK LOCATIONS IN AUSTIN, TEXAS

Deborah Hann, Texas State University – San Marcos

MAPPING FOOD DESERTS WITHIN THE BALTIMORE METROPOLITAN REGION

Justin Mannion, Alex Stapleton, and Shuang Wu, Towson University

HAZARDS 2: FLOODS

Room E

Chair: Richard A. Earl, Texas State University – San Marcos

SITE, SITUATION, AND PROPERTY OWNER DECISION-MAKING AFTER THE 2002 GUADALUPE RIVER FLOOD

Elyse M. Zavar, Ronald R. Hagelman III, and William M. Rugeley II, Texas State University – San Marcos

FLOODING DOWNSTREAM OF FLOOD CONTROL DAMS IN SAN MARCOS, TEXAS

Richard A. Earl and Charles Flatten, Texas State University – San Marcos

SURVEY ANALYSIS OF SUSTAINABLE WATER RESOURCE PLANNING IN THE HEADWATERS OF SOUTHERN APPALACHIA

Christopher A. Badurek, Robin hale, and Kristan Cockerill, Appalachian State University

FLOOD DAMAGE ASSESSMENT USING REMOTE SENSING, GIS AND GPS TECHNOLOGIES, CASE STUDY: GORGAN PROVINCE, NORTH-EATERN PART IRAN

Parviz ZeaieanFirouzabadi, Kharazmi University

Saeed Saroei and Esmat Madaniyah, Ministry of Jihad-e-Agriculture, Tehran, Iran

Friday, October 12, 2012

GIS & CARTOGRAPHY 2: PUBLIC SERVICES

Room F

Chair: Shunfu Hu, Southern Illinois University, Edwardsville

ONLINE MAPPING FOR FIRE SERVICE FIRST RESPONDERS

Shunfu Hu, Southern Illinois University, Edwardsville

USING GIS TO EXAMINE EVACUATION NEED AND SHELTER LOCATIONS IN BROWARD COUNTY, FLORIDA

Shivangi Prasad, Florida Atlantic University

A GIS-BASED APPROACH TO REDISTRICTING FOR THE MICHIGAN STATE POLICE

Matthew T. Patton, Texas State University – San Marcos

THREE-DIMENSIONAL MODELING OF LEAD CONTAMINATION IN AN URBAN WEDLAND

Cody Mertens, Ryan Perroy, Colin Belby, Sara Erickson, University of
Wisconsin – La Crosse

SESSION BREAK

10:00 am – 10:30 am

Friday, October 12, 2012

SESSION F2

10:30 am – 12:00 pm

SOCIOECONOMIC GEOGRAPHY

Room A

Chair: Bradley Cullen, University of New Mexico

ECOLOGICAL FACTORS THAT DETERMINE THE LOCATIONS OF GANG AND
NON-GANG RESIDENCE, ALBUQUERQUE, NM 1996-2006

Matthew Laurin, Florida State University

Timothy Hare and Paul Steele, Morehead State University

THE WILDFIRE HAZARD IN BERNALILLO COUNTY, NEW MEXICO, USA

Kim Seidler and Bradley Cullen, University of New Mexico

ONE PLUS ONE DOES NOT EQUAL ONE: AN ECONOMIC DEVELOPMENT MODEL
FOR THE WIND RIVER RESERVATION

William J. Gribb, University of Wyoming

URBAN GEOGRAPHY 4: ENVIRONMENTAL MANAGEMENT

Room B

Chair: Trisha Jackson, South Dakota State University

BROWNFIELD DEVELOPMENT AND PUBLIC-SECTOR SUPPORT: INSIGHTS AND
SUGGESTIONS FROM DEVELOPERS IN MILWAUKEE, WISCONSIN

Linda McCarthy, University of Wisconsin-Milwaukee

COMMUNITY PERCEPTION OF TEXAS WATER REUSE PROGRAMS

Shae R. Luther and Richard W. Dixon, Texas State University – San Marcos

URBANIZING IMPACT ON THE MAXWELTON SINK CAVE SYSTEM

Lee Stocks, Mansfield University

Friday, October 12, 2012

URBAN GARDENING STRATEGIES FOR MANAGING AND MITIGATING URBAN SOIL CONTAMINATION

Trisha Jackson, South Dakota State University

THE BUSINESS OF APPLIED PROFESSIONAL GEOGRAPHIC PRACTICE

Room: Avalon (Third Floor)

Organizer and Chair: Edwin Butterworth, CACI International

Panelists:

Edwin Butterworth, CACI International

William Graves, University of North Carolina, Charlotte

Joseph Kerski, ESRI, Inc.

Rich Quodomine, New York State Department of Transportation

Murray Rice, University of North Texas

GEOGRAPHY OF HEALTH 2

Room E

Chair: Debarchana Ghosh, University of Connecticut

IMPACT OF NEIGHBORHOOD CHARACTERISTICS ON STANDARDIZED MORTALITY RATE

Yoo Hyung Joo and Hee-Yeon Lee, Seoul National University

SOIL LEAD CONTAMINATION, INCOME LEVEL, AND RACE AT CHILD DAY CARE CENTERS IN GREATER CINCINNATI

Charles E. Button, Central Connecticut State University

MEASURING PHYSICIAN ACCESSIBILITY IN OKLAHOMA CITY, OKLAHOMA

Stacey R. Brown, Southern Illinois University, Edwardsville

Friday, October 12, 2012

A GEOGRAPHICAL ANALYSIS OF MATERNAL MORTALITY IN AFRICA

Richard O. Djukpen, Lindenwood University

REMOTE SENSING 2

Room F

Chair: Paporn Thebpanya, Towson University

COMPARING THE PHENOLOGY OF BURNED AND UNBURNED TALLGRASS PRAIRIE USING IN SITU SPECTROSCOPY

Rhett L. Mohler, Saginaw Valley State University

TREE CANOPY FOLIAR VOLUME FROM TERRESTRIAL LIDAR SCANNER DATA

Clint Harper, Nate Currit, and Jennifer Jensen, Texas State University – San Marcos

USING TERRESTRIAL PHOTOGRAPHY TO MEASURE STREAM MORPHOLOGY

Dustin Menhart, U.S. Military Academy

STUDY ON THE MORPHODYNAMIC CHANGES OF YAKHAR GLACIER USING REMOTE SENSING AND GIS TECHNOLOGY

Parviz ZeaieanFirouzabadia and Saideh Fakhari, Kharazmi University

Saeed Khodaeiyan, Shahid Beheshtiy University, Tehran, Iran

LUNCHEON

1:00 pm – 1:30 pm

Speaker: J. Drake Hamilton, Fresh Energy

GEOGRAPHY APPLIED TO CLIMATE CHANGE SOLUTIONS

Room: CD

Friday, October 12, 2012

SESSION F3

1:30 pm – 3:00 pm

LIVING IN THE SUSTAINABLE CITY?

Room A

Chair: Jerry Shannon, University of Minnesota

UNFRIENDLY INFRASTRUCTURE: AN URBAN SOCIO-ECOLOGICAL STUDY OF
ELDERLY PEDESTRANS' RISKS IN SOUTH FLORIDA

Rosibel Roman, Florida International University

BALANCING LOCALIZATION AND ACCESSIBILITY IN URBAN FLLD INITIATIVES

Ivan Bialostosky, University of Minnesota

FOOD DESERTS AND THE HEALTHY CITY: BRINGING PRACTICE INTO METRICS
OF FOOD ACCESSIBILITY

Jerry Shannon, University of Minnesota

TRANSPORTATION GEOGRAPHY

Room B

Chair: Russell Ivy, Florida Atlantic University

FORECASTING BICYCLING RISK FACTORS WITHIN NEIGHBORHOODS: A SPATIAL
AUTOREGRESSIVE APPROACH

Greg Rybarczyk, University of Michigan – Flint

CHANGING JOBS-HOUSING RELATIONSHIP IN BEIJING: AN EXCESS
COMMUTING PERSPECTIVE

Enru Wang, University of North Dakota

Friday, October 12, 2012

GIS VEHICLE ROUTING FOR SUSTAINABLE WASTE COLLECTION IN THE CITY OF ALTOONA, PENNSYLVANIA

Timothy Dolney, University of Pennsylvania – Altoona

THE GEOGRAPHY OF MARKET CONCENTRATION IN THE US AIRLINE INDUSTRY

Hilton A. Cordoba and Russell L. Ivy, Florida Atlantic University

ECOSYSTEMS 2

Room E

Chair: Tara Root, Florida Atlantic University

ENVIRONMENTAL CONTROLS ON THE DISTRIBUTION AND VIGOR OF AN ENDANGERED GRASS (*PANICUM ABSCISSUM* SWALLEN)

Tina Kuhn, Tara Root, Suellen Granberry-Hager, Florida Atlantic University

USE OF HIGH-RESOLUTION PUBLIC IMAGERY TO ASSIST IN HABITAT IDENTIFICATION AND WILDLIFE MONITORING EFFORTS: A CASE STUDY OF CONCHO WATER SNAKE HABITAT

Megan Zoch and Jennifer L. R. Jensen, Texas State University – San Marcos

A SMALL-SCALE ANALYSIS OF TROPICAL DEFORESTATION: A CASE STUDY OF KIMVULA TERRITORY IN DEMOCRATIC REPUBLIC OF CONGO

Confiance L. Mfuka, South Dakota State University

Matthew C. Hansen, University of Maryland

GEOGRAPHIC AREA CLASSIFICATION AND ANALYSIS OF CENSUS BUREAU

Room F

Organizer and Chair: Michael R. Ratcliffe, US Census Bureau

NEW US FRONTIER AND REMOTE (FAR) TAXONOMY

Friday, October 12, 2012

Gary Hart, University of North Dakota

John Cromartie, USDA

NO LONGER THE RESIDUAL: CONSIDERATIONS IN THE DEVELOPMENT OF
RURAL STATISTICAL AREAS

Michael R. Ratcliffe, US Census Bureau

EMPLOYMENT IN TRADITIONAL CENTRAL BUSINESS DISTRICTS, 1970-2010

Todd Gardner, Christopher J. Henrie, and Kevin Hawley, US Census Bureau

RACIAL AND ETHNIC ENCLAVES IN CALIFORNIA

Vincent Osier, US Census Bureau

SESSION BREAK

3:00 pm – 3:30 pm

Friday, October 12, 2012

SESSION F4

3:30 pm – 5:00 pm

SOCIAL ISSUES

Room A

Chair: Roxanne T. Ornelas, Miami University, Ohio

**WE WALK FOR THE WATER: A CASE STUDY ON THE GEOGRAPHIES OF
INDIGENOUS PEOPLES**

Roxanne T. Ornelas, Miami University, Ohio

BLOOD GOLD

Tijjani Sadiya Baba, Ibrahim Asma, and Halilu Ahmad Shaba, Nigerian Space
Research and Development Agency, Abuja, Nigeria

**MIGRATION, RESIDENTIAL SATISFACTION, AND THE DEVELOPMENT OF
BUENOS AIRES' VILLAS MISERIAS**

Peter Mathison, Macalester College

PROFESSIONAL DEVELOPMENT OF APPLIED GEOGRAPHERS

Room B

Chair: Michael N. DeMers, New Mexico State University

**FACTORS AFFECTING THE PERFORMANCE AND PROFESSIONAL IDENTITIES OF
GEOGRAPHERS IN BUSINESS, GOVERNMENT, AND NONPROFIT
ORGANIZATIONS**

M. Beth Schlemper, Joy Adams, and Michael Solem, University of Toledo

DEVELOPMENT OF A GIS INTERNSHIP PROGRAM

Hyun Joong Kim, Pittsburg State University

Friday, October 12, 2012

PRELIMINARY COMPARATIVE ANALYSIS OF GIS WORKFORCE EDUCATION:
LINKING PRACTITIONERS WITH EDUCATORS

Michael N. DeMers, New Mexico State University

“TRUE GEOGRAPHERS:” ETHNOGRAPHIES OF TEACHING AND LEARNING IN
THE FIELD

Jennifer Speights-Binet, Samford University

TECHNICAL ADVANCES IN APPLIED GEOGRAPHY

Room E

Chair: Eric Compas, University of Wisconsin-Whitewater

TARGETING VS. CONNECTING IN BIOTECHNOLOGY

Harrison S. Campbell and Erin M. Watkins, University of North Carolina,
Charlotte

Gary M. Kunkle, Outlier, Inc., Huntersville

THE WEB AND GLOBAL CITIZENSHIP: AN ONLINE VIRTUAL EXCHANGE

Eric Compas, University of Wisconsin-Whitewater

ASPEN, FIRE, AND REPRODUCTIVE ASSOCIATIONS WITH ITS SURVIVAL

Kevin A. Gilsdorf, Texas State University – San Marcos

GEOSPATIAL ANALYSIS

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SPATIAL ANALYSIS OF VECTOR-BORNE WEST NILE VIRUS POSITIVE SITES IN
FAIRFAX, VA FOR EMERGENCY PLANNING

Robert Godrey, Sabre Systems, Inc.

Friday, October 12, 2012

THE DISTANCE BETWEEN THE MINORS AND MAJORS IS CLOSER THAN YOU
THINK

Kevin Romig and Julie Romig, Texas State University – San Marcos

A HIERARCHICAL LOCATION MODEL FOR EARTHQUAKE SHELTER PLANNING

Xiang Chen, Ohio State University

USING CELLULAR AUTOMATA URBAN GROWTH MODEL TO ESTIMATE THE
COMPLETENESS OF AN AGGREGATED ROAD DATASET

Tiernan Erickson, U.S. Census Bureau

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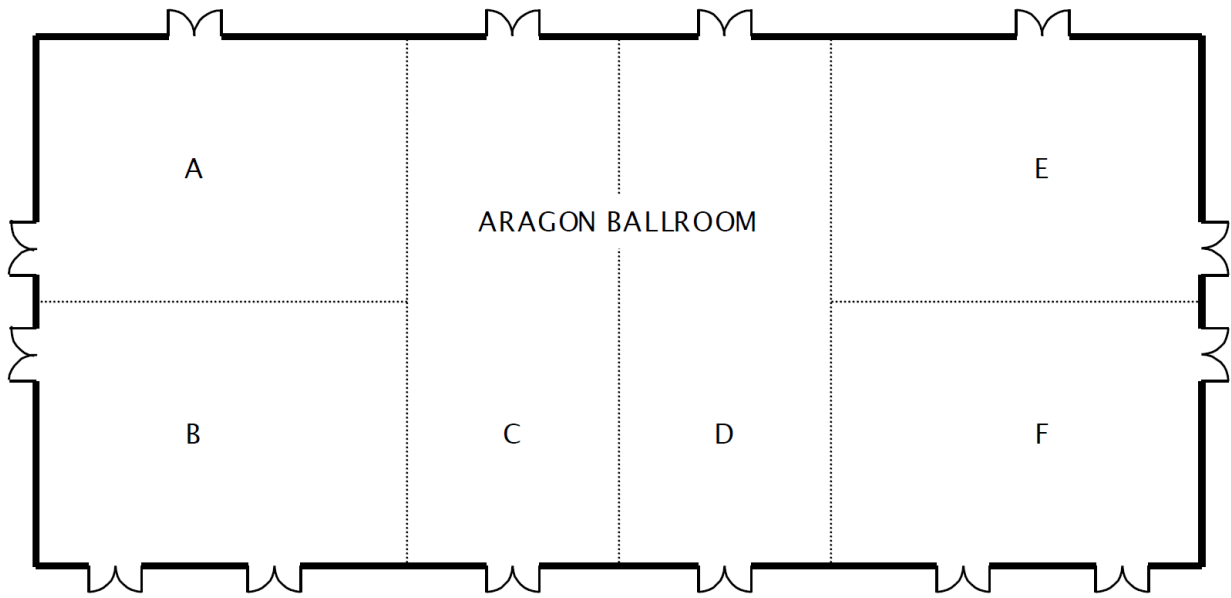
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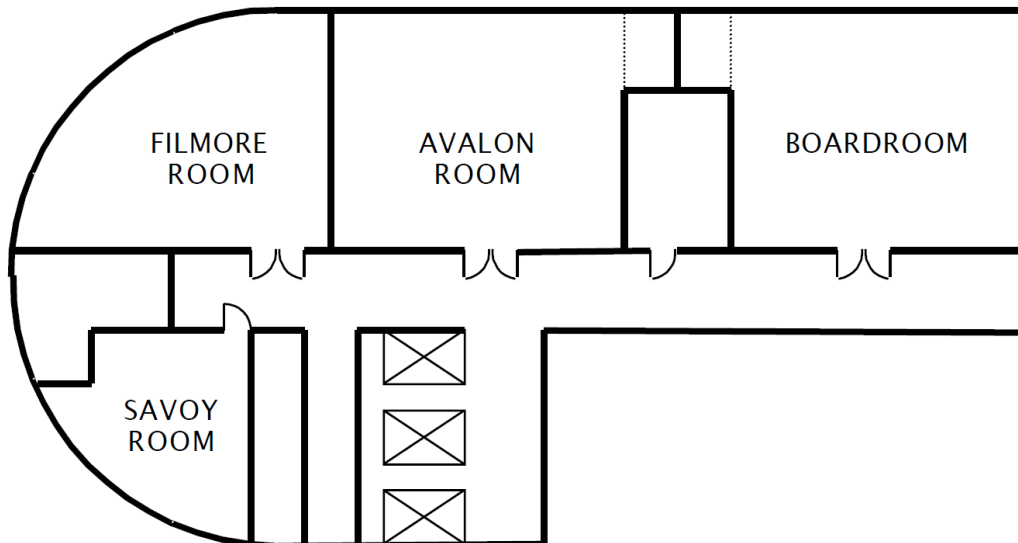
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A GEOGRAPHICAL ANALYSIS OF MATERNAL MORTALITY IN AFRICA

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Abstract

Maternal mortality is reportedly high in developing countries of the world. It constitutes over 90 percent of the cause of female deaths in sub-Saharan Africa. Maternal mortality rate is significant in the determination of the reproductive and health status of people. A number of issues arise from the high prevalence of maternal mortality in developing countries that needs investigation and understanding. These include demographic variables, economic status, political priorities, and healthcare accessibility or otherwise of the people. In spite of the provision of healthcare facilities at primary, secondary and tertiary levels in some African countries, the level of maternal mortality has remained high. What then could be responsible for the failure to reduce the level of maternal mortality? This paper examines the spatial pattern of maternal mortality in Africa, using geospatial techniques. It further uses statistical methods to establish relationships between these variables. Finally, it suggests remedies to ameliorate the problems of maternal mortality.

A GIS BASED APPROACH TO REDISTRICTING FOR THE MICHIGAN STATE POLICE

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Abstract

The Michigan State Police (MSP) consists of sixty posts throughout the state. Each post is comprised of minor civil divisions (MCD). MCDs are synonymous with townships and are the building blocks for Michigan. Posts are awarded resources in an ad hoc and subjective manner. The MSP could be restructured in such a manner that resource distribution did not pit posts against one another. A GIS based solution could distribute an even amount of resources, based on variables affecting the posts. The variables used were trunkline mileages, freeway mileages, population density, MSP service indicators, crime, and the presence of correctional facilities. Data were collected from various sources and were then annealed down to the MCD level. The variables underwent a Box-Cox transformation to normalize them and were then combined into a unit-less composite variable. Once all of the MCDs had variables attached to them, new post boundaries were constructed. New post boundaries were built using an extension of ArcGIS. First, the existing posts were reconstructed and from there, MCDs were added or subtracted. There were constant updates on the composite variable to see if each of the posts being modified were being equalized. Each district underwent a range of fifteen to twenty iterations and each district showed drastic improvements. This indicated that the districting software was working correctly. Overall, the study shows that the GIS based approach is promising and could prove to be even more effective in the future.

Key words: redistricting, resource distribution, composite variable

A HIERARCHICAL LOCATION MODEL FOR EARTHQUAKE SHELTER PLANNING

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Abstract

The problem of emergency facility location is an imperative component in evacuation planning. A previously overlooked facet of the problem is the consideration of a hierarchical structure in the setting of earthquake shelters. Because people affected by an earthquake have adopted different evacuation strategies between short-term and long-term periods, the needs for emergency supplies and accommodation facilities vary. For example, it was observed that camping equipments were mostly needed three days after the occurrence of the earthquake, and when the influence extends to more than ten days, household living facilities such as lavatories and kitchens are in emerging need of coordination. . Therefore, designing and locating earthquake shelters should prioritize these different sheltering purposes on the temporal scale, and at the same time take into account the accessibility to residential areas and availability of land uses in the planning area.

The different functionalities of earthquake shelters have been qualitatively examined by many scholars with respect to their political-economic role in the post-disaster recovery. However, existing studies have yet taken a further step to explore the location problem of shelters with a consideration of their temporal hierarchy. The paper proposes a 3-level hierarchical location model for locating earthquake shelters by taking into account the differences between immediate shelters, short-term shelters and long-term shelters. The paper not only scrutinizes the modeling procedure but also implements the model in a planning area with many implementable technical details. The results in a GIS context provide an elaborated procedure of earthquake shelter planning that involves the spatial distribution of the shelters, the assignment of demand/supply pairs, and the proposed evacuation routes to minimize contingent risks in the post-disaster evacuations. As the first attempt to optimize the hierarchical configuration of emergency shelters in a GIS, this paper is of great significance for decision-makers to gain some insights into emergency shelters being strategically placed.

Key words: hierarchy, location modeling, earthquake shelters, evacuation

A SMALL-SCALE ANALYSIS OF TROPICAL DEFORESTATION: A CASE-STUDY OF KIMVULA TERRITORY IN DEMOCRATIC REPUBLIC OF CONGO

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Abstract

Forests ecosystems represent an important component of natural systems. Despite their importance, several authors showed global evidences of deforestation, especially in the tropics. This research aimed to conduct a small-scale analysis of tropical deforestation for the decade 2000-2010 in order to better understand this process and depict its main drivers. The use of reflectance values extracted from Landsat Enhanced Thematic Mapper Plus (ETM+), Elevation data extracted from Shuttle Radar Topography Mission (SRTM) images, and data collected in the field (trees height and circumference) contributed in reconstituting the temporal vegetation dynamic. A linear regression of parameters collected in the field and elevation data showed the occurrence of deforestation at higher altitudes, while mature forests showed lower reflectance than regenerating forests because of the difference in the canopy structure. Finally trees height and trees circumference data were used in combination with land cover and land use to spatially assess deforestation.

Key words: Forest, Deforestation, Tropical deforestation, Deforestation drivers, Landsat, Reflectance, Linear Regression, Land use, Land cover, Democratic Republic of Congo.

A SUSTAINABLE EVERYDAY? URBAN YARD SPACES

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Abstract

Urban yards are one key arena in which residents are confronted with an array of everyday social and environmental issues – from negotiating a shared hedge with a neighbor to governmental regulations about fertilizer use. Surprisingly, yards remain on the margins of urban sustainability initiatives and scholarly debates. In this paper, I analyze city sustainability planning and environmental advocacy perspectives on yards in Minneapolis, MN through policy analysis and expert interviews. I discuss these in relation to ethnographic fieldwork with residents in their front and back yards in several Minneapolis neighborhoods. I propose that yards and how people relate to them have the potential to both reinforce and disrupt socio-spatial demarcations within neighborhoods and the city itself. My research suggests a much more complex mix of factors shapes how people interact with their urban environments than is usually a part of the conversation about urban sustainability.

Keywords: yards, urban sustainability, planning, everyday, practice, ethnography

ADVANCING GEOGRAPHIC LITERACY BY INCREASING GEOGRAPHY IN THE PRE-SERVICE SOCIAL STUDIES METHODS CLASSROOM

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Abstract

Based on an over-arching goal of advancing geographic literacy, it is increasingly important for geography to be an important component in today's pre-service teacher social studies methods courses. Current social studies teaching certification processes are not uniform and the social studies curriculum is history-centric. Improving spatial reasoning utilizes multiple parts of the brain and these circumstances identify a need for pre-service geography content knowledge and geography pedagogical content knowledge. Professional development activities focused on geography teaching strategies, available resources to support geography education, and the use of Geographic Information Systems (GIS) in the K-12 classroom were presented to social studies methods classes at Kansas State University. Through analysis of student pre- and post-surveys and reflection papers gathered during the professional development, it is demonstrated that greater geography awareness can be achieved. It is concluded that the more geography content and pedagogy exposure the pre-service teacher has during their education, the better geography teacher they will be, thus the higher quality geography education their students will receive.

AN ANALYSIS OF FOOD TRUCK LOCATIONS IN AUSTIN, TEXAS

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Abstract

The last few years have seen a massive increase in the popularity of food trucks and food carts in cities all across the country; indeed, they are one of the fastest growing sectors of the restaurant industry. This rapid growth sparks questions about where such trucks tend to locate and why owners choose those particular sites. To begin answering these questions, this research explores food truck locations in Austin, Texas and, using GIS, analyzes their spatial patterns, including investigating whether food trucks tend to cluster together, and if they tend to be consistently located near areas with higher foot traffic.

AN EXAMINATION OF THE SUSTAINABLE COMMUNITIES REGIONAL PLANNING GRANT PROCESS IN THE PIEDMONT TRIAD OF NORTH CAROLINA

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Abstract

During the Fall 2010, the Piedmont Triad region of North Carolina received a Sustainable Communities Planning Grant from HUD. The purpose of this \$1.6 million grant was to create a regional vision of sustainability for twelve counties, more than 70 municipalities, 4 different transportation planning organizations and 1.6 million residents. In practice the development of this regional vision has been much more difficult than originally thought. The urban-rural divide, core city- suburb dichotomy and sub-regional alliances have all plagued the effort. This paper examines the current efforts to develop a regional sustainable plan in the Piedmont Triad, discusses obstacles to the process, and provides suggestions for future planning. The future prosperity of the Piedmont Triad may hinge on the success of this program and its ability to integrate a range of ideas into a cohesive regional agenda.

Keywords: New Urbanism, planning, Smart Growth, sustainability

AN EXPLORATION OF ALTERNATIVE FOOD DESERT DEFINITIONS IN SOUTH DALLAS

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Abstract

Background: Food retailers moving to the suburbs have left geographic food service gaps, called food deserts, which have resulted in many inner city neighborhoods having little or no access to healthful foods. There is a large body of literature concerning food deserts; however, much of this existing literature focuses on access to large national chain grocery retailers (supermarkets), and excludes smaller grocery and corner stores. Including small and alternative food retailers in the food desert framework can lead to more informed decisions for public policy and business strategy. This paper identifies how alternative grocery distribution channels create spatial variation in food deserts. **Results:** The findings suggest that including small grocery retailers in the analysis makes a meaningful difference in the geographic patterns of food deserts identified in south Dallas. **Conclusion:** Including small store formats alongside their larger competition leads to an improved profile of the neighborhood food service environment.

Key words: food desert, retail, chain store, grocery store, Dallas.

ANALYSIS OF EXURBANIZATION WITHIN THREE METROPOLITAN AREAS THROUGH SATELLITE IMAGERY AND GIS

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Abstract

Urban sprawl within three metropolitan areas were analyzed through remote sensing satellite imagery, with the purpose to determine whether exurbia has become an extension of America's growing suburbia; and if so, is its existence reliant on geographic location. This process was conducted through an analytical approach that included an attempt to define exurbia, despite inconsistent and conflicting scholarly opinions. The three study areas included were: St. Louis, Twin Cities and Los Angeles. All three were evaluated through 1990 and 2000 census tract data, satellite imagery, and spatial analysis. Calculation on the level of impervious verses non-impervious land area for selected census tracts were determined, where findings indicate a substantial increase of urban sprawl within St. Louis and Twin Cities; whereas, Los Angeles maintained a level of compact urban development. These findings suggest two different results: (1) Los Angeles has a high probability that exurbia is an extension to suburbia, and (2) St. Louis and Twin Cities experienced substantial increase of urban sprawl that represent the possibility of continued exurban existence.

ANALYSIS OF FATALITY ACCIDENT DATA IN RURAL AREAS

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Abstract

Analysis of fatality automobile accident data can be challenging in rural areas where a relatively small number of such accidents occurs on specific sections of highways. Combining crash data from the Fatality Analysis Reporting System (FARS) and highway design specifications from the Oklahoma Department of Transportation (ODOT) in a geo-referenced database (GIS), this paper employs advanced statistical methods to determine what roadway characteristics (e.g. grade, geometry, and design) are most associated with fatal accidents on predominantly rural (including tribal) segments of roadways in northeast Oklahoma. The results provide information about what combinations of highway design traits have contributed most to past crashes and therefore can identify potentially dangerous road segments system-wide. This information will help transportation engineers evaluate current construction practice and seek ways to address design issues that are shown to contribute significantly to serious crashes.

Key words: Transportation, GIS applications, Applied analysis methods

ANALYSIS OF THE WINTERTIME URBAN HEAT ISLAND AND TEMPERATUTRE INVERSIONS IN SILVERTON, COLORADO: 2000-2011

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Abstract

Traditional studies of the urban heat island (UHI) effect and temperature inversions have focused on large cities. More recently, some researchers have studied climatic patterns in cities of smaller size and the findings have been similar, just to a lesser degree. Far fewer studies have investigated the UHI and temperature inversions in small mountain towns. In this paper, we present the results of repeated measurements of air temperature that suggest the presence of an UHI effect and localized temperature inversions in the small town of Silverton, Colorado in wintertime.

From 2000-2011, air temperatures were measured over 24-hour periods along an established transect that runs from the southern outskirts of town, through the town center, and ends on the northern edge of town. Along each transect there are 11 measurement points. The first four locations and last 2 locations are considered as ‘non-center’ while the middle 5 locations have been classified as ‘center’. Analysis involved a one-tailed test to determine if there were either positive or negative difference between the “center” and “non-center” for each sampling time. A positive mean difference indicated a significant UHI effect while a negative mean difference indicated temperature inversions in this small mountain town in wintertime.

Keywords: Applied Climatology, Urban Heat Islands, alpine

ANALYSIS OF URBAN SPRAWL OF CHANGCHUN AND JILIN 2000-2009: CHARACTERISTICS, EFFECTS AND DRIVING FORCES

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Abstract

China is undergoing the most rapid and largest process of urbanization all over the world. Rapid changes have been experienced most noticeably in big cities in terms of economic growth with effects on social system, environment, infrastructure and land uses. This research tended to explore the degree, characteristics, effects, and driving forces of urban sprawl in China, based on two typical inland cities in Northeast China, Changchun and Jilin. Classification of urban sprawl patterns proposed by Burchell (1999) was used as the theoretical framework in this study. Remote sensing data were integrated with other social, economic data collected from statistical yearbooks in the years of 2000, 2005 and 2009. Image processing and GIS techniques were employed to examine the two cities' urban sprawl processes, from the perspective of land use changes, compactness of city structures, forms of urban expansion, and the transformation of arable land. Multiple linear regression and principal component analysis were then applied to uncover the driving forces and impacts of urban sprawl of the two cities. The results demonstrated that both cities shared certain common features as well as some unique characteristics in the sprawl process. Meanwhile, both cities reveal unlike patterns of urban sprawl from western countries and several coastal counterparts in China.

Key words: urban sprawl; remote sensing, GIS and statistical analysis; China.

APPLICATION OF A GIS-BASED FOREST LOSS SUSCEPTIBILITY MODEL FOR REGIONAL LAND USE PLANNING

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Abstract

Increasing growth in housing and resulting loss of forested lands are significant issues to western North Carolina residents due to associated effects on both ecosystem services and the local economy's second home market. To further understand the rate of housing density change and potential environmental impacts, a GIS-based model of forest loss susceptibility has been developed to forecast land use changes for Watauga County, NC. The model is derived from land cover, terrain, land value, infrastructure, and prior growth rate variables and implemented into a script for running at varying temporal intervals. Assessment of the model in Watauga County indicates a 30% transition of forested areas to developed low density exurban areas over a 15 year time period with significant pockets of growth constrained to hotspots of recreational amenities. This study's results are applied to improving land conservation decision-making to support regional planning and land trust organization efforts.

Keywords: GIS, modeling, forested lands, land use land cover change, planning, sustainability, land conservation, housing market.

APPLICATION OF THE TORNADO IMPACT-COMMUNITY VULNERABILITY (TICV) INDEX TO THE 2011 TORNADO SEASON.

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Abstract

According to the National Oceanic and Atmospheric Administration, 2011 was the 4th deadliest tornado year on record. April and May were especially active, with 758 tornadoes and 360 fatalities in the former and 326 tornadoes and 178 fatalities in the latter. On 22 May 2011, the single deadliest tornado since 1950 struck the Missouri community of Joplin, leaving 161 dead and causing an estimated two billion dollars in damage. Many other large and destructive tornadoes ripped through the southeastern U.S., killing hundreds and causing billions in damage.

This research explores tornadoes that intersected U.S. communities during the 2011 season. Using the TICV (Stimers 2011), all events that struck a community were examined for the length of the track in that community only, with the number of fatalities, damage in dollars, and vulnerability score all normalized by population and scaled to calculate the TICV index value and resulting TICV Category (TC). This new scale gauges impact on an individual community, and is based on factors other than physical magnitude of the event. By taking into account losses (economic and loss of life) and coupling those with pre-existing vulnerability of the community, the TICV produces a measure that can help describe overall impact on that community.

Keywords: Tornadoes, Tornado Impact, Community Vulnerability

APPLICATION OF UAV IMAGERY FOR LAND COVER MAPPING AND TERRAIN MODELING

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Abstract

Aerial photography and digital, remotely sensed imagery have been widely used for terrain modeling and land cover mapping and monitoring programs for decades. While the spatial, spectral, and radiometric resolution of these systems has improved dramatically, the availability and/or application of these data are still limited by cost and relatively poor temporal resolution, or revisit time. These limitations are especially problematic when mapping or monitoring efforts require repeat coverage over the duration of days or even hours. The application of civilian UAVs has recently emerged as a viable alternative to traditional remote sensing techniques; particularly when very high spatial and temporal resolution may be sacrificed at the expense of spectral and radiometric resolution. This presentation describes the use of a commercially available UAV outfitted with two modified, consumer grade digital cameras for collecting very high resolution (e.g. 4 cm) colour and near infrared imagery. The workflow for processing and classifying the imagery to obtain detailed vegetation classifications will be described, as well as current research utilizing this imagery for the identification of critical habitat, monitoring invasive species, assessing riparian health, and the development of high resolution digital elevation models.

EXPLORING LANDSCAPE FORM AND UPLAND FOREST FRAGMENTATION ON AQUATIC CONDITION IN THE HEADWATERS OF THE SUSQUEHANNA RIVER BASIN

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Abstract

Multivariate spatial analyses provide important insight into the mechanisms of landscape-species relationships. Increased evidence suggests that the amount of land cover (e.g., pasture) has an impact on aquatic ecosystems; however research remains on the impacts of landscape form and upland forest fragmentation on instream ecological condition. Using a macroinvertebrate index to describe aquatic condition, this study presents empirical evidence about the interaction between landscape form and upland forest fragmentation as they affect aquatic ecology. This study is situated in the headwaters of the Susquehanna River Basin using 52 sample locations within 29 watersheds. We hypothesize that landscape form and fragmentation of upland forest at the HUC-10 watershed scale affects instream biotic integrity. Using exploratory spatial data analysis (ESDA), ordinary least squares (OLS) regression, geographically weighted regression (GWR), and classical discriminant analysis to test relationships, findings reveal that fragmentation of upland forest explained the greatest amount of variation in aquatic condition.

.Keywords: Benthic Index of Biotic Integrity (B-IBI); Landscape analysis; Land use planning; Vegetation patterns; Spatial regression; Watershed function

ASPEN, FIRE, AND REPRODUCTIVE ASSOCIATIONS WITH ITS SURVIVAL

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Abstract

A study by Tim Benedict titled, “Aspen Regeneration after 2000 Fires (2010) on the Bitterroot” first shed light that there were conditions, within our current set of environmental concerns that allows for the robust growth of aspen. The Bitterroot Range is an area not known for its aspen.

Here we investigate discernible differences between after fire and no-fire greenness in selected areas. Imagery from Landsat satellites was used to elucidate that distinct clearcut and fire areas in Timmins Canada had discernible differences visible in satellite data after four years. The association that we hope to make in future studies is that there is a link between sexual reproduction and greenness indicating that sexual reproduction is advantageous to long term survival. This study indicates that within acceptable assumptions that there is a detectable difference.

Key Words: Genet, Ramet, Sudden Aspen Decline.

ASSESSMENT OF THE DAYTIME AND NIGHTTIME THERMAL INFRARED DATA FOR URBAN MAPPING IN THE ATLANTA METROPOLITAN AREA

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Abstract

Urban environments are notoriously heterogeneous in their assemblage of surface material. Thus, high-resolution images are required for urban studies. This project examines the utility of a 10-m resolution thermal infrared (TIR) Airborne Terrestrial and Land Acquisition Sensor (ATLAS) data for land use and land cover mapping in the Atlanta metropolitan area. The objectives are to find the thermal signatures of the daytime and nighttime ATLAS data, and to evaluate the usefulness of the TIR data for land use and land cover classification. The land use/cover scheme was developed from a level II Anderson classification scheme, with some modification. We performed a principal component analysis to reduce the number of multi-band TIR data to fewer significant bands. Then the maximum likelihood supervised classification was applied and the overall accuracy was assessed. The results suggested that despite the high resolution of the ATLAS data, only generalized land use and land cover maps, with 6-7 classes, could be produced using a conventional computer-assisted per pixel classification approach. TIR data were more useful for land *cover* classification than for land *use* classification because of the similarities of thermal signatures in some land use classes.

Key words: urban mapping, thermal infrared data, remote sensing

BALANCING LOCALIZATION AND ACCESSIBILITY IN URBAN FOOD INITIATIVES

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Abstract

While sustainability is generally considered a desirable goal, what sustainability is and what kinds of outcomes emerge from it are much less certain. Despite this lack of clarity, sustainability is extremely important in shaping urban policy. I argue that to understand what sustainability can do, it is helpful to think of it as a process of ordering – of shaping the discourses and practices of urban government. This paper looks at the Homegrown Minneapolis program, a city initiative designed to build a local food economy in Minneapolis. There are two distinct visions that shape what Homegrown should be and should do – one arguing that it should focus on developing a local food economy, the other arguing that it should be a means through which issues of food access is addressed. This paper will explore how sustainability takes shape through the articulations and tensions that emerge between the two poles of the Homegrown program.

BLOOD GOLD

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Abstract

In a developing country like Nigeria mining of mineral resources is more a curse than a blessing. Inadequate mining policies, corruption in the public sector through bribery and embezzlement of public funds, lack of rigorous law enforcing, all lead to illegal trafficking in natural resources. The results are environmental degradation on a significant scale. Deforestation, soil erosion, radiation hazards, lead and heavy metal contamination of the soil and water have become the order of the day.

In villages across Northern Nigeria, illegal gold mining has caused immense damage to villagers' health due to lead and radiation contamination of the soil and water. In Zamfara state alone, more than 600 deaths of known cases have been reported and at least 4000 more were feared to be infected.

Where there is corruption, there is lack of political accountability, lack of respect for the rule of law and disrespect for property rights, minimal accountability, transparency and poor enforcement.

That is why as the government turned a blind eye to the lead poisoning and environmental degradation situation; non-governmental organizations such as Médecins Sans Frontières (MSF) and Human Right Watch are making effort to clean contaminated sites and cure infected children, the question that still remains is to what extent is the environment contaminated?

The aim of this study is to use remote sensing and GIS technology to map the temporal and spatial extent of environmental degradation and pollution by comparing information before and after the mining period in Zamfara and neighbouring villages. Also, factors such as house hold distribution and the distance of villages, streams, rivers and farms from mines will be determine in order to establish the safest distance for which people, plants and animals can live without being affected by lead or other heavy metal poisoning. Research Proposal by National Space Research and Development Agency, Abuja, Nigeria. Therefore, the study will aid policy makers to make more informed decisions in developing the mining sector; instituting strict environmental policies and enforcement in order to protect the mining areas, create sensitization and awareness as well as rehabilitation and also resettlement if possibly.

Keywords: Corruption, illegal mining, lead poisoning, remote sensing, GIS.

BREAKING THROUGH THE PROPRIETARY DATA WALL: TEACHING CHAIN-STORE SALES FORECASTING USING DATA FROM THE FIELD.

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Abstract

In North Carolina, all bottled liquor is sold from state owned and operated outlets known as ABC stores. Unlike most retail outlets, individual ABC store sales data are available to the public. The purpose of this study is to present a pedagogic strategy for students to develop, manipulate and understand geodemographic store sales models using actual chain-store sales data for large metropolitan areas in North Carolina. Store sales models are developed for outlets in Mecklenburg, Forsyth, Guilford, Durham, Wake, New Hanover and Buncombe Counties. This paper will illustrate student-driven trade area identification, collection and validation of trade area demographic data and the interpretation of sales models for metropolitan ABC store sales. The paper will also explore the pedagogic implications of a store sales model built for a set of uniform stores that lack direct competition. These conditions provide student's with an instrument to explore elements of store sales forecasting such as the role of local culture, management quality and site characteristics on sales.

BROWNFIELD REDEVELOPMENT AND PUBLIC-SECTOR SUPPORT: INSIGHTS AND SUGGESTIONS FROM DEVELOPERS IN MILWAUKEE, WISCONSIN

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Abstract

Public support for brownfield redevelopment is based on the assumption that it can be helpful in many cases and essential in others. Few studies have surveyed developers who received public-sector assistance for their insights. This case study collected the experiences and suggestions of developers who undertook brownfield redevelopments with public support in Milwaukee, Wisconsin. The paper conceptualizes the multi-faceted nature of brownfield development using three interrelated contexts: site specific, economic, and institutional. Developer suggestions for promoting more brownfield redevelopment included: 1) more public funding, 2) less bureaucracy/paperwork, and 3) the City taking a risk on a well-chosen catalyst site to help turn around an area in conjunction with long-term planning and public improvements.

Key words: brownfield redevelopment, public funding, developer insights

CHANGES IN EVAPOTRANSPIRATION AND CO₂ FLUX IN CENTRAL AMAZONIA

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Abstract

Micro-meteorological and stem sap flow measurements were repeated five times from 2009 to 2011 at a primary forest, a secondary forest, and a pasture in central Amazonia. Both the above-ground biomass and the evapotranspiration of individual trees were slightly larger at the primary forest than at the secondary forest. While the pasture was covered with grass during dry season, the evaporation was larger than the evapotranspiration at forests. However, after the livestock had eaten the grass, the evaporation fell below the evapotranspiration. The soil CO₂ flux was the pasture>the primary forest in dry season, showing that the change from forest to grass increased the emission of CO₂. At forests, the flux is absorbed as the increments of above-ground biomass, but at pastures it leads to a net increase of atmospheric CO₂. The cancellation of grazing expansion policies and conversion to secondary forests are important steps to stopping the drying and warming of Amazonia.

Keywords: Amazonia, pasture, evaporation, forest, evapotranspiration, CO₂ flux

CHANGING JOBS-HOUSING RELATIONSHIP IN BEIJING: AN EXCESS COMMUTING PERSPECTIVE

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Abstract

The spatial organization of jobs and housing is an important aspect of urban spatial structure. As the rapid urban transformation in China has drawn much scholarly attention, research has been done to study changing jobs-housing relationship in Chinese cities. This paper investigates the changing jobs-housing relationship from an excess commuting perspective. Using data collected from two surveys conducted in Beijing, we compute excess commuting of urban residents according to their residence and employment locations. The study finds that as urban expansion continues and more people live farther away from employment, the average commuting time increased by over four minutes during 2005-2010. While the overall level of excess commuting remains largely unchanged for the urban area as a whole, noticeable changes and variations are reported at sub-metro (i.e., district) level. We explain these patterns and changes in relation to the changes in the urban spatial structure, especially the changes in the urban transportation system and the shift in urban employment centers.

Keywords: jobs-housing relationship, excess commuting, urban structure, Beijing, China

CLIMATIC VARIABILITY AND CHANGING TRENDS IN AGRICULTURE IN WEST CENTRAL ALBERTA, CANADA.

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Abstract

Farmers in the region of west central Alberta have always faced challenges associated with environmental variability; rocky soils and short, variable growing seasons mean farmers have always had to deal with substantial amounts of uncertainty. Regardless, farmers have persevered in the region since the 1920s. Research conducted in the 1980s showed that perception and ideology played key roles in the coping strategies of this early generation of farmers and allowed them to persevere in the face of substantial environmental risk.

Recently completed research has identified significant changes in the agricultural strategies of subsequent generations of farmers in this region. This presentation examines these changes and considers the roles of environmental variability, technology and the global economy in the growth of specialty agriculture in this region.

Key words: climatic variability, agriculture, environment

COMMUNITY PERCEPTION OF TEXAS WATER REUSE PROGRAMS

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Abstract

As Texas's population is expected to reach approximately 46 million by 2060, water managers will need to find more sustainable water supplies to accommodate this increase. Overallocation of many of the state's rivers, as well as overpumping of aquifers, makes these resources less reliable for meeting growing water demands. For this reason, many decision-makers are turning toward creative water reuse initiatives to augment dwindling supplies, as water use for municipal purposes has already increased exponentially over the last several years.

This research focuses on Potter, Midland, Lubbock, and Collin counties since each report more than ten million gallons per day of municipal water supply reuse, according to the Texas Water Development Board. The first portion of this study examines similarities and differences between these counties to determine how each community incorporates reuse into their municipal water supply. Additionally, for a reuse project to be effective and successful, the local community must be onboard, and therefore should be included in the planning and implementation process. The second portion reports on the results of a survey of residents of these counties. We analyze and assess their perceptions regarding reuse to evaluate the extent to which they are willing to accept various reuse initiatives.

Results from this research will provide water managers insight into community perceptions regarding direct and indirect reuse options and provide a framework for establishing strong, community-backed wastewater reuse plans, within relevant local contexts.

Key words: wastewater reuse, water conservation

PRELIMINARY COMPARATIVE ANALYSIS OF GIS WORKFORCE EDUCATION: LINKING PRACTITIONERS WITH EDUCATORS

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Abstract

Preliminary results of a workforce educational needs assessment survey administered to GIS practitioners and college and university educators show strong similarities between what educators and practitioners consider to be the most important content. I administered an anonymous online survey listing twenty five topics designed to be representative of the subject matter likely to be found in college GIS courses and employed in the workplace. The survey had a branching structure that allowed both GIS practitioners and GIS educators to take the survey and to have the results compiled separately. Each question could be rated on a seven point Likert scale from one indicating extremely unimportant to seven indicating extremely important. Forty five practitioners and sixty five educators completed the survey.

Based on average Likert scores results showed the top three categories – “problem solving,” “spatial thinking,” and “presentation skills” -- were identified by both practitioners and educators thus indicating considerable convergent thinking on those educational aspects. Other highly rated aspects were those related to data such as input, data models, database development, metadata and other technical topics. In general, the average scores for all factors were similar between the groups, although their rankings did show some variation, depending on the topic. Interestingly, while “workforce culture” and “institutional design” received the lowest average scores, the practitioners’ results were considerably higher in the extremely important category than were the educators’ scores. A similar difference between practitioner and educator was evident regarding teamwork. This indicates that, while some of the institutional setting factors are less valued overall, they seem more important to the practitioner than to the educator. Although subtle, this difference might indicate the most important mismatch between what educators are teaching and what is needed in the workforce.

Key Words: GIS education, workforce development, GIS curriculum

COMPARING THE PHENOLOGY OF BURNED AND UNBURNED TALLGRASS PRAIRIE USING *IN SITU* SPECTROSCOPY

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Abstract

Field spectroscopy measurements were used to simulate various MODIS bands and indices that have been shown to successfully detect burned areas in various cover types in the literature. Each band or index was subjected to three ANOVA tests in order to determine its ability to differentiate between burned and unburned tracts of tallgrass prairie. All spectroscopy measurements were collected on several dates throughout the growing season (beginning in spring), which enabled the inclusion of a temporal element. This exposed the efficacy of each band or index to differentiate burned from unburned areas as the vegetation on both areas regrew. Several bands and indices, including NDVI, GEMI, GEMI-B, NBR, and MODIS band 7 (LMIR), showed very little utility for differentiating the areas for more than a few days after the burned area was burned. Others, including BAI, MIRBI, and MODIS bands 3 (red), 4 (NIR), 5 (LNIR), and 6 (SMIR) were able to differentiate between burned and unburned areas well into the growing season—in some cases even through the entire length of the sample until late summer. The performance of specific bands and indices often depended on grazing and other factors that influenced pre-burn biomass. Depending on the band or index in question, these findings both support and contradict those from other, non-tallgrass prairie cover types.

Key Words: field spectroscopy, burn mapping, phenology, MODIS, tallgrass prairie

CONNECTING WITH THE PEOPLE: DEVELOPING STRATEGIES TO CONVEY CLIMATE SCIENCE TO KANSAS STAKEHOLDERS

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Abstract

Challenges exist in sharing the knowledge of climate science in a political and social environment that reinforces a message of denial. While the scientific clarity of the anthropogenic climate change message continues to be strengthened, other confusing and denialist messages have made many central US citizens wary about the topic of human-induced climate change. Multiple conversations with Kansas stakeholders have helped identify knowledge frameworks that facilitate scientific communication about anthropogenic climate change. This paper presents the characteristics of an evolving set of ideas that convey a clear message of ongoing and strengthening anthropogenic climate change, which are based on communicating basic physics along with a bit of humor and that is designed for diverse and/or non-scholarly audiences.

Keywords: Anthropogenic climate change, science communication, denial, stakeholders

CONSULTANTSHIPS – GOING BEYOND CONVENTIONAL INTERNSHIPS

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Abstract

Internships are an integral part of the student's learning experience, especially for geography majors. At Texas State University, while maintaining traditional internships, the Government Partnerships Program (GPP) offers something more – an ongoing “consulting firm” approach to education in which students and staff, with faculty leadership, conduct applied research on campus for outside agencies while simultaneously fulfilling the university's community service responsibilities. Since its Closed Landfill Inventory project in 1998, the GPP has helped fulfill the needs of government agencies that commonly have budgetary and personnel limitations through outsourcing projects. Since then, the GPP has raised nearly \$11 million in grants/contracts. Being part of ongoing programs helps students transition from learners to employees and managers in their chosen field. The GPP model is applicable to other universities to bridge the gap from traditional geographic studies to helping policy-makers, agencies, and firms make well-informed decisions, thus applying geographic skills to societal needs.

Keywords: funded internships, applied geography, consulting

DATA AVAILABILITY AND TOBLER'S FIRST LAW OF GEOGRAPHY: AN APPLICATION OF NEURAL NETWORKS TO SPATIAL RETAIL DATA

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Abstract

Publicly available retail data, such as the data provided by the California Board of Equalization, provides a quite detailed portrait of county and city level retail activity by type of retail outlet. It has, however, two major drawbacks - it is only available with long time-delay and, due to the choice of geography by the provider, large and small retail areas are represented with the same level of detail. Both factors render it of limited use for policy analysis. This paper proposes an approximation procedure that aims to overcome those two weaknesses with a three-step procedure, employing both Ordinary Least Squares (OLS) regression analysis and Multilayer Perceptron Neural Networks. We validate the procedure by using geographically higher aggregate data and find that relatively simply structured Multilayer Perceptron Neural Network Estimators outperform linear regression models due to the non-linear components of spatial dependencies, that is, the application of the first law of geography. Based on our findings, we argue that approximation of data for smaller geographies both in the cross-section and over time deserves closer investigation.

Key words: retail, data availability, Tobler's First Law of Geography

DELIVERY OF ECOSYSTEM SERVICES IN A CHANGED ENVIRONMENT: APPLICATION IN THE BLACK HILLS ECOREGION

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Abstract

According to the Millennium Ecosystem Assessment, approximately 60 percent of global ecosystem services have been degraded or used unsustainably over the past 50 years due to land use choices and human activities. This study investigates the implications of past land cover changes on ecosystem services supplied by the landscape at a regional scale. For each coupled ecosystem service/land cover class, a level of production of ecosystem service is assigned in order to estimate the contribution of each land cover class to the delivery of ecosystem services. The evolution of the potential supply of ecosystem services by the landscape over time reflects the direct impact of land cover conversion on ecosystem services production. This methodology, which constitutes a new approach in ecosystem services quantification, is illustrated in a case study of Black Hills land cover changes between 1992 and 2006.

Key words: Ecosystem services; Land cover changes; Land management.

DERIVING MEASUREMENT ENDPOINTS USING MODERATE RESOLUTION SENSORS: MEETING THE MONITORING CHALLENGE FOR ECOLOGICAL RISK ASSESSMENT

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Abstract

Ecological risk assessment evaluates the potential adverse effects that human activities have on the components that comprise an ecosystem. When conducted within a well defined geographic location, the ecological risk assessment process can be used to identify vulnerable and valued resources, and link human activities with their potential effects. The risk assessment process also provides an important mechanism to acquire and organize scientific data to support informed environmental decisions. In this paper the endpoint question is examined and the capabilities of earth observational satellites as a means to measure and monitor ecological endpoints for risk assessment is appraised. With the goal of exploring the feasibility of deriving generic endpoints from moderate resolution sensors, this paper examines the endpoint issue using hydraulic fracturing activities in the Marcellus and Utica Shales as the risk propagator and the Normalized Difference Moisture Index (NDMI), Fragmentation Index, Fractal Dimension and Fractional Abundance as candidate assessment metrics. The methodology crafted for this study suggests an approach to support compliance inspections using generic measurement endpoints, and demonstrates the feasibility applying earth observational satellites for monitoring the potential adverse impacts of activities known to damage environmental systems across extended time horizons.

DESIGNING CLICKER QUESTIONS TO PROMOTE HIGH-LEVEL GEOGRAPHIC LEARNING

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Abstract

Regarded as one of the most promising innovations for transforming traditional passive classrooms to more active learning and formative assessment environments, the Classroom Response System (or simply “clicker”) technology is now used widely by instructors in college teaching. With clicker technology, an instructor first poses a question; each student then responds to it with a handheld transmitter (clicker) or other device; the software in the instructor’s computer immediately displays student answers with a distribution graph for evaluation.

Clearly, the centerpiece of using clicker in the classroom, besides the technological part, is the questions posted to students. A clicker question is mostly in the multiple-choice form. Many educators consider the multiple-choice question (MCQ) format as the most flexible and effective method in assessing student learning. If designed properly, a MCQ assesses student learning at different cognitive levels. In Bloom’s taxonomy, these cognitive levels, from lowest to highest, are knowledge recall, comprehensive understanding, problem-solving application, creative synthesis, and critical evaluation. But not all MCQs are created equal. Most MCQs in question banks that come with college Geography textbooks, for example, rest at the low-end of Bloom’s model. Although simple knowledge recall questions have their purpose, it is also important to have MCQs to promote students’ higher-level learning. This presentation demonstrates that with careful design, MCQs can function well to promote deeper learning in Geography classrooms using clickers.

Key words: geographic education, clicker, Bloom’s taxonomy

DEVELOPMENT OF A GIS INTERNSHIP PROGRAM

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Abstract

An academic internship is a vital component to college students' careers. In recent years, it is becoming more important in the United States and other countries due to the state of the current economy. However, a geography program in a small urban area often has little access to the internship opportunity because of limited external supports. Businesses and organizations in small cities tend to have a difficulty in hiring interns due to cost or distant location. For these reasons, a unique structured internship program in collaboration with city officials was developed. This paper demonstrates how we successfully developed and maintained a GIS internship program. Students worked on projects using various resources at school instead of commuting to internship sites while employers and faculty together closely supervised, trained, and assessed interns' work progress. Although our GIS internship program differs from a traditional internship program in these respects, our records revealed that it also significantly benefited our geography and non-geography students in preparing for employment.

Key words: GIS, internship program, geography education,

DEVELOPMENT OF HEALTH DENSITY INDICATORS FOR SOUTH AFRICA USING GIS

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Abstract

The scope and emphasis of a public health program are necessarily influenced by the changing characteristics of the population it serves. In South Africa, population growth between 2004 and 2009 has outstripped the availability of health facilities. GIS provides ideal platforms for decision makers to easily visualize problems in relation to existing health services as well as distribution of health facilities and their surrounding populations. Therefore this research was aimed at developing health density indicators in South Africa at a sub-provincial level using GIS in order for decision makers to target appropriate populations and areas for intervention. This research used the existing (5043) public health facilities data (2010) together with some additional data from the Department of Health and Stats SA Community Survey 2007 population estimates at municipality level to develop two health facilities density indicators. The first indicator, health facilities per population, was calculated by dividing the number of health facilities by the total population (per 10 000) at a municipal level. The second indicator was calculated by dividing the number of health facilities by square kilometre (1 000 km²). Findings showed that most municipalities that had a low coverage in terms of the number of health facilities per 10 000 population are located in the eastern part of the country as well as in urban areas even though there are more health facilities in these urban areas as the total population is also much higher due to migration. Results also indicated that the density indicator per 1000 km² is useful for large areas so that the distribution do not get skewed by the size of a municipality. Therefore, the combination of the two indicators is of high importance in final decision making in prioritizing areas for health care interventions for large municipalities characterized with low populations.

Keywords

South Africa, GIS, health facilities, population, indicators

DRIVING DECISIONS: THE USE OF GIS BY RETAIL ORGANIZATIONS IN CANADA

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Abstract

Retail location decisions typically involve substantial levels of capital investment and risk. Once made a company has to live with the consequences of their location decision making activities. This paper provides the report findings from a comprehensive survey of decision support amongst a large cross-section of major retail and service companies in Canada. The study builds on research undertaken over a decade ago and provides a longitudinal perspective on how retail location decision support has changed over time. The findings from the online survey and follow-up interviews with decision makers highlight the widespread adoption of GIS amongst major Canadian businesses and the broad array of datasets and techniques used to support location decisions. The research highlights on-going challenges in terms of the integration of GIS within the final corporate 'decisional' outcomes - raising many questions as to the 'role' of GIS within decision making. While GIS has become increasingly procedurally embedded within decision processes the survey respondents' note challenges in terms of using GIS to strategically drive decisions. Instead, experience, intuition and gut-feel, what can be termed the art of decision making, remains a key driving force over the science of GIS and data and model- driven approaches. This in turn prompts concerns over the development, management and retention of organizational knowledge and corporate geospatial intelligence.

Keywords: GIS, retail, location decision-making

ECOLOGICAL FACTORS THAT DETERMINE THE LOCATIONS OF GANG AND NON-GANG RESIDENCE, ALBUQUERQUE, NM 1996-2006

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Abstract

We use spatial statistical techniques to analyze neighborhood characteristics of residential locations of gang and non-gang violent crime offenders in Albuquerque, NM from 1996 through 2006. Only recently have crime researchers investigated gang activity using quantitative and spatial approaches. The spatial nature of gang residence and crime, however, suggest that geographical analysis might provide insights into differences between gang and non-gang offenders. We use data from Bernalillo County Police Department to identify violent offenders and GangNet to separate known gang members from other offenders and identify their residential locations. We use both spatial and non-spatial techniques to identify the ecological factors that differentiate the characteristics of neighborhoods where gang and non-gang offenders reside. The results indicate that gang and non-gang violent offenders reside in distinctly different neighborhoods. Surprisingly, gang offenders were more likely to live in neighborhoods that demonstrate residential stability. These findings have potential implications for justice and law enforcement policy.

Key words: Gangs, violent crime, spatial regression, residential patterns

EDUCATIONAL TRAINING OF STORM SPOTTERS AND CHASERS IN RELATION TO GEOGRAPHICAL DISPERSION ACROSS THE UNITED STATES

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Abstract

The science of storm spotting is still coming into fruition primarily due to technologic advancements in mobility and speed. While technology improves, there remain areas that lag behind. One frustration is the range and geographic dispersion of spotters/chasers throughout the United States. It is hypothesized that storm spotters/chasers who hold a degree in atmospheric science or meteorology are more willing to travel longer distances across the United States to locate and chase severe storms than spotters/chasers that have gained their education through organizations like Skywarn, SpotterNetwork, etc. The purpose of this research is to study the distribution and movement of these storm spotters/chasers and examine if their level of education influences his or her geographic spotting or chasing area. Data collected from on-line and field questionnaires shed light on how the different approaches to training storm spotters/chasers has affected their geographic dispersion during severe weather outbreaks.

EMPLOYMENT IN TRADITIONAL CENTRAL BUSINESS DISTRICTS, 1970-2010

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Kevin Hawley (Geography Division, US Census Bureau)

Abstract

Though employment has dispersed throughout metropolitan statistical areas in recent years, central business districts (CBDs) continue to be the largest concentration of employment in most metropolitan areas. The Census Bureau has used census tracts to delineate CBDs as far back as the 1950s, but has not provided an official definition for CBDs since the 1982 economic census. Nonetheless, the 1982 census definition remains useful, because in most cases, it identified the traditional employment center in metropolitan labor markets. However, this definition delineated CBDs for all cities of 50,000 or more, and in many cases included places that were not traditional employment centers. This research first restricts the definition of CBDs to include only those associated with metropolitan “central cities” and then identifies comparable CBDs for the 1970 and 1990-2010 censuses. Finally, place-of-work microdata are used to examine changes in employment and workforce composition for CBDs over the past several decades.

Keywords: central business district, metropolitan, employment

ENVIRONMENTAL CONTROLS ON THE DISTRIBUTION AND VIGOR OF AN ENDANGERED GRASS (*PANICUM ABSCISSUM* SWALLEN)

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Abstract

Panicum abscissum Swallen, commonly called cutthroat grass, is an endangered Florida endemic species. It occurs dominantly on seepage slopes in central Florida and in some small isolated areas adjacent to seasonal ponds. Historically, cutthroat grass had a larger range, but agricultural development and fire exclusion have reduced its range to five counties, and there are currently only 54 confirmed occurrences of cutthroat grass. Some prior research exists on how fire exclusion affects the species, but little other information is available about cutthroat grass communities and factors that influence the occurrence and health of the species. The most southern known occurrences of the species are on two Palm Beach County natural areas, which are managed for the preservation of native habitats. We present our preliminary investigation of how various factors, such as soil type, soil conditions, water table fluctuations, and canopy cover, influence the occurrence and vigor of the cutthroat grass on these Palm Beach County natural areas.

ESTABLISHING POST-FOREST FIRE VEGETATION SUCCESSION PATTERNS ON SOFA MOUNTAIN, WATERTON LAKES NATIONAL PARK, CANADA

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Abstract

Understanding vegetation response to disturbance on complex topography is important to land managers, particularly those in fire-prone mountain regions of North America. Appreciating the possible spatial and temporal response of forest recovery post-natural forest fires and prescribed burns can assist land-use planners, ecologists, and park officials in planning and managing conservation strategies in natural landscapes. In recent years, national park managers in both the United States and Canada have recognized the important regenerative properties of fire as a tool in maintaining ecological integrity. This paper offers the initial findings of the successional growth over the last fourteen years of the Sofa Mountain fire of 1998. Findings presented include current and emergent vegetation types, and spatial distribution of the forest mosaic, particularly as associated with topography.

Establishing the current and emerging mosaic was accomplished through the use of remote sensing and GIS software; additionally ground truthing was conducted to establish a vegetation classification of the burn area delineating land cover patterns. Statistical regression analysis indicates that some vegetative groupings were influenced by specific topographic features, most notably the aspect r-value, which was negatively correlated with tree emergence. Slope was the only topographic factor determined to influence the survival of tree patches through a weak negative correlation between slope and surviving trees. Results are consistent with comparable post-fire areas in other mountain regions and can be utilized to update previously created vegetation classifications.

Key Words: Forest Fire, Vegetation Succession, National Park, Planning

FLOOD DAMAGE ASSESSMENT USING REMOTE SENSING, GIS AND GPS TECHNOLOGIES, CASE STUDY: GORGAN PROVINCE, NORTH-EASTERN PART IRAN

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Abstract

Several attempts have been made to mitigate or reduce damages caused by natural disasters. Successful applications of remote sensing, GIS and GPS technologies to map and monitor such disasters like floods, earthquakes, droughts, landslides have made hopes to mankind. In this research, an attempt has been made to study the 2000 and 2001 flood prone areas of Gorgan province, North-Eastern part of Iran using remote sensing GIS and GPS technologies. TM, ETM and IRS images of study area were registered on digital land use land cover map. On the basis of a fuzzy logic algorithm, a change/unchanged map was created. Based on ground truth investigation and local expertise knowledge, boundaries of flooded areas were digitized in image processing software and transferred to GIS environment. The boundaries of flooded areas observed to be the same for both dates. Roads, villages and land use/land cover categories that were affected by flood were clipped out. Statistics generated from this study show that more than 7500 ha of different land use land cover were affected during these floods.

Nearly 30 villages were within a 500-hundred meters buffer zone of the flooded area and 47 km of the roads were destroyed. Statistics derived from such studies could be useful to agricultural management officials and private insurance companies. Necessary cautions, proper and further management should be followed for the affected areas in this part of the world.

Key words: flood, remote sensing and GIS, Gorgan province.

FLOODING DOWNSTREAM OF FLOOD CONTROL DAMS IN SAN MARCOS, TX

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Abstract

Central Texas along the Balcones Escarpment is among the most flood prone regions of the United States that has led to its reputation as “Flash Flood Alley.” After devastating floods in 1921, 1929, 1970 and 1981, five U.S. Soil Conservation Service flood control dams were constructed on the ephemeral headwaters streams of the San Marcos River upstream of San Marcos, TX. These dams have been able to contain all floods since 1991 with the exception of the October 1998 flood that was produced by 16 inches of precipitation in 24 hours. Unfortunately, several of the bridges that cross the downstream sections of those tributaries are regularly closed because inadequately sized culverts cannot convey the releases from the dams plus local downstream runoff. One neighborhood of 1250 homes is cut off from emergency services nearly annually because of the closing of a crossing over a tributary of the San Marcos River. Downstream of another flood dam the failure to improve the channel to convey controlled releases from the dam plus local runoff has put a number of residences at risk.

In this study we analyze the capacities of three stream crossings and the capacity of the channels downstream to assess their capacities in terms of the expected recurrence intervals. We employed the USGS Slope-Area method to determine channel capacities and utilized the Hazen -Williams Equation to determine culvert flow capacities. Our calculations suggest that one bridge on Sink Creek is inadequate to convey even the 2-year event and that significant channel improvements need to be made to prevent flooding losses along Purgatory Creek downstream of the Hunter Road crossing from floods larger than the two year event.

Key words: flood control, Texas floods, natural hazards

FOOD DESERTS AND MINORITY POPULATION IN AKRON, OHIO

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ABSTRACT

The concept of *food desert* is becoming important in the United States and other developed countries. Academics, policy makers, and community groups use this term to identify populated urban and rural areas where residents do not have access to healthy diets. Issues concerning how people consume food in developed countries are not just about supply, demand, or distribution. Rather, the recent focus in developed countries has been on what types of food and the quality of food people consume. Public health literature suggests that the price and accessibility of fresh food may be an important factor along with neighborhood environment and residents' diet quality when considering the issue of, for example, obesity. With access only to unhealthy food choices in neighborhoods that lack access to healthy food, or food deserts, residents may face negative changes in their diets. These changes may lead to obesity and other related health problems such as heart attacks, high blood pressure, high cholesterol, diabetes, and a suit of related chronic health issues. High rates of obesity are usually found in neighborhoods with the lowest incomes and with the lowest education level.

The method developed for the identification of a food desert will be based on those reported in the literature plus modifications needed for the study area. The implementation of the method will provide a basis to compare their outcome with these reported in other studies. The comparison will facilitate a discussion that may lead to further exploring the inclusion and weighting of various socio-economic characteristics of neighborhoods for future studies. GIS techniques such as, network analysis closest facility and geographically weighted regression are used in this study to detect and explore the area of food desert as well as making comparison between different ethnic groups.

FOOD DESERTS AND THE HEALTHY CITY: BRINGING PRACTICE INTO METRICS OF FOOD ACCESSIBILITY

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Abstract

Spurred by concern over rising rates of obesity and poor food access, many U.S. cities have created initiatives to remedy what are often called “food deserts.” Generally defined as communities in which healthy foods are either absent or unaffordable, food deserts have most often been identified through a spatial analysis of the distance to and density of large food retail stores in a given area. This presentation reviews this research and suggests alternative metrics of food access more firmly rooted in the practices of individuals within low income communities. This approach acknowledges multiple rationalities of good food and contextualizes food procurement within the context of individuals’ daily mobilities and social positions. By combining broad scale data on food stamp utilization and case studies of individual food diaries from Minneapolis and St. Paul, this study seeks a more inclusive definition of what a healthier and more sustainable urban food system might look like.

Keywords: food deserts, GIS, health geography, alternative food systems, practice

FORECASTING BICYCLING RISK FACTORS WITHIN NEIGHBORHOODS: A SPATIAL AUTOREGRESSIVE APPROACH

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Abstract

Bicycling is a popular mode of travel that can help reach sustainable transportation goals by alleviating externalities associated with automobile dependency. However, safety concerns remain a primary impediment for bicyclists and non-bicyclists alike. This study builds on prior bicyclist crash risk analysis by estimating bicycling risk factors within neighborhoods—emphasizing on contextual and socio-demographic factors that may affect bicyclist safety. The approach used here has the direct benefit of addressing neighborhood planning goals and simultaneously highlighting underreported bicycling risk factors. Geographic Information Science (GIS) and a spatial auto-regression model (SAR) were used to determine influential factors contributing to elevated neighborhood bicyclist crash rates. It was found that when spatial bias is accounted for, model robustness significantly increased ($R^2=.62$) over a non-spatial model. Significant bicycle crash risk factors include gender, household density, commercial land-use, building type, and housing occupancy. The results underscore the importance of how neighborhood composition affects bicycling safety.

Keywords: bicycling, neighborhood, GIS, spatial auto-regression, crash analysis, safety

FREI GODINHO AGRICULTURAL SETTLEMENT, PERNAMBUCO, BRAZIL: THE SUSTAINABILITY OF A LIVING ALTERNATIVE TO SUGAR MONOCULTURE

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Abstract

For almost 500 years, the Northeastern sugar zone has been the engine of Brazil's economy. So important are its plantations to the national culture that Gilberto Freyre has called the region the cradle of the Brazilian people. However, the sugar zone has also been the world's number one destination of African slaves and has replaced the splendid Atlantic Forest. More recently, workers have suffered low wages and low rates of land ownership, and the plantations' Green Revolution methods have polluted waterways. Since 1994, the Frei Godinho agricultural settlement, connected with Brazil's landless peasants' movement, has been a living alternative to sugar monoculture. In the heart of the sugar zone of Pernambuco, the settlement sells soursop, a tropical fruit, for distribution to the children in the cafeterias of a nearby metropolitan school system. The settlement also cultivates a variety of other tree crops as well as sugar, and there are two manioc mills and a small dairy operation on the property. Based on Summer 2012 fieldwork using interviews with settlers and an ethnobotanical survey of household gardens, my paper will assess the long-term economic and ecological sustainability of the settlers' livelihoods.

GIS VEHICLE ROUTING FOR SUSTAINABLE WASTE COLLECTION IN THE CITY OF ALTOONA, PENNSYLVANIA

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Abstract

Depending on the day of the week, residents of the City of Altoona, Pennsylvania (USA) experience between 10 to 15 garbage and recycling trucks driving through their neighborhoods collecting trash and recyclables. This system, or lack thereof, is the result of the city not having a contracted waste hauler. Thus, residents are able to freely choose their own waste hauler. While this allows residents freedom of choice, it exemplifies the utmost disregard for the environment and sustainability. This meaningless increase in truck traffic results in road degradation, increased vehicle emissions, and noise pollution. This process is even more inefficient when one considers that waste haulers are generally clueless about routing strategies. Few, perhaps none, have scientifically approached the issue and systematically derived a route that minimizes mileage, intersection crossing, and traffic congestion. As recent as 2006, the City of Altoona attempted to contract one or several waste haulers but resident's stated their freedom to choose. City Council promptly folded and residents are still free to choose from any of the 15 to 18 waste collectors operating within the city.

This purpose of this research is to apply GIS to waste collection in the City of Altoona. A combination of census and parcel data was used in combination with ESRI's StreetMap to 1.) determine the number of waste haulers needed to service the city and 2.) develop optimal routing strategies for waste haulers to use as they collect residential waste and travel to and from transfer stations. Results from this research demonstrate that the efficiency of waste collection in the city can be greatly improved.

Key Words: GIS, routing, waste collection, trash collection

GPS, GIS AND THE DIGITAL DIVIDE: GEOGRAPHY'S PLACE WITHIN SUB-SAHARAN AFRICAN POVERTY STUDIES

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Abstract

The world's ability to access and use digital information and technology has increased with intensity over the past decade, demonstrated by Africa's growth of internet use of almost 3000% (Internet World Stats). While geographical research has demonstrated the ability of GPS, GIS and remote sensing in understanding poverty, the capability of spatial and temporal data to explain the cause and effect of natural and human forces on the poor is in its infancy. This paper reviews recent geospatial research in the context of poverty studies in Sub-Saharan Africa. Using a case study of current research on women's mobility and time use in rural Africa using GPS and GIS, this paper will demonstrate the ability of participatory technology to provide new insight into poverty in Sub-Saharan Africa. In conclusion, this study explores future uses of geographic technology in understanding the place and space of poverty.

HISTORICAL FLOODPLAIN SEDIMENTATION ALONG THE UPPER MISSISSIPPI RIVER, POOL 11

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Abstract

Many of the ecologically important aquatic habitats on the upper Mississippi River are being degraded due to rapid sedimentation. Sub-aqueous sediment cores were collected from two backwater lakes, one with a hydraulic connection to the main channel of the upper Mississippi River and the other with no low water connection to the main channel. Particle size, organic matter, carbonate, bulk density, and radiometric analyses were combined with river stage data to provide a detailed history of sedimentation rates and processes in each lake. Estimated rates of sedimentation for the 1938-2008 post-lock and dam period range from 0.8-1.0 cm/yr in the backwater lakes. While the rates are lower than those found in many previous studies of upper Mississippi River backwaters, these rates of sedimentation are an order of magnitude greater than pre-European-American settlement rates. If post-1963 rates of deposition continue, the backwaters are predicted to fill in to the water surface found under flat pool conditions in less than 100 years. Large overbank floods contribute the majority of the sediment to the isolated backwater and a large percentage of sediment to the contiguous backwater. Terrestrial floodplain surveying and sediment sampling indicate small to moderate sized floods are also an important factors in floodplain evolution by delivering large quantities of sediment to backwaters on a near annual basis.

Key words: Mississippi River, sedimentation, backwaters, locks and dams, geomorphology

IMPACT OF NEIGHBORHOOD CHARACTERISTICS ON STANDARDIZED MORTALITY RATE

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Abstract

It is known that mortality rate is affected by socioeconomic characteristics of neighborhoods, such as income, age, gender, and education. However, few studies have examined whether mortality rates in Korea are explained not only by socioeconomic characteristics, but also neighborhood built environments and community participation. This study categorizes neighborhood characteristics as socioeconomic characteristics, urban built environments, and social capital in neighborhoods, and analyzes how each would affect mortality rates. In order to control for mortality rates at different ages and determine spatial patterns in mortality rates among neighborhoods, this study uses a standardized mortality rate. This research seeks to explain what kind of neighborhood characteristics affect standardized mortality rates and the spatial disparity among neighborhoods. It focuses on the metropolitan area in Seoul, South Korea, including 60 administrative units. It employs factor analysis to categorize elements of the socio-physical environment since some urban amenities adequately symbolize the socioeconomic status of a given neighborhood. With factors extracted from the factor analysis, the analysis applies spatial linear regression. The standardized mortality rates show a clear spatial pattern; there is spatial clustering of high mortality areas. The results show that a neighborhood's socioeconomic status, walkability, residential vulnerability, and social capital have a statistically significant influence on standardized mortality rates.

Key Words: neighborhood characteristics, standardized mortality rate, factor analysis, spatial regression

IMPACT OF URBAN CONSTRUCTIONS WEIGHT ON INSTABILITY, CASE STUDY (DISTRICT 1 OF REGION 2 MUNICIPALITY OF TEHRAN)

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Abstract

Geomorphological developed subjects concerning urban studies during past half century are different. Analysis of landsides vulnerability in the hillside of mountains, and the study of changes of surface drainage channels and their relations to urban developments, are some of these issues. This paper which is based upon analytical method and its main tool is GIS software, tries to investigate the effect of urban constructions weight as effective factor on the accuracy of slide movements and surface instability creation in district 1 of region 2 of Tehran municipality. First, geographic coordinates and height of 100 unstable points were collected. Weights of buildings materials were used to calculate total weights of buildings in study area. By overlaying the map of unstable points and weight distribution in five weight categories (from very light to heavy), it is concluded that 53 % of unstable points are in areas were heavy and new buildings are situated and remaining 47 % are within light weight building areas. Furthermore, most of the observed points were in old urban texture.

Key words: instability, urban weight, old urban texture.

IMPROVING ACCURACY OF TRAFFIC POLLUTION ESTIMATES FOR HEALTH ANALYSIS USING COMMONLY AVAILABLE ROAD NETWORK AND CENSUS DATA

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Abstract

Usefulness of a statistical model relates directly to how accurately statistical variables represent real-world phenomena. When analyzing the associations of health outcomes and traffic pollution, there are three tiers of traffic pollution data, with the highest quality data (i.e. air monitoring devices and traffic volume counts) often prohibited due to cost or lack of area availability. However, analyzing health-pollution associations remains necessary, whether or not high quality data are available. Geographic road networks – commonly available data, yet least representative of traffic pollution – are frequently used in analysis by measuring either exact or arbitrary distances of the nearest road to a patient’s place of residence.

We propose improved alternative traffic variables, which employ widely available road network and community population data. These variables are compared to commonly used variables including distance from road to home, traffic volume counts, and pollutant values measured with air monitoring devices.

Key words: traffic pollution, air pollution modelin

INFLUX OF ASIAN INDIANS LEADS TO RAPIDLY CHANGING QUEENS' LANDSCAPES IN PAST DECADE THAT CONTINUES

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Abstract

Asian Indians are among the fastest growing foreign-born populations in the United States in recent decades. While research has demonstrated their near “invisibility” in many parts of the nation, no where are they more visible than in the borough of Queens, New York City. Little India in Jackson Heights is a well developed business enclave that has attracted large numbers of Asian Indians for decades. More recently, other places, such as Richmond Heights and Queens Village have experienced an influx of this ethnic group. This paper illustrates the nature and locations of recent growth in Queens and illustrates landscape changes that have led to ethnic tensions in particular villages within Queens. These tensions have led to political and legal clashes that remain active in Queens.

INTRODUCING THE COMMON CORE: GEOGRAPHY EDUCATION IN THE 21ST CENTURY

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Abstract

As the education in the United States moves solidly into the 21st Century, business, community and government leaders attempted to strengthen geography's role in the K-12 public schools through the Partnership for 21st Century Skills (P21Skills) and the Common Core State Standards Initiative (CCSI or Common Core). In 2010, states began adopting Common Core standards for English/Language Arts (ELA) and mathematics. To date, forty-six states have joined one of two consortia to assess student mastery of the standards (starting in 2014-15). Social studies, including geography, was included as part of the ELA framework as an appendix. What does this mean for the future of geography education at the state level? As new standards specific to geography are released, how can geography position itself to be part of the "rigorous, college- and career-ready standards" championed by the CCSI and P21Skills.

IS THERE RACIAL BIAS IN U.S. MARIJUANA LAW ENFORCEMENT? YES, NO, AND MAYBE

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Abstract

Cannabis sativa, source of the psychoactive drug marijuana, has been essentially prohibited in the United States since 1937. Marijuana possession arrests increased significantly after the 1972 start of the “War on Drugs”, a politically motivated law-enforcement effort ostensibly to reduce public harms generated by illegal drugs.

Many scholars have argued that U.S. marijuana law enforcement is racially biased against minorities. Various studies suggest that local politics, not national policies, are the source of any racial bias, which is notoriously difficult to identify in arrests data.

Data on marijuana arrests have not been analyzed geographically, although the data are inherently geographic. We present several cartographic analyses of law-enforcement data showing that African-Americans experience arrest rates far above average, at national to local scales in most regions. Few factors other than racial bias can conceivably account for the observed pattern. However, county-level political party dominance does not correlate to racial variation in marijuana arrests in our case study of Texas, which has the country’s highest arrest rates. Our negative result shows that other spatial variables must be tested to account for the seemingly systemic racial bias in marijuana law enforcement.

KNOWLEDGE AND INFLUENCE NETWORKS: DO BOARD MEMBERSHIP CHOICES CONTRIBUTE TO BUSINESS GROWTH AND DECLINE?

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Abstract

This study examines the development of Canadian business by examining the connection between firm-level growth and decline and elite knowledge and influence connections that Canadian businesses use to link themselves to other corporations and cities nationally and globally. The research focuses on the inter-city linkages embodied in the boards of directors of Canada's leading corporations. Some corporations cast a wide net in bringing in a broad range of people and associated perspectives to their boards, while others invite a very limited selection of board members and backgrounds. This study finds that board member selection practices among Canadian firms can be linked directly to business growth and decline. Benchmarking board composition against firm expansion and decline in terms of inflation-adjusted annual revenue change over the 1991 to 2006 period, this study shows that growing firms are associated with directors from a much broader range of national and international cities than firms that experienced decline. Firm growth in Canada thus appears to be connected with boards encompassing diverse members from national and international locations, while firm decline appears to be associated with boards including more local and regional members. This finding has implications for business strategy and regional economic development initiatives.

Key words: firm growth, firm decline, corporate directors, economic geography.

LAND COVER CLASSIFICATION USING AERIAL PHOTOGRAPHS AND LIDAR DATA FOR POOL 5 OF THE MISSISSIPPI RIVER

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Abstract

An object-oriented feature extraction approach is investigated for identifying wetland land cover/use classes for the Lake Odessa area of Pools 5 of the Upper Mississippi River. A computer-derived LCU database of the pool was created and assessed for accuracy based on manual photo-interpretation. Feature Analyst software under the ArcGIS software platform was used to classify LCU types using 1-meter true color aerial imagery along with LIDAR data. All LCU classes correspond to the Long Term Resource Monitoring Program General Wetland Vegetation Classification System. These LCU types were also classified manually using the same sets of photography. Differences in the area of cover for each LCU class was examined spatially and statistically. Ultimately, it is hoped that these results will provide a foundation for the future on which to base larger, more comprehensive mapping efforts that will aid in resource management.

Key words: feature extraction, aerial photographs, LIDAR vegetation mapping

LANDSCAPES OF MOVEMENT IN AMAZONIA: NEW DATA FROM ANCIENT SETTLEMENTS IN THE MIDDLE AND LOWER AMAZON

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Abstract

Ancient built landscapes including roads, earthworks, and patches of fertile anthrosols have been documented in several areas of the South American lowlands representing landscape capital that is often utilized by succeeding generations. Recent research is uncovering substantial human modified landscapes in the vicinity of ancient settlements in the Middle and Lower Amazon. Anthropogenic landscape features indicate routes of human movement within settlements and between settlements and local resources. Formation of anthrosols known as terra preta is patterned around habitation areas, public areas, and routes of movement.

This research investigates topographic features and anthrosols to learn how their patterning on the landscape indicates the structure, use of space, and resource use in ancient settlements. Archaeological excavations and mapping show the relationship of settlements, anthrosols, routes of movement, and natural resources. Results demonstrate substantially modified human landscapes with features that have permanently transformed what is too often considered pristine nature in Amazonia.

Keywords: ancient roads, anthrosols, built landscape, historical ecology

LIFE, LIBERTY, AND THE PURSUIT OF HEALTH: THE BIOPOLITICS OF HEALTHY CITY DESIGN

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Abstract

A powerful movement has emerged to design and build cities that govern “healthy” citizen behavior. The City of New York released *Active City Guidelines* in 2010 to promote health and daily physical activity through urban design, such as developing attractive streetscapes for pedestrians and cyclists. The manual also endorses synergies with sustainability, in which active living design strategies tend to reduce energy consumption and pollution. These measures have been widely adopted by urban regions to create more salubrious conditions for both citizens and the natural environment. The healthy city movement reflects a powerful growing capacity to manage and modulate everyday life. A complex network of social, political, and economic structures governs citizens by shaping the ways they understand and enact their own freedom and urban lifestyle. Cultivating health through active living design constitutes a novel form of authority and expertise, and a rapidly expanding territory for bioeconomic exploitation.

LOW-INCOME HOUSING AND SOCIOECONOMIC CHANGE IN METROPOLITAN AMERICA

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Abstract

A goal of America's largest affordable housing production program, the federal Low-Income Housing Tax Credit (LIHTC), is to deconcentrate poverty by providing low-income renters access to more affluent neighborhoods. However, the Qualified Census Tract (QCT) provision of the program incentivizes developers to build in high-poverty areas. This study analyzes the impact of the QCT provision on socioeconomic conditions in the twenty most populated metropolitan statistical areas (MSAs) in the United States. Using a socioeconomic index created from poverty-related variables for the time period between 1990 and 2005-2009, the findings of the research indicate that LIHTC development is not necessarily perpetuating poverty or deteriorating existing socioeconomic conditions in QCTs. In fact, distressed census tracts with LIHTC housing outperformed distressed census tracts with no LIHTC housing in the socioeconomic index when all twenty MSAs were considered in the aggregate and for the majority of the individual MSAs.

Key words: Low-Income Housing Tax Credit (LIHTC) program, socioeconomic index, Qualified Census Tracts (QCTs)

MAPPING FOOD DESERTS WITHIN THE BALTIMORE METROPOLITAN REGION

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Abstract

Available access to healthy and nutritious foods and grocers is a growing problem in the United States. Known as “Food Deserts”, these are areas with limited access to nutritious and healthy food. Through use of geographic information systems (GIS) and data provided by the US Census Bureau, this paper aims to identify the geographic location, extent, and change of “Food Deserts” in the Baltimore Metropolitan Region. Results indicate that more than nine percent of the population in the area lived in the food deserts in 2000 and 2010. Although the total number of such desert dwellers dropped by eight percent over the past decade, the total area of food deserts had actually expanded, particularly in the eastern part of Baltimore City. Majority desert dwellers are African Americans who saw their share increased from 68.44% to 71.53% over the period, whereas non-Hispanic white population dropped from 28.53% to 22.21% during the same time span. To fill the gap and compensate the loss, more people from minority groups, particularly Latinos, have moved into the food deserts. Surprisingly, Latino desert dwellers have tripled in terms of both total number and percentage point over the period. These findings can be used to address current public health and social concerns surrounding food deserts. Maps generated also can be used to determine site locations for new grocers in the region.

Key Words: GIS, food desert, obesity, grocery store, poverty, Baltimore City

MAPPING THE NEW CORN BELT

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Abstract

The U.S. Department of Agriculture last delineated the regional boundary of the Corn Belt in 1950. Mixed farming practices found then have today transitioned to annually rotating corn and soybeans, which in turn has altered the geographic bounds of this region. Improved technology has allowed fewer farmers to farm more land. Marginal lands in the south have been taken out of production, irrigation now supports corn on the western plains, and new corn hybrids have been designed to allow for the short growing season along the region's northwestern fringe. To illustrate the changing geography of the Corn Belt over the past sixty years, ArcGIS geoprocessing and spatial analysis tools were used to map how the region's boundary has changed as myriad internal and external driving forces influence where farmers grow corn.

Key words: Corn Belt, regional geography, agriculture, land use change

MAPPING WATER RESOURCES IN THE PRAIRIE POTHOLE REGION

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Abstract

The Prairie Pothole Region (PPR) of the US and Canada is characterized by thousands of shallow water-filled depressions with sizes ranging from a fraction of a hectare to several square kilometers. Described as being one of the most important wetland regions in the world, the area is home to more than 50 percent of North American migratory waterfowl.

Detailed wetland mapping is prerequisite for wetland protection, development, planning, management, and restoration. Largely in response to the passage of the Emergency Wetlands Resources Act in 1986 and its amendments, the US Fish and Wildlife Service established the National Wetlands Inventory (NWI), the largest of the federal wetland mapping efforts. Mapping of the PPR water resources in the NWI was completed by late 1980s and the results converted into digital datasets by the early 1990s. It is unlikely that a regional survey of this detail and scale will be replicated in the near future.

Pothole wetlands in the PPR have changed a great deal since the 1980s, altering in size, shape, water regime, and vegetated stages. Scores of wetlands have disappeared in the intervening years. This project looks at rule-based, geospatial methodologies for producing detailed map datasets intended to update NWI. Since no one dataset can appropriately resolve water and wetlands at a detailed scale. This work uses airborne Interferometric Synthetic Aperture Radar (IFSAR) 2005 data products as core datasets: 5-meter Digital Terrain Models (DTMs) and 1.25 meter Orthorectified Radar Imagery (ORI) to extract wetland features.

Key words: wetland identification, radar imagery, rule-based geospatial methodologies

MEASURING PHYSICIAN ACCESSIBILITY IN OKLAHOMA CITY, OKLAHOMA

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Abstract

The purpose of this study is to identify areas within the Oklahoma City, Oklahoma Metropolitan Statistical Area (MSA) with limited access to physicians and determine if these residential areas of poor access correspond with disadvantaged socioeconomic groups. These “physician gaps” are identified by using a two-step floating catchment method in a geographic information system (GIS). An index of potential accessibility is developed and correlated with these physician gaps to concentrations of historically-disadvantaged groups. Bivariate correlation matrices are analyzed along with socioeconomic data from the Census Bureau.

For the Oklahoma City metropolitan area, physician gaps occur in the far southwest and eastern fringe of the MSA. Suburban locations tend to have less access than the central city due to the concentrated locations of healthcare facilities in Oklahoma City. These results reveal that inner-city residents have the best access to healthcare facilities across the MSA while rural residents have the worst access.

Keywords: Quantitative Methods, GIS, Health/Medical Geography

MEGAPOLITAN CORRIDORS AS NEW IMMIGRANT GATEWAYS: EMERGING ASIAN ETHNOSCAPES IN THE U.S. SOUTHERN PLAINS

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Abstract

Globalization has burgeoned cities into urban agglomerates enticing immigrants with economic prospects. With over fifty percent of the seven billion of its people living in cities, the world's urban geography is continuously transforming into international urban clusters. Within academia, there have been several attempts in defining these new urban regions. Terms such as “megaregions,” “megalopolis,” “metroplex,” among others, has attempted to characterize large American urban agglomerates. However, recent research led by Virginia Tech and Arizona State have envisioned the rise of new urban super clusters by incorporating their economic significance. These “megalopolitan” regions are new American corridors of growth, fueled by an influx of highly skilled immigrant workforce. This paper quantitatively analyzes one such megalopolitan corridor along U.S. Interstate 35 highway (I-35) connecting Oklahoma and Texas. Specifically, results reveal that highly skilled Asian immigrants are transforming the socio-economic and urban landscape of the I-35 megalopolitan corridor.

MIGRATION, LANDSCAPE, AND TRIGGERS IN COMMUNITY TENSIONS: PLANNING CLASHES IN BELLEROSE, QUEENS

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Abstract

Immigration and migration of Asian Indians have resulted in changing places in particular parts of the United States. One of the most significant increases in the Asian Indian population has occurred in New York City, especially in Queens. While Asian Indians have lived in places such as Jackson Heights, Queens, for decades, more recent settlements in eastern Queens have rapidly changed local landscapes in places of topophilia for long-term residents. Triggers of discontent and public expressions of frustration, mistrust and anger have occurred in conjunction with threats to existing landscapes in particular places. This paper examines some of those triggers and the resulting actions of the local, long-term populations of eastern Queens. Reactions have resulted in public protests, organized efforts for changes in planning regulations, and legal actions. Lessons learned in Queens may be applicable to other places that are experiencing similar changes in foreign-born populations with changing and visible landscapes.

MIGRATION, RESIDENTIAL SATISFACTION, AND THE DEVELOPMENT OF BUENOS AIRES' VILLAS MISERIAS

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Abstract

As in many large cities around the world, the marginalization of Buenos Aires' poorest residents has manifested itself spatially in the development of shantytowns, known locally as villas miserias. Theories of urban shantytown development focus in part on the origins of populations that move to these areas, and this paper tests these theories in the Buenos Aires context. Additionally, using behavioralist theories of migration as a framework, this article seeks to facilitate better understanding of migration motivations and residential satisfaction of shanty town dwellers. Using household surveys of two of Buenos Aires' most populous villas, this paper provides summary statistics on residents' birthplaces, finding that although many migrated to the villas from neighboring countries and other provinces in Argentina, substantial contingents engaged in both inter- and intra-urban migration. This paper further quantifies socio-economic variables that may affect residents' expressed desire to leave or stay in the villas.

Keywords: villas miserias, shantytown, Buenos Aires, urbanization, internal, transnational, migration

MODELING SUBALPINE AND UPPER MONTANE FOREST-CLIMATE INTERACTIONS IN COLORADO

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Abstract

The correlation of the distribution of five subalpine and upper mountain tree species with precipitation and temperature were modeled using GIS. The results were compared with data presented by Thompson *et al.* (2000). Distributions of subalpine fir (*Abies concolor*), Engelmann spruce (*Picea engelmannii*), lodgepole pine (*Pinus contorta*), limber pine (*Pinus flexilis*) and bristlecone pine (*Pinus aristata*) were compared to estimated precipitation and temperature fields that had been constructed from climate station and Snowpack Telemetry (SNOTEL) system data. The estimates from this study were different from those of Thompson *et al.* (2000). In many cases the range of the climatic parameter was smaller than those of Thompson *et al.* (2000). Suggestions are made to improve the predictive power of GIS analysis for mapping climate and plant variability.

Keywords: Southern Rocky Mountains, climate, Geographic Information System, subalpine forests, upper montane forests

NEW U.S. FRONTIER AND REMOTE (FAR) TAXONOMY

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Abstract

To assist in providing policy-relevant information about conditions in sparsely settled, remote areas of the U.S. to policy makers, researchers, and the general public, ERS and has developed a ZIP-code-level frontier and remote (FAR) taxonomy. The aim is not to provide a single definition but to meet the demand for a new delineation that is both geographically detailed and adjustable within reasonable ranges, in order to be usefully utilized in various research and policy contexts. The initial FAR trial version is based on rural-urban data from the 2000 decennial census for the lower 48 states but will be updated to the 2010 census for all 50 states with any adjustments that are prudent. This version has four separate FAR definition levels, ranging from one that is relatively inclusive (18 million FAR residents) to one that is more restrictive (4.8 million FAR residents). Users of the taxonomy would apply the FAR level that best coincides with their needs.

The FAR definition uses Census defined Urban Area categories of a range of populations in combination with car travel time categories to larger Urban Areas. The base data are 12 million one-kilometer squares that are then aggregated into geographic ZIP code areas for analysis. The ZIP areas are designated as “frontier and remote” based on a 50% population cut point (adjustable). Four levels are necessary because rural areas experience degrees of remoteness at higher or lower population levels that affect access to different types of goods and services. We are seeking advice about FAR before we perform the update.

Examples of the health care-related importance and uses of the FAR definition and the previously developed Rural-Urban Commuting Area (RUCA) taxonomy will be presented.

Key words: frontier, remote, definition, health care

NO LONGER THE RESIDUAL: CONSIDERATIONS IN THE DEVELOPMENT OF RURAL STATISTICAL AREAS

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Abstract

The Census Bureau and State Data Centers worked together on a three-year joint research project to develop geographic areas designed to facilitate tabulation and analysis of American Community Survey data for rural areas and populations. The Census Bureau used these “rural statistical areas” to create custom tabulations of 1-year ACS data for each of the project years. Unlike classifications in which “rural” is the residual after urban areas have been defined, the rural statistical area concept starts with the most rural areas of the nation and works up the rural-to-urban hierarchy to define areas that are most meaningful for rural analysis. The Census Bureau and State Data Centers are now moving to the next phase of this partnership—consideration of adoption of rural statistical areas as a geographic entity for use in standard Census Bureau data tabulations. In this presentation, I discuss the joint research project as well as questions and issues to be considered in the development of criteria for defining a nationwide set of geographic areas of 65,000 or more population.

ONE PLUS ONE DOES NOT EQUAL ONE: AN ECONOMIC DEVELOPMENT MODEL FOR THE WIND RIVER RESERVATION

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Abstract

Reservations have historically had high unemployment, start-bust businesses, and over-exploited resources by non-reservation entities. This project involves the development of an economic development plan for the Wind River Indian Reservation. The construct the foundation of the plan is a four phase process. The first phase is an identification of the overall economic goals for the Wind River Reservation. In the process of compiling the goals, a difference between the Eastern Shoshone and the Northern Arapaho tribes in their visions and direction for the reservation became evident. Differences between the two tribes manifested itself in their views of economic development, natural resource utilization, business development, employment opportunities, and investment. In the second phase, the spatial distribution of reservation resources are collected for both the natural and human-built environments on the reservation. Disparities in the distribution of resources makes it difficult to create a common vision and goals. By integrating the initial goals and the data-evidence, revised goals can be created, the third phase. In an effort to coalesce the vision for economic development, several broad based goals can be identified that will provide the needed planning direction. In the final phase, initial policies can be proposed and examined that will establish the future direction of the reservation. However, the policies have to correspond with the needs and wants of both tribal groups. The different phases of this project incorporated a range of both spatial and aspatial techniques. Group consensus building, citizen questionnaires and the utilization of GIS for spatial analysis are some of the basic techniques employed to construct the economic development model for the Wind River Indian Reservation.

Online Mapping for Fire Service First Responders

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Abstract

Professional firefighters for municipalities use vehicles equipped with mobile data terminals (MDT) in which they can access to the internet and often use Google Maps to locate fire hydrants in responding to fire emergencies. However, the locations of fire hydrants are not provided on the map. It is extremely beneficial to mark the hydrant locations on the Google Maps, and doing so would definitely save lives and property. The objective of this paper is to demonstrate a method that employs Google Maps JavaScript API V3 and other JavaScript libraries such as jQuery and XML for the development of an online mapping service application that focuses on not only the function to display the locations of fire hydrants and the information associated with them, but also the function to search fire hydrants close to the address of a 911 fire emergency call. A case study of an online mapping service to display and search over 450 locations of the hydrants in Wood River, Illinois is demonstrated.

Key words: Google Maps API, jQuery, XML, Online Map Service, Fire Emergency, First Responders

RACIAL AND ETHNIC ENCLAVES IN CALIFORNIA

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Abstract

A review of the racial (alone or in combination) and ethnic (Hispanic) makeup of the enclaves and exclaves created by incorporated place boundaries compared to the surrounding areas for California. Census designated place (CDP) creation in some states for the 2010 Census was targeted at creating place level census data for racial or ethnic communities that had not been annexed by adjacent incorporated places. This presentation is to provide the results of a systematic review of areas adjacent to incorporated places in California to identify any potential geographic patterns based on race or ethnicity to the annexation patterns of incorporated places.

RANGE OF VARIABILITY IN THE LIFE CYCLE OF BEAVER PONDS IN GLACIER NATIONAL PARK, MONTANA AS A CONTEXT FOR RESTORATION

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Abstract

A knowledge of baseline conditions and range of variability is essential for providing the context necessary for land managers who seek to enhance ecological function and engage in restoration necessitated by human disturbances. We investigated variability in number and areal extent of beaver ponds in two valleys in Glacier National Park, Montana, one in pristine condition and one disrupted by a century-old reservoir. Potential sites were identified on Google Earth, and U.S.G.S. 1:24,000-scale Digital Orthophoto Quarter Quads from 1991, 1995, and 2003 downloaded. Polygon shape files of beaver ponds were created, and area of individual ponds and total pond area at each site were calculated for each year. The reservoir site had more ponds in each year, as well as a more steady growth rate than the pristine site which also had a higher occurrence of ponds infilling.

REAL ESTATE STRATEGIES FOR NATURAL RESOURCE PRESERVATION

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Abstract

Natural resources in the United States, consisting of prime agricultural land and forests, are regularly lost due to permanent conversion resulting from real estate development associated with suburban sprawl. Extraction of forest and mineral resources is also a significant cause of these losses. Additionally, the conversion of agricultural land and forests in this manner has negative implications for fresh water resources, including groundwater, rivers, and streams.

The forces driving these losses are economic in nature. Consequently, it is argued in this session that the most effective strategies to prevent or minimize the loss of these important resources are those that focus on creating financial offsets to the economic forces driving development and extraction. These strategies include charitable gifts of remainder property interests, conservation easements, special financing, land owner-farmer agreements, right-to-farm laws, and real estate tax incentives, including tax reductions for agricultural land use or participation in forestry management programs.

A variety of real-life examples of these strategies from New York State's Hudson Valley region will be presented. This will provide several potential model strategies that can be implemented in other jurisdictions, and will include details of the circumstances and characteristics that made those strategies successful.

Key words: agricultural land, forest, conservation easement, real estate, right-to-farm, suburban sprawl, development, fresh water resources

REASSESSING A FOOD DESERT: PROGRESS IN MIDTOWN, ST. PETERSBURG

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Abstract

In this paper, we re-evaluate the status of the Midtown neighborhood of St. Petersburg, Florida to determine if efforts to increase access to services in this economically distressed community over the last 12 years have been successful. Spatial analysis of income and ethnicity data reveals clear patterns of at least three vulnerable and isolated communities within the municipal boundaries of St. Petersburg. Of these, Midtown has received significant public attention following the shooting death of teenager TyRon Lewis by police in 1996, and the subsequent riots that ensued in the Midtown area. The city responded by creating a development plan for the neighborhood that included movement of essential services such as grocery stores and a post office into the area. Using geographic information systems, we map the locations of major supermarkets, small grocery stores and ethnic markets to reassess the status of Midtown as an urban “food desert.” We deepen this analysis by adding in several other variables, including comparison of prices using “food baskets,” location of bike racks at food stores; bus routes; car ownership patterns, spatial concentrations of crime, and walking routes to food stores. We are then able to assess the progress that has been made in increasing access to high quality, reasonably priced food in Midtown. This paper is part of a larger project comparing three neighborhoods in St. Petersburg based on quality of life indicators and access to essential services, including health care facilities.

Key words: food desert, access, health, GIS.

REFINING THE SPATIAL PREDICTION OF EXPECTED PROBABILITY OF HURRICANE LANDFALLS IN SOUTH CAROLINA

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Abstract

Prediction of the probability of hurricane strikes is essential to risk assessment. Conventionally, expected probability is calculated based on the cumulative frequency of paths of historical hurricanes that made landfalls within a specific coastal region or geographic area. Each hurricane path here is not treated as a swath or an area. The method therefore does not result in information that differentiates intra-area variation in possible hurricane strikes. It also tends to underestimate the potential threatened areas due to the exclusion of hurricanes that might have impact but made landfalls just beyond the boundary of study area. This study proposes an alternative approach to overcoming these shortcomings. By applying a function that depicting wind intensity decay with distance away from the hurricane center, we calculated for each location the cumulative frequency of wind gusts of historical hurricanes that exceed the wind speed threshold set for each specific category. Then we estimated the expected probability for each category with improved spatial approximation from zero-dimension (point data) or one-dimension (linear track) to two-dimensions (strike area or wind field). As applied in South Carolina, the methods lead to maps of cumulative frequency and expected probability that can be used to identify the spatial extents but also frequently stroked areas of different categories of hurricanes. The information can be used for making spatially differentiated decisions in coastal management, disaster mitigation and insurance rate determination.

Key Words

Hurricane landfall, tropical cyclone, cumulative frequency, expected probability, natural hazard, South Carolina

RELATIVE SOCIAL DISTANCE: AN ANALYSIS OF THE RESIDENTIAL SEGREGATION BETWEEN AFRICAN AMERICAN AND WEST INDIAN BLACKS

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Abstract

Identity presents a major problem for West Indian's – because of their color, their identity is automatically linked to the African American identity, which had been and continues to be elevated to public consciousness in the form of negative stereotypes. Many West Indians believe the assigning of an African American identity to them equates to downward mobility; to avoid this, some devise defense mechanisms to socially distance themselves from African Americans and the African American identity as posited by social identity theory. Some West Indians – in hopes to establish their identity during this distancing process – seek to perpetuate the stereotypes of African Americans with the overall goal of highlighting how *they* (West Indians) are different. The manner in which the West Indians create their own American identity culminates into social friction between these two groups. According to ecological theory, because there is documented evidence of this friction, there should be some physical evidence of it between the two groups in the form of spatial distance – the ultimate outcome in social identity formation from a perceived negative influence. The objective of this study is to analyze the spatial segregation between African Americans, West Indians, and the majority white group in New York using indices of dissimilarity, interaction, and isolation. In addition, a principle components regression is performed on several social, economic, and housing variables at the census tract level to elucidate the importance these variables may have in influencing the spatial distribution of African Americans and West Indians.

The dominant society has labeled West Indians a “model minority” which carries assumptions of a preference which has never been given to African Americans. This label effectively says that mainstream America prefers West Indian blacks to African Americans thus creating categories of good and bad within the black population. This preference should be evident in a spatial context – i.e. the degree of segregation between West Indians and Whites should be less than that seen between African Americans and Whites. The results, however, revealed that in 2000, the West Indians were more segregated from the white group than the African Americans were. In addition, results for 2010 revealed that the segregation between West Indians and the white group increased while the segregation between African Americans and the white group decreased. The results from the analysis of segregation are supported by the analysis of interaction. African Americans had more interaction with the white group than the West Indians had, and that level of interaction between African Americans and the white group increased between 2000 and 2010. West Indians on the other hand, who had a lower level of interaction with the white group in 2000, had an even lower level of interaction with both Whites and African Americans by 2010. The results of both of these analyses are supported by the examination of isolation indices – both African American and Whites displayed decreasing isolation while the West Indian group experienced increasing isolation between 2000 and 2010. All of these results – in combination with the results of the PCR – suggest that the West Indians are just as spatially confined as the African Americans despite the “model minority” billing. In addition, this spatial confinement is to the same relative locations as

the African Americans. The increasing isolation of the West Indians, however, indicates that they are becoming more spatially clustered within the confines of African American “space” occupying areas of greater affluence.

RETHINKING CLASSROOM SPACE: STUDENT HABITS, PREFERENCES AND PERFORMANCE

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Abstract

What role does seat location play in student engagement and learning? While it might be assumed that students who sit at the front do better, previous research has been inconclusive. The purpose of this study is to investigate the micro-scale environment of the classroom in terms of student habits, engagement and performance.

This paper reports results from a pilot study conducted in an introductory geography class at a regional public university located in the Midwest. Fifty students completed a pilot survey on seat preference, engagement, and learning in spring 2012. Preliminary results suggest that seat preference is affected by gender and it is perceived to affect learning. Understanding how students choose their seat may allow educators to optimize classroom layout in order to enhance student engagement and performance.

SELF-EFFICACY AND PERFORMANCE OF HIGH SCHOOL STUDENTS ON A MAP SKILLS SURVEY

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Abstract

This paper presents results from a study about high school students' understanding of maps, their ability to use them, and their confidence in performing such tasks. The map skills survey, developed by this researcher, was aligned with map skills in the national Geography standards, Geography for Life. The survey was administered to 227 high school students in 3 states, Illinois, Pennsylvania, and Texas. A subset of survey respondents were also interviewed. Overall, student performance on the survey was limited; performance was correlated with 3 variables: gender, grade level, and self-efficacy. This paper reports results specifically from the survey with a particular focus on the relationship between self-efficacy and performance.

Key words: Mapping; geography education

SITE, SITUATION, AND PROPERTY OWNER DECISION-MAKING AFTER THE 2002 GUADALUPE RIVER FLOOD.

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Abstract

On July 2002, the Guadalupe River, in Comal County, Texas, crested 25 feet above flood stage at Canyon Lake Dam and pushed south inundating hundreds of structures along 25 miles of the Guadalupe River Valley (GRV). The GRV has experienced persistent residential and commercial development over recent decades. The aesthesis of this segment of the GRV, its potential for tourism, and its proximity to IH35 has supported high property values despite a history of damaging floods. This study assesses the relationship between *site characteristics* (land parcel/improvements), *location* (relative to river valley features), and property owners' *post-disaster decision-making* in this dynamic floodplain. Owners made four types of decisions following the flood: (1) participated in buyout program; (2) repaired flood damages and maintained ownership; (3) did not repair flood damages and maintained ownership; or (4) did not maintain ownership between 4 July 2002 and 4 July 2004. A geographic information system (GIS) was used to analyze cadastral data, flood data, and floodplain characteristics. Descriptive statistics revealed that many owners improved their damaged properties, but not all owners retained ownership after this initial improvement phase of reconstruction. Multinomial logistic regression identified that *land value prior to the flood* and *parcel distance* to the Guadalupe River were statistically significant predictors of property owner decision-making. This result further illustrates the dominance of a *river-as-amenity* approach to land management following the disaster and paints a picture of a dynamic real estate market in the wake of the flood disaster.

Key words: disaster, floodplain, development, decision-making, multinomial logistic regression

SOCIAL AND SPATIAL SEGREGATION – AN EMPIRICAL STUDY OF MIGRANT POPULATION IN BEIJING, CHINA

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Abstract

China's fundamental urban transformation has been accompanied most notably by a massive exodus: movement of millions of peasants to the cities, going together with a shift of their work activities to manufacturing and various services; and the changing nature of their lifestyles in cities and towns. However, migrants in the cities are barred from becoming full citizens by the so-called "institutionalized discrimination" through the "hukou" (household registration) system. Migrants face considerable hardship in Chinese cities as they are denied access to good jobs and to the aforementioned urban entitlements.

This study examines the pattern of new urban segregation in Beijing from both nonspatial and spatial perspectives. Specifically, three major issues will be addressed in the paper: (1) social segregation as measured by some common characteristics of migrants in Beijing; (2) spatial patterns in the distribution of migrants in Beijing; and (3) degrees of residential segregation in Beijing between migrants and permanent local *hukou* residents.

The research findings will reveal how rural migrants, as a social group, are socially and spatially marginalized from the mainstream urban society, and help understand the new dynamics in the Chinese city involving conflicts and continuous struggles over the built environment, residence, and public space and services by different social groups.

Key words: social and spatial segregation, rural migrants, Beijing, China

SOIL LEADCONTAMINATION, INCOME LEVEL, AND RACE AT CHILD DAY CARE CENTERS IN GREATER CINCINNATI

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Abstract

Children who reside within urban settings are at risk of high lead level exposures, which cause serious impairments to their brains or fatal loss of life. These silent and deadly exposures can be found in such places throughout the environment. Spaces and places that are frequently occupied by children under the age of six years old are of highest concern. This research examined soil lead contamination at child day care centers located in the greater Cincinnati area. It was found that the child day care centers that had the highest concentrations of soil lead were also the child day care centers that had predominately non-white students, low medium household incomes, and the lowest tuition rates. This indicates that children of marginalized race and class are more likely to be exposed to high concentrations of soil lead contamination at the child day care centers they frequent on a daily basis. Furthermore, this trend continued to be significantly prevalent for non-whites and poorer populations at the child day center scale, and three scales of census area (i.e. census block, census block group, and census tract).

Key words: income, class, soil contamination, lead exposure, race.

SPATIAL ANALYSIS OF VECTOR-BORNE WEST NILE VIRUS POSITIVE SITES IN FAIRFAX COUNTY, VA FOR EMERGENCY PLANNING

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Abstract

With the alarming global spread of vector-borne diseases, there is a need for the development of emergency planning systems to readily notify the public in high transmission risk areas. Using West Nile virus (WNV) in Fairfax County, VA as an example, this paper offers a viable and affordable solution regarding a surveillance technique that can identify WNV while utilizing Geographic Information Systems (GIS), spatial statistics, and remote sensing. Using local field surveillance mosquito data, Census population data, and environmental data such as water features, spatial statistics revealed that clustering patterns were prevalent in the study area. As a result, a strong correlation for WNV-positive mosquitoes exists when factoring for specific water features such as storm drains in conjunction with WNV-positive ground testing. Since technology has now progressed to the point of affordability for most local jurisdictions, this paper shows that a local low cost surveillance model can be achieved by employing proper data acquisition, ground testing, scientific methods, and GIS software.

SPATIAL COMPETITION BY US RETAILERS

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Abstract

The retail sector is vital to the US economy. It accounts for millions of jobs and trillions of dollars in sales. As the retail landscape is continually changing, this moving target needs to be better understood. One method is to analyze the retailers within the sector along the lines of how their stores are arranged in space. Taking this a step further, this study examines how different types of competitors arrange themselves in markets, notably along the lines of strategies of concentration or dispersal. This includes discount department stores, such as Target and Walmart, as well as category killers such as PetSmart and Petco. Spatial competition is evaluated at the metropolitan level in five US markets using descriptive statistics and the Cross-K function. This paper advances the knowledge of which competing retail chains attract, repulse, or are indifferent to each other in space.

STUDY ON THE MORPHODYNAMIC CHANGES OF YAKHAR GLACIER USING REMOTE SENSING AND GIS TECHNOLOGIES

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Abstract

Being in a semi-arid region and on the top of Damavand volcano, Yakhar glacier is an exceptional natural phenomenon with a height of 5500 meters above mean sea level. This research aimed to study morphodynamic changes of Yakhar glacier using remotely sensed data and GIS technologies. The main hypothesis here is that this glacier is an active glacier and has undertaken a number of changes during recent years. To prove this hypothesis, Landsat TM, ETM+ and IRS data were first corrected for geometric and radiometric errors and registered on each other using a first order polynomial transformation model. Based on ground truth survey and image processing techniques such as band ratio and ISODATA clustering algorithm, glacier boundary was extracted from satellite images. With the use of a combination of different processes including band subtraction, PCA and fuzzy logic Morphodynamic changes were studied. RGB band composites of TM and ETM+ were used to study the hydrothermal areas in the glacier. Lineaments also extracted from Landsat TM and ETM+ band 7 to verify any changes in this area. The results of this research show that the area of Yakhar glacier is reduced by 0.2 km². Decline of glacier recharge and the heat of smoke emerging from Damavand volcano are observed to be the main causes of this reduction.

Key words: morphodynamic changes, remote sensing, fuzzy logic, Yakhar glacier.

SUBSTANCE VERSUS STYLE: WHAT IS THE ROLE OF NEW URBAN DEVELOPMENT IN THE RESTRUCTURING OF METROPOLITAN RETAIL?

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Abstract

New Urbanism has become increasingly popular as planners, policy makers and developers attempt to combat the issues associated with urban sprawl. New Urban developments mix residential, retail, and other workplace land uses into the same complex, with the goal of decreasing automobile use, increasing diversity, and building community. There is surprisingly little discussion of the role that retail activity plays fulfilling the goals of New Urbanism. This paper explores the composition of retail activity in New Urban developments in Dallas-Fort Worth in comparison with several shopping center types identified by the International Council of Shopping Centers to determine where New Urban developments fit in the hierarchy of retail clusters. The automobile-dependent nature of these developments as regional attractions, and the dominance of high-end boutiques and national clothing chains suggest that New Urban developments may represent a repackaging of other forms of shopping center, and do not drive fundamental retail restructuring.

Key words: New Urban development, shopping malls, big box activity, retail, Dallas-Fort Worth

SURVEY ANALYSIS OF SUSTAINABLE WATER RESOURCE PLANNING IN THE HEADWATERS OF SOUTHERN APPALACHIA

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Abstract

Communities in western North Carolina are located at the headwaters of several major river basins where little attention has been paid to water resource planning. However, the area has experienced water shortages and increased development driven by second homes and tourism in recent years. Eighty-five planners, utility personnel, managers, and elected officials were surveyed in a ten county region to assess how communities are addressing water resource planning. The survey examined how data and policies are used in water allocation and management decision making. Analysis indicates perception rather than scientific studies on water resources most inform many water management decisions. While almost half of respondents have seen a decrease in their water supply in the past ten years, efforts have focused on increasing supply rather than decreasing demand through conservation efforts. This analysis is integrated with water use and growth forecast data to better inform regional water resource planning.

Keywords: sustainability, water resources, planning, surveys, water policy, demand forecasting, decision-making.

SUSTAINABLE COMMUNITY DEVELOPMENT IN THE GREATER YELLOWSTONE ECOSYSTEM: A CASE STUDY OF JACKSON, WYOMING

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Abstract

To facilitate community objectives toward sustaining the natural environment, while simultaneously sustaining economic activity, it is imperative that the perceptions and experiences of local communities be documented, as well as the ways in which perceptions are prioritized and acted upon. This is particularly true where the natural environment is important to the lifestyles and economy of the community and region. Earlier studies reported on apparent priorities of two communities in the Greater Yellowstone Ecosystem (GYE), West Yellowstone and Red Lodge, Montana. The objective of this study was to determine how a third amenity-driven GYE community, with contrasting socio-economic conditions, Jackson, Wyoming, perceives sustainable community development and natural resource management. A content analysis of newspaper articles published between 2000 and 2010 was undertaken to meet study objectives. Findings suggest that perceptions and priorities differ between Jackson and other GYE communities. It is suggested that these variations are based on differing socio-economic conditions, proximity to Yellowstone National Park, and dependence on tourism-based industries.

Keywords: Sustainability, Greater Yellowstone Ecosystem, Community Development, Natural Resource Management, Jackson, Wyoming

SUSTAINABLE DEVELOPMENT OF GROUNDWATER RESOURCES IN THE ENVIRONS OF MADHURAWADA DOME, VISAKHAPATNAM DISTRICT, INDIA- A GEOSPATIAL TECHNOLOGY APPROACH

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Abstract

The study area, centered around the Madhurawada structural dome, lies in Visakhapatnam District of Andhra Pradesh State on the east coast of India. Covering 192 km², the area consists of two non-perennial drainage basins of the Peddagedda River and Maddigedda rivulet. The average annual rainfall of the area ranges from 1000 to 1200 mm. There are about 50 surface water bodies of which eight are perennial. The population of the area in 2010 is estimated at 61 000. In this study, topographic maps, satellite images and geologic maps of the study area have been used to generate thematic maps of drainage, geomorphology, lineaments and land use/land cover. Cultivation is the major land use in the upper and lower reaches of the Peddagedda River whereas urban build-up occupies the watershed of Maddigedda rivulet. Twenty four dug wells monitored during pre- and post-monsoon periods in 2010 revealed the area configuration of the water table. Analyses of these data in the ArcGIS 9.2 environment helped to delineate zones with groundwater potential in the study area. Following the guidelines of Groundwater Estimation Committee-1997 - studied available groundwater resources, current discharge and future requirements for the year 2025. The study area has been divided into run-off zones (about 57 km²) and recharge zones (about 135 km²) corresponding to hills and plains, respectively. The study area has total groundwater resources of Cultivation is the major land use in the upper and lower reaches of the Peddagedda River whereas urban build-up occupies the watershed of Maddigedda rivulet. 197475.4 h.m. The groundwater requirement in 2025 is estimated at around 1.621 h.m/day. Even though the area has surplus groundwater resources, the resource should be managed on a sustainable manner to meet the future demand.

TARGETING VS. CONNECTING IN BIOTECHNOLOGY

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Abstract

Many states and regions are chasing biotechnology in pursuit of economic development. North Carolina is one such state. While the state's Research Triangle is well-known for biotechnology, few are aware of an emerging biotechnology presence in the Charlotte, North Carolina region. This paper summarizes the size, scope, and performance of biotechnology in the 16-county region surrounding Charlotte. After providing a working definition of biotechnology and describing biotech activity in the Charlotte region, this paper: 1) outlines procedures for targeting biotechnology firms for industrial recruitment; 2) identifies underutilized local industry sectors within the biotech supply chain that could strengthen local biotech firms and enhance economic development potential; and 3) advocates connecting emerging biotech activity to existing firms in the region over industrial recruitment, *per se*. The procedures and findings are summarized using a subsector of biotechnology, Medical Devices and Equipment, as an example.

Key Words: biotechnology, industry targeting, import substitution, Charlotte, North Carolina

TEXAS' WORLD REGIONAL GEOGRAPHY END OF COURSE EXAM: A PRELIMINARY ASSESSMENT

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Abstract

Since 1993, Texas schools have had an accountability system based on standardized tests. In 2012, the number of tests high school students have to pass in order to graduate increased from four to twelve. The new tests take the form of end-of-course exams, and are part of the new State of Texas Assessments of Academic Readiness. One of the new end-of-course (EOC) exams assesses student achievement in World Regional Geography. This paper provides an overview of how the World Regional Geography EOC exam has been implemented. In addition, this paper utilizes ArcGIS to conduct a spatial analysis of the first set of statewide results (released 8 June 2012) at the school district scale. Finally, this paper provides a detailed case study of results for all high schools in the Houston Independent School District (HISD) – the largest in the Texas with more than 200,00 students.

Key words: geography education, world regional geography, assessment

THE FOREIGN-BORN BLACK IMMIGRANTS IN FRANKLIN COUNTY AND COLUMBUS, OHIO. 1990 - 2012: SETTLEMENTS PATTERNS AND SOCIOECONOMIC STATUS.

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Abstract

Immigration research has demonstrated recent immigrant settlements that reflect human and social capital leading to diverse assimilation paths. In addition, many recent immigrants are choosing non-traditional points of entry in the country and, in many instances, the numbers are enough to earn these entry point new gateway status for certain specific ethnic immigrants. Columbus, Ohio has become a choice destination for recent sub-Saharan Africans especially, West Africans entering the country under the Diversity Lottery visa and family reunification. Augmenting these numbers are black immigrant transplants from most New York City seeking more economically attractive alternative destination. Over the last two decades this medium size SMA has undergone a notable black population diversification. This study focuses on West Africans, especially the Ghanaians foreign-born in Columbus over the last three decades. This study also explores the settlement and socio-economic changes of black ethnic foreign-borns for the past two decades, 1990 to 2010, in Columbus. A spatial analysis of the settlement patterns and the associated variables of socio-economic status are performed. This study uses PUMS data for 1990, 2000 and 2010 to examine the rise of ethnic African immigrants in Columbus and Franklin County, Ohio. The expected outcomes will show a bifurcated foreign-born black ethnic community with settlement patterns reflecting corresponding socio-economic

THE GEOGRAPHY OF MARKET CONCENTRATION IN THE U.S. AIRLINE INDUSTRY

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Abstract

The post-deregulation period in the U.S. airline industry has been tumultuous. Many long-standing carriers have disappeared through bankruptcies and mergers, a multitude of ‘startup’ carriers has come and gone, and many small regional carriers have moved into code-share partnerships with the larger carriers to expand the latter’s profitability and network coverage. One of the promises of deregulation from its proponents in the 1970s was increased competition that would lead to a reduction in fares for consumers. The nature of the airline industry, however, is argued by many to be oligopolistic with a few carriers supplying most of the service, and the decades since deregulation have shown a tendency for carriers to grow in size through direct expansion or consolidation in order to cover as much of the U.S. commercial airport system as possible to remain competitive with the other significant players in the industry. The trend for further consolidation has continued in recent years with the merger of Delta and Northwest, the merger of United and Continental and the merger of Southwest and Air Tran. Recent financial troubles at American Airlines and slippage in market share by both American Airlines and USAirways has raised speculation of a potential merger of the two carriers, and in fact, this merger is being pursued aggressively by the upper management of USAirways.

When large companies propose mergers or takeovers, the U.S. Department of Justice and the Federal Trade Commission investigate the proposal to check for major changes in market power that are likely to occur from the merger. The common measure used in such an analysis is the Herfindahl index, which measures the competitive concentration of an industry overall. This paper will explore the current level of market concentration in the airline industry as a result of the recently approved mergers as well as calculate the impact that a proposed American Airlines and USAirways merger would have on the industry. In addition to the traditional use of the index to examine market share concentration for the industry overall, we will also use the index to look at market concentration on 6200 city pair routings to look for regional or geographic problems in market concentration that currently exist in the industry and new problems that may occur from the proposed merger.

Key words: airline mergers, market concentration, Herfindahl Index

THE QUALITY OF CONTINUOUS SURFACES DERIVED FROM POINT SAMPLED DATA AND CARTOGRAPHIC GENERALIZATION

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Abstract

Spatial data are frequently collected as discrete point entities with attribute values and geographic coordinates. For the purpose of studying spatial patterns of natural or socio-economic phenomena and causes of spatial distribution, continuous surfaces must be obtained from these point data sets. Numerous interpolation methods were developed to transform point information into continuous surfaces. However, none of the interpolation methods is perfect, therefore comparative studies must be developed to evaluate and model errors, their magnitude and probability of occurrence. The purpose of this project is to compare performance of inverse distance weighting method (IDW) to more sophisticated interpolation methods, kriging and cokriging. The magnitude of errors is evaluated and compared to the quality and visual characteristics of cartographical output. The paper discusses also the “trade-off” value between visual appearance and precision of mapping phenomena.

Key words: Point sampled data, interpolation, errors, inverse distance weighting, kriging and cokriging.

THE UNFORGETTABLE SUMMER OF 2011: HEAT AND DROUGHT IN THE SOUTHERN PLAINS

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Abstract

This paper explains why the summer of 2011 will be remembered as one of the very hottest and driest on record. By some measures it was the hottest on record. In the Dallas area, it broke the record for total number of days with temperatures above 100° F. but not the record for number of consecutive days with temperatures above 100° F. Virtually no rain fell for over two months. The causes of such a heat wave and accompanying drought were similar to the extreme summer of 1980. During both events, the atmospheric circulation over the central and southern plains was dominated by a large, strong anticyclone that was locked in place for the entire summer. This blocking high pressure cell cut off any possibility of precipitation, and the subsiding air pushed temperatures above 100° F nearly every day.

THE WEB AND GLOBAL CITIZENSHIP: AN ONLINE VIRTUAL EXCHANGE

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Abstract

Expanding our students' "global perspective" continues to be a core emphasis in undergraduate education and geography in particular. Goals for this approach include preparing our students for globalized markets, addressing sustainability issues, and enhancing democracy globally. Given the growing cost of study abroad programs, educators are increasingly turning to the web to provide global experiences for our students. Many of these attempts, however, require significant time and resource commitments which present impediments to broader-scale adoption. We outline an exercise utilizing easily available web conferencing tools for a two- or three-week exercise requiring minimal costs and instructor time commitment. As such, we believe our model is more likely to be replicated across the curriculum and have broader impact on enhancing students' global perspective. Additionally, our student-led approach created a novel learning experience revealing which aspects of a global perspective our students were interested in.

Key words: global perspectives, virtual exchange, teaching, student-led exercise

THE WILDFIRE HAZARD IN BERNALILLO COUNTY, NEW MEXICO, USA

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Abstract

Every year in the United States, wildfires damage communities, destroy the homes and belongings of individuals, and take lives. Within hours, a wildfire can marginalize a community and many of its residents. In 2011, there were 73,484 wildfires in the United States, which burned over 3.5 million hectares. The damage/costs in the states of Arizona, New Mexico, and Texas alone was over 1 billion US dollars. A single wildfire, the Bastrop Fire in central Texas, killed five people and destroyed over 1,600 homes, which in some cases represented all of the residents' assets. Hundreds of communities that are vulnerable to wildfires have been identified in the western United States. This paper focuses on the wildfire hazard in Bernalillo County, New Mexico, USA, which includes the city of Albuquerque. Bernalillo County is vulnerable to wildfires that originate in the bosque, which are protected groves of trees along the Rio Grande, and in the area east of the Sandia Mountains, which forms the eastern boundary of the city of Albuquerque. The paper will analyze the wildfire mitigation measures enacted by Bernalillo County and the city of Albuquerque, the characteristics of the vulnerable population, and measures that vulnerable households have taken to protect their residences.

Key Words: Wildfire, Hazard, New Mexico, Vulnerability, Mitigation

THREE-DIMENSIONAL BUILDING MODELING USING STRUCTURE FROM MOTION: IMPROVING MODEL RESULTS WITH TELESCOPIC POLE AERIAL PHOTOGRAPHY

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Abstract

The creation of georeferenced, three-dimensional (3D) models is a highly effective method in visualizing buildings, archeological sites, and many other types of on-ground features/structures. Such recreations are useful in a number of geographic applications like city/urban planning, photogrammetry, cartography, archeological and historical preservation, as well as topographic modeling. Structure from Motion (SfM) provides a means to create such models at the low-cost of a single digital camera (as opposed to the high-cost of a terrestrial or airborne lidar scanner). SfM works by automatically matching thousands of conjugate image points in many images of the same scene, accurately preserving in great detail the geometric properties of the structure.

This study explores the use of the SfM method in the reconstruction of a historic building façade in San Antonio, Texas: Mission Espada. In addition to photographs taken on-the-ground, this paper employs a low-cost telescopic pole providing low-altitude oblique aerial photography to improve the overall quality of the resulting 3D model. Two separate models in two formats (point cloud and mesh) are created and qualitatively compared using (1) only on-ground photographs and (2) both on-ground and low-altitude photographs. The telescopic aerial photographs are shown to improve model results by increasing the number of perspectives (angles) of the target structure. Increased perspectives result in a denser point cloud and a fuller, more life-like mesh representing the façade structure. In addition, high angle photographs are shown to aid in georeferencing the created model because of improved capture of ground control points. Other uses for such low-altitude oblique aerial photography are also discussed.

Keywords: 3D urban modeling, structure from motion, visualization, Lidar, remote sensing, GIS

THREE-DIMENSIONAL MODELING OF LEAD CONTAMINATION IN AN URBAN WETLAND

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Abstract

Between 1930 and 1963, the La Crosse Gun Club discharged large quantities of lead (Pb) shot into an urban marsh in the heart of La Crosse, Wisconsin. Determining the spatial distribution and potential danger of this legacy contamination is important for protecting both wildlife and the surrounding community that interact with this marsh daily. To quantify the Pb concentration spatially throughout the shot fallout zone, we collected 30 sediment cores (divided into 2 cm sample increments) and 450 surficial (0-5 cm) sediment samples. All samples were dried and ground to <2 mm prior to X-Ray Fluorescence (XRF) analysis at the University of Wisconsin-La Crosse. A representative population of 70 samples was tested by an independent lab via inductively coupled plasma to calibrate and verify our XRF data. Sample results were then interpolated to create a three-dimensional model of Pb concentration across the study area. Over 3.9 hectares surpassed the Environmental Protection Agency's hazard standard of >400 ppm, with a maximum value of 31,100 ppm occurring within the expected shot fallout zone. Depth to maximum Pb concentration varies throughout the study area due to spatially variable sedimentation rates and bioturbation. These findings have guided surface water and biological sampling as we investigate the toxicological effect of this Pb contamination. Our research methodology and findings will also benefit other environmental contamination studies and remediation efforts that continue at active and abandoned shooting ranges worldwide.

Key words: heavy metals, XRF, X-ray Fluorescence, spatial modeling, soil contamination

TRACKING URBAN SPRAWL: EXAMINING CHANGING LAND USE COVER

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Abstract

Efforts to identify sprawl by planners and urban scholars have been ongoing for some time. Studies in the 1970s and 1980s often identified patterns on the landscape and proposed related socio-political consequences. More recent efforts have also focused on identifying causal variables and their combinations through a variety of statistical analyses. These findings have been extended to resultant ecological patterns similar to those identified previously. In most cases, large metropolitan areas have been the foci of study and census data has dictated the time frame. The purpose of our research is to present an application that is both accessible and usable by those in planning fields to identify patterns of sprawl in a timely manner and at a geographic scale that can also serve smaller urban areas. We propose a method to examine changes in land use cover and land use change to help monitor growth that uses free data available annually at a scale that is appropriate for the geographic extent of the planners' realm of responsibility. This application assists in the recognition of patterns of sprawl and its changing form.

Key words: sprawl, land use cover, land use change

TREE CANOPY FOLIAR VOLUME FROM TERRESTRIAL LIDAR SCANNER DATA

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Abstract

Biogenic volatile organic compounds (BVOC) released from trees react with NO_x from combustion to produce ground-level ozone (Owen, et al). Because trees contribute to the formation of ozone in U.S. regions and cities, they are of great interest to air quality researchers. BVOC emission rates can be estimated for an entire tree canopy if the tree's leaf mass density is known. Many methods are employed to assess leaf mass and total canopy volume, but most are destructive methods. The purpose of this project is to perform novel, non-destructive measurements of leaf mass volume using a terrestrial lidar scanner (TLS).

TLS is well-suited to create a three-dimensional point cloud of a tree canopy, because the lidar sensor can be positioned relatively close to the tree and is capable of the fine resolution required to detect small features of the canopy, such as leaves and twigs. This paper describes the development of a methodology to accurately measure total canopy leaf volume by comparing lidar data from a single Laurel Oak (*quercus laurifolia*) tree in its leaf-on and leaf-off phases. We test various voxel (3D pixel) sizes to determine the most appropriate resolution for modeling Laurel Oak leaves. Then, the volume of the leaf-off voxels are subtracted from the volume of the leaf-on voxels. The result is a measure of the total leaf volume. Our findings indicate that obtaining an accurate volume for canopy components will give researchers an improved means by which they can extrapolate selectively sampled leaf mass measurements of individual tree species to the entire forest canopy, and in turn can be used to facilitate ozone production estimates.

Key words: terrestrial lidar, tree foliar volume, biogenic volatile organic compounds

“TRUE GEOGRAPHERS:” ETHNOGRAPHIES OF TEACHING AND LEARNING IN THE FIELD

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Abstract

Being in the field –that is the love of traveling, exploring new places and landscapes, and learning new ideas outside the traditional setting of the classroom – is what compelled many of us to become geographers. *Teaching* in the field can also be an exciting and overwhelming process. No amount of preparation can prepare the instructor for what may happen in the field, including the reaction of students to field-based learning. Anecdotal evidence suggests that this field-based experience is a powerful learning activity and continues to evolve into a richer, more meaningful pedagogical experience for both students and instructors. However, this evolution is driven by constant critical reflection and restructuring of field instruction, not because of content problems but rather because of students’ reactions to learning in a non-traditional, “out of the classroom” environment. This paper explores qualitative data collected over a decade of field instruction, and offers suggestions for innovative teaching and research in geography field-based education.

UNDERSTANDING FOOD AVAILABILITY IN LARGE METROPOLITAN CENTERS AND THE POSITIONING OF INDEPENDENT AND LARGE CHAIN GROCERS FROM A GEOGRAPHIC PERSPECTIVE

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Abstract

The notion of food deserts has received much notoriety in publication and press. An often overlooked aspect of food desert research is the inclusion of small independent grocers, particularly in large cities where they can number in the hundreds. Capturing the spatial extent of independent grocers typically involves surveying all streets and identifying their presence. Clearly, this can be a tedious, but essential task to understanding any city's food desert situation. It can be suggested that the incidence of independent grocers is more likely to occur in larger than smaller-sized North American cities. As such, this study focuses on the City of Toronto with a greater metro population of 6 million and its niche grocers. Due to a decline in small, independent grocers over the past several decades in favor of large, mixed grocer operations the availability of healthy food within cities is being questioned. Small and medium-sized cities seem particularly susceptible since the independent grocer has been "squeezed-out" in favor of larger food stores that typically operate of notable distance to one another. In large cities, however, independent grocers are a vital part of the urban fabric. In Toronto, for example, neighborhoods such as Greektown, Little Portugal, and Little India have many independently operated food stores offering a mix of healthy food choices. These types of food opportunities are not as frequent in places such as Buffalo, Las Vegas, or St. Louis. This study asks, when local or neighborhood grocers are added to the formula of regional and national grocers do food deserts exist in cities such as Toronto? The findings show that when small, independent grocers are not included in food desert analysis spatial gaps in food opportunities seem to exist. Conversely, the inclusion of small, independent grocers reveals that many of the food desert gaps in Toronto that would exist seem to disappear or lessen in spatial extent. Studying niche grocery stores is important in defining the context and extent food desert geographies.

UNFRIENDLY INFRASTRUCTURE: AN URBAN SOCIO-ECOLOGICAL STUDY OF ELDERLY PEDESTRIANS' RISKS IN SOUTH FLORIDA

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Abstract

Numerous studies have recognized and examined the factors that render elderly populations residing in urban areas vulnerable to traffic-related injuries. In South Florida, elderly pedestrians' vulnerability is well-known for being an especially glaring problem, as reflected by the disproportionately high rate at which elderly pedestrians are injured or killed by motor vehicles. Additionally, research inquiring into the socioeconomic background of these victims reveals that low-income residents and minorities make up a disproportionately high percentage of these documented cases. This paper takes a cue from a growing body of work calling for expanding the scope of urban ecology in a way that incorporates questions about the everyday living spaces of urban dwellers and how they negotiate built environments. This paper outlines an urban socio-ecological framework for examining the high-risk environment created by South Florida's car-oriented urban infrastructure converging with socioeconomic factors and particular needs of elderly pedestrians.

Keywords: elderly, Florida-South, pedestrians, socio-ecological, transportation

URBAN GARDENING STRATEGIES FOR MANAGING AND MITIGATING URBAN SOIL CONTAMINATION

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Abstract

As food issues gradually gain broader attention, urban gardening has become increasingly popular. Unfortunately, urban areas have been and continue to be foci of industrial processes, air pollution, and other practices that lead to accumulation of contaminants in urban soils. Gardeners may or may not be aware of the potential danger lurking in their yard and those that do have limited access to expensive and effective soil testing services. To address this issue, tools can be employed for reducing risk of exposure and limiting plant uptake of toxins including land use histories, crop selection, pH control, mycoremediation, and addition of organic matter. Moreover, some crops can provide soil remediation while maintaining the ability to harvest and consume the fruit. Case studies are presented for urban gardens with different land use histories (linked to elemental analyses) and recommendations are made for plot management to address common issues such as lead contamination. A collection of strategies for the average urban gardener are presented as an alternative to expensive soil testing.

Key words: urban gardens, heavy metals, soil remediation, urban soil quality

URBANIZING IMPACTS ON THE MAXWELTON SINK CAVE SYSTEM

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Abstract

As karst watersheds, those typified by caves, sinkholes, and sinking streams are increasingly urbanized, there exists a need for the evolution of inexpensive and accessible methods to evaluate and inventory human-environment impacts at various scales. These sensitive environs are progressively being disturbed and impaired by anthropogenic processes both economic and cultural, such as land use and new development, which are evidenced in the physical environment. Very little work has focused on these issues in urbanizing, karst subwatersheds, particularly from a spatial or holistic approach that examines the varied biological, social, and physical interactions that contribute to these impacts.

Lewisburg, West Virginia lies in a well developed karst watershed of the Appalachian Basin and has experienced increased urban development and expansion of agricultural lands and the built environment over the last ten years, resulting in the emergence of sinkholes, water table drawdown, sedimentation of surface and groundwater systems, changes in infiltration and runoff morphology, and negative impacts on cave biota. The Greenbrier Limestone (Big Lime) is a representative and extensive cave-forming unit in this region and creates many challenges for understanding the surface-subsurface links and resulting impacts of urbanization, as well as providing an abundance of opportunities for this exploration. This research addresses the recharge area for Maxwellton Sink Cave System and attempts to quantify and catalogue impacts from increasing development and changes in land use via the use of a Karst Disturbance Index (KDI) that incorporates and ranks regional influences based on geomorphology, atmosphere, hydrology, water quality, biota, and cultural components. Resulting scores allow for identification and discourse of impacted areas, as well as those that require more evaluation or protective measures.

Keywords: caves, water quality, karst disturbance index

USE OF HIGH-RESOLUTION PUBLIC IMAGERY TO ASSIST IN HABITAT IDENTIFICATION AND WILDLIFE MONITORING EFFORTS: A CASE STUDY OF CONCHO WATER SNAKE HABITAT

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Abstract:

Habitat suitability maps created from aerial or satellite-based imagery are an important resource for agencies tasked with monitoring, managing, and ensuring habitat conservation for various endangered and threatened species. Remotely sensed imagery serves as a synoptic visual resource and is often employed in an operational manner to provide current information related to land cover and land use for landscapes of interest. In addition, imagery can assist with up-to-date monitoring strategies and promote rapid characterization of potential habitat to aid in field campaigns and monitoring efforts.

This study investigates the use of free, high-resolution imagery to identify in-stream riffle locations and adjacent land cover associated with Concho water snake habitat in Texas. Natural color and near infrared image datasets were employed to geolocate riffles along a 62 km stretch of the Colorado River in Texas. The same image datasets were used to perform a maximum likelihood classification to characterize broad land cover classes and vegetation cover within a restricted buffer of the river. Image interpretation and processing resulted in 37 riffles identified over a 62 km river segment and an overall thematic classification accuracy of 66 percent. This study provides a simple imagery-based framework to identify potential Concho water snake habitat and focus fieldwork efforts necessary for monitoring snake populations.

We will present the methods and results of our image interpretation and analysis as well as challenges encountered in the study. The framework used to identify potential monitoring sites may be applied to similar species that require aquatic habitat and riparian vegetation cover.

Key words: Biogeography, remote sensing, GIS

USE OF TERRAIN MODELS IN A GEOGRAPHIC INFORMATION SYSTEM TO IDENTIFY LANDSCAPE EROSION IN THE UPPER DEVILS LAKE BASIN, NORTH DAKOTA

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Abstract

Soil erosion modeling using terrain analysis holds great potential due to the simplicity of the models, and the ease in running the analysis in a GIS. Terrain analysis of the upper Devils Lake basin was conducted using a 3-meter LiDAR-derived digital elevation model. Portions of the Mauvais Coulee and Calio Coulee watersheds in the basin were analyzed to evaluate soil erosion potential and determine if terrain analysis is an accurate tool for modeling erosion in this fairly flat landscape. The analysis used slope, flow accumulation, and stream power index (SPI) within a GIS to identify highly eroded areas. The study found that 1.5% of the 262.8 km² study area exhibited channelized erosion. It was determined that the terrain analysis accurately identified 92 (79%) of the 116 survey points established for field verification. Finally, the findings show that the use of terrain analysis for erosion modeling in the Devils Lake basin is highly accurate, and can be a useful tool in locating and implementing best management practices (BMPs) to aid in the reduction of surface runoff entering Mauvais and Calio Coulees from channelized erosion.

Key words: soil erosion, GIS, terrain analysis

USING A TERRESTRIAL 3D LASER SCANNER AS A TOOL TO ENHANCE UNDERGRADUATE GEOGRAPHY CURRICULUM

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Abstract

Terrestrial 3D laser scanners are tripod-mounted active remote sensing instruments that generate precise digital representations of surfaces and objects. In academia, the scanners are typically used as data collection devices to support research. This paper demonstrates how the scanners can also support undergraduate geography curriculum by helping students conceptualize an array of fundamental geospatial concepts. Based from the teaching experiences of the author, the paper outlines how scanner use can enhance geographic information systems (GIS), remote sensing, and geomorphology courses. Working with a scanner and processing and analyzing its data enables students to experience first-hand some of the concepts surrounding active remote sensing, lidar technology, data registration, data interpolation, spatial and spectral resolution, raster and vector data models, triangular irregular networks, 2D versus 3D data, data visualization, landform mapping, geomorphometry, and landform change detection.

Key words: Undergraduate geography curriculum, teaching geospatial concepts, 3D laser scanning

USING A CELLULAR AUTOMATA URBAN GROWTH MODEL TO ESTIMATE THE COMPLETENESS OF AN AGGREGATED ROAD DATASET

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Abstract

This research will demonstrate how urban growth forecasting models based on cellular automata can be applied to estimate omission of features in a geographic dataset where new development has occurred since the dataset was last compiled. Using the National Land Cover Dataset and TIGER/Line road networks, we will show how to calibrate a cellular automata urban growth model to predict where new urban development is happening and determine where datasets may need to be updated more frequently. Measuring the completeness of a spatial dataset traditionally requires detailed comparison to a higher-quality dataset or to imagery. Spatial data aggregators, such as the Census Bureau, may be able to save expenditures by using GIS models to estimate where data is missing and supplementing datasets with updates from local data providers, imagery, or ground surveys in a more targeted fashion.

Keywords: urban growth forecasting, urban modeling, cellular automata, change prediction, National Land Cover Dataset, TIGER,

USING GIS TO EXAMINE EVACUATION NEED AND SHELTER LOCATIONS IN BROWARD COUNTY, FLORIDA

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Abstract

The identification of temporary hurricane shelters for evacuees is an important component of hurricane preparedness. Since individuals have different levels of evacuation need, based on their access to crucial resources or lifelines, their socioeconomic status and their demographic characteristics, the evacuation need of a population varies across space.

Evacuation need is assessed quantitatively for all census tracts in Broward County, Florida through the development of an Evacuation Need Index or the ENI. The ENI is calculated by incorporating 11 variables categorized into 3 broad indicators into a model. Moran's I local cluster analysis is used to identify significant clusters of high evacuation need. Housing vulnerability is incorporated into the model by analyzing the distribution of mobile homes and recreational vehicle parks in Broward County. Schools that lie within the high evacuation need clusters and that are easily accessible from major arterial networks are identified as suitable hurricane shelters.

Results of the study indicate presence of 3 significant clusters of high evacuation need. Housing vulnerability exhibits dominant north-south directionality. 40 schools are identified as possible shelter locations. Final choice of shelters depends on attributes such as school capacity and structural strength of the buildings.

This paper explores the utility of geospatial data and GIS spatial analysis techniques in emergency management. The use of geospatial data to create the ENI and the ability of a GIS to identify distribution of evacuation need is simply one of the many examples of how GIS can aid emergency managers in the decision making process.

USING TERRESTRIAL PHOTOGRAPHY TO MEASURE STREAM MORPHOLOGY

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Abstract

The ability to properly identify stream channel morphology is an essential tool for all fluvial geomorphologists and river scientists. Research compared measurements from traditional stream channel survey to a terrestrial photography technique that evaluated geomorphic variables from stream channels. Statistical results show that a photographic methodology accurately measures and illustrates parameters considered in this study. Classification systems were created to identify dominant bed material and physical habitat for ten vegetative (5 forested/ 5pastured) streams surveyed. This scientific technique was performed on streams within the southern Blue Ridge Mountains near Coweeta Long Term Ecological Research Center.

Key Words: Stream Morphology, Terrestrial Photography, Techniques in Fluvial Geomorphology, Channel Monitoring, Photo Documentation

VIRTUAL WATER AS A DRIVING FORCE FOR LAND CHANGE IN THE HIGH PLAINS AFTER 1950

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Abstract

Water is as important to life as is the land we live on. Humans need both to produce food. Over the last century the human population grew rapidly and with it the demand for food and water which has caused water shortages in several regions. Virtual water, all water needed to create a product, is one possible solution.

The United States is one of the major exporters of virtual water because of its large exports of agricultural products. The High Plains area is one of the main agricultural areas for crops, meat, and dairy products. Virtual water content and quantity exported on a county scale are used to estimate virtual water export.

Results of virtual water export of agricultural products in the High Plains region will show the connection between virtual water and land change and the impact of that change on the environment.

Keywords: virtual water, land change, High Plains, water footprint

WE WALK FOR THE WATER: A CASE STUDY ON THE GEOGRAPHIES OF INDIGENOUS PEOPLES

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Abstract

History tells us that transformative social movements often begin with that first significant step. This paper reports on one of the most ambitious environmental advocacy actions to take place on the North American continent, the Mother Earth Water Walk 2011. From the four cardinal directions, walkers trekked thousands of miles across the United States and Canada to raise awareness about the need to protect Earth's "sacred waters" for the generations to come. The western walkers launched the Water Walk on April 10, 2011 in Aberdeen, Washington. The southern, eastern, and northern walkers, including the author, began their walks on other sequentially planned dates. The Water Walk ended on June 12, 2011 when all four directions converged at the Bad River Ojibwe Reservation in Northern Wisconsin for an international ceremonial meeting. Related civil actions in 2012 continue to raise awareness and to advocate for social environmental change to safeguard water quality.

Keywords: human rights, indigenous peoples, sacred lands, water

WHAT ARE WE 'TWEETING' ABOUT OBESITY? AN EXPLORATION OF TOPIC MODELING AND SPATIAL ANALYSIS

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Abstract

Public health related tweets are difficult to identify in large conversational datasets like twitter.com. Even more challenging is the visualization and analysis of the spatiotemporal patterns encoded in tweets. This study, first examines how to model and discover public health related themes in tweets and second, analyzes the spatiotemporal patterns of these themes. Obesity is chosen as a test theme to demonstrate the effectiveness of topic modeling using LDA (Latent Dirichlet Allocation) and spatial temporal analysis using Geographic Information System (GIS) techniques. The dataset used is a representative dataset from the United States that is constructed from obesity-related queries such as, 'food deserts', 'high fructose corn syrup', 'fast food', 'childhood obesity', 'soft drinks', and 'weight gain'. The conversations or the "tweets" are also georeferenced (location of tweets and users) and time stamped (specific time/day the tweets are posted by the user). Four cluster of topics or themes such as 'childhood obesity and schools', 'obesity prevention', 'obesity and fast food', and 'obesity and health' are extracted from the LDA model. The spatiotemporal pattern of the extracted topics show distinct pattern between rural and urban areas, northern and southern states, and between coasts and inland states. Further, positive association of topics with the location of schools and fast food places confirms the effective combination of topic modeling and GIS. The methods used in this study provide a possible toolset for computational social scientists in general and health geographers and public health researchers in specific to better understand health problems through large conversational datasets.

Key words: Social media, topic models, GIS, text mining, obesity

WHAT'S MAPPABLE? FACTORS IN THE GROWTH OF VOLUNTEERED GEOGRAPHIC INFORMATION

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Abstract

Collaborative mapping databases allow individuals to share location information for manmade and natural objects. Any object at any location on the globe may be subject to mapping – how are objects chosen to be represented in a cartographic database? While the decision to map an object is personal to the individual, the collective mapping data suggests that there are social, demographic, and economic factors across the landscape that influence where and what is chosen for collaborative mapping projects. In this paper, we determine what factors influence the growth of Volunteered Geographic Information (VGI). Geographically Weighted Regression and spatial autocorrelation indices are used to compare OpenStreetMap collaborative mapping data to local United States Census demographic variables. By knowing which local factors influence collaborative mapping data gathering, locations with incomplete mapping information could be more easily determined.

Key words: Volunteered Geographic Information (VGI), Collaborative mapping, Geographic Information Science

WORLD REGIONAL GEOGRAPHY: FIFTEEN YEARS OF STUDENT PREFERENCES

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Abstract

World regional geography textbooks are typically organized around ten to twelve distinct regions. While the defined regions are consistently comparable, their order of presentation varies from publication to publication. Over the past fifteen years, we have encouraged our world regional students to select and rank their own order of preference for regional discussions in our classes. Our combined courses have collected data from over 1500 world regional students at six universities in five states (Illinois, Minnesota, North Carolina, Pennsylvania and Texas). Multidimensional scaling analyses are used to explore student preference patterns. Student rankings of regions vary widely and reflect both spatial and temporal components. Preference patterns reveal local cultural influences, as well as student awareness of current global issues. Other recognizable patterns include the increasing ethnic diversity of student populations.

Key Words: geographic education, student preferences, world regions