

# Final Conference Program

## URISA's 2013 GIS in Public Health Conference

June 17-20, 2013

Hyatt Regency – Miami, Florida

**Conference Vision:** To provide an open and participatory forum for advancing the effective use of spatial information and geographic information system technologies across the domains of public health, healthcare and community health preparedness.



## Welcome to Miami

The Urban and Regional Information Systems Association (URISA) is pleased to present the 2013 GIS in Public Health Conference in Miami, Florida!

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Founded in 1963, URISA - *The Association for GIS Professionals* - is a leading provider of learning and knowledge for the GIS community. URISA connects great ideas and great people to inspire leadership and achievement. We strive to provide exceptional educational experiences, a vibrant and connected community, and the essential resources you need to be successful in your career. URISA is a multidisciplinary association where professionals from all parts of the spatial data community come together to share concerns and ideas. *For more information, visit [www.urisa.org](http://www.urisa.org).*

### Registration Information

Registration for the conference is on the Lower Promenade – Terrace Level of the Hyatt Regency Miami.

Onsite registration schedule:

- Monday, June 17: 7:30 AM – 5:00 PM
- Tuesday, June 18: 8:00 AM – 6:00 PM
- Wednesday, June 19: 8:00 AM – 4:30 PM
- Thursday, June 20: 8:00 – 11:30 AM



GISCI Certification points earned for attending one workshop and the Public Health Conference = 0.5 GISCI education points. For more information about GIS professional certification, visit [www.gisci.org](http://www.gisci.org).

## Conference Committee

The volunteers who serve on the conference committee are vital to the success of the program. They contribute both their time and expertise to develop an educational program that is important and powerful. Thank you!

**Chair:** Jason K. Blackburn, PhD, MS – University of Florida

**Immediate Past-Chair:** Russell Kirby, PhD, MS, FACE - University of South Florida

### **Program Committee Members:**

- Angelica Baltazar - Esri
- Janice Burns - Healthy City
- Michael Dow - Tennessee Department of Health
- Kevin Gibbs - University of Illinois at Chicago's Health Policy Center
- Daikwon Han - Texas A&M School of Public Health
- Timothy Hare - Morehead State University
- Paul D. Jaurez- Meharry Medical College
- Carl Kinkade, GISP – Centers for Disease Control and Prevention
- Uriel Kitron – Emory University
- C. Virginia Lee, MD, MPH, MA – Centers for Disease Control and Prevention
- Melissa Lemke - Center for Urban Population Health – UW-Milwaukee
- John Malone - Louisiana State University
- Koren P. Melfi, MPH, Altarum Institute
- Alan Melnick - Oregon Health & Science University
- Adrienne Perry - San Diego County
- Marilyn O'Hara Ruiz - University of Illinois
- Christine Schweidler - Advancement Project
- Seth Spielman – University of Colorado
- Justin Stoler – University of Miami
- James Tobias, GISP – Northrop Grumman
- Michael Wimberly – South Dakota State

If you wish to participate on the committee to organize future URISA GIS in Public Health conferences, sessions webinars or workshops, please let us know!

#### URISA Staff Onsite

Wendy Nelson – Executive Director  
Patricia Francis – Meeting Coordinator

## Conference-at-a-Glance

### **Monday, June 17, 2013**

#### *Pre-Conference Workshops:*

- 8:30 AM-5:00 PM An Overview of Open Source GIS Software
- 8:30 AM-12:00 Noon Detecting Clusters of Adverse Health Outcomes using SaTScan™
- 1:00-5:00 PM Geospatial Data Collection for Micro-Environments and Multiple Time Periods: The Use of Spatial Video

### **Tuesday, June 18, 2013**

- Keynote Address – Big Data and Public Health  
*Estella “Este” M. Geraghty, MD, MS, MPH, FACP, GISP*
- Educational Sessions
- Conference Luncheon
- Networking Reception & Poster Session

### **Wednesday, June 19, 2013**

- Educational Sessions
- Poster Session
- Conference Social Event

### **Thursday, June 20, 2013**

- Educational Sessions
- Closing Keynote Address - Health, Disasters and Crime:  
Working Geospatially at the “Scale” of Intervention  
*Andrew Curtis, Director, GIS | Health & Hazards Lab, Kent State University*

## Conference Proceedings

Approximately eight (8) weeks after the conference, attendees will receive an email notification with instructions for access to the Conference Proceedings.

Speakers: A formal paper is not required, but it is encouraged as part of the Proceedings. Please email Pat Francis (pfrancis@urisa.org) a PDF file of your formal paper and/or presentation for the Proceedings as soon as possible during or after the conference.

**Thank you to all speakers and poster presenters for sharing their research, knowledge and ideas during this important educational event.**

## Pre-Conference Workshops

### Monday, June 17, 2013

Begin the 2013 URISA GIS in Public Health Conference by taking a pre-conference workshop. If you pre-registered for a workshop, a workshop ticket was included in your registration materials. If you did not register for a workshop, please ask about availability at the registration desk.

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#### **An Overview of Open Source GIS Software – A URISA Certified Workshop**

**8:30 AM - 5:00 PM**

**Room: Hibiscus A**

*Instructor: Carl Anderson, GISP, Spatial Focus, Inc., Sarasota, Florida*

Free and open source software (FOSS) has been offering choices to computer users for a number of years. The open source choices in GIS are broader and more capable than ever before. This workshop will focus on GIS open source software. It will give an overview of current developments from technical and management perspectives. Selected packages and their applications in various projects will be demonstrated and discussed.

Specific topics include:

- Open Source GIS background and development
- Overview of Open Source GIS spatial functionalities
- Live demonstration
- Interoperability: The Open Source GIS spectrum
- Planning and implementation issues

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#### **Detecting Clusters of Adverse Health Outcomes using SaTScan™**

**8:30 AM – 12:00 Noon**

**Room: Hibiscus B**

*Instructor: Thomas Talbot, Chief of Environmental Public Health Surveillance Section, New York State Department of Health*

This workshop will introduce participants to SaTScan™ software (<http://www.satscan.org>). SaTScan™ is free and has been widely used to perform geographical surveillance of a variety of adverse health outcomes by detecting spatial and space-time clusters and assessing the statistical significance. Participants will learn the statistical principles behind the method, how to properly format their data, and how to display the results in a GIS or a Google map.

The hands on training will use examples from the recently released block-group level cancer incidence data from New York State. Participants will need to bring their Laptop computer to the training. The software, sample data sets and training materials will be provided on flash drives at the workshop. Participants are also encouraged to bring their own data sets.

The focus of this course will be on the application of shareware solutions to these issues, with theoretical and methodological perspectives, applications and hands-on examples.

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#### **Geospatial Data Collection for Micro-Environments and Multiple Time Periods: The Use of Spatial Video**

**1:00 – 5:00 PM**

**Room: Hibiscus B**

*Instructors: Andrew Curtis and Jacqueline Mills-Curtis, GIS, Health and Hazards Lab, Department of Geography, Kent State University, Kent, OH*

At the end of this workshop, participants will have an understanding of how to use a spatial video approach in their research, and have enough training to immediately begin the collection, coding and analysis of their own primary data. This workshop will introduce a systematic and cost-effective data collection technology, spatial video, as well as a methodological approach that involves the creation of new spatial layers derived from spatial video surveys.

These data will be created in Google Earth and in a GIS. The means to geographically analyze these video-into-GIS data will also be described. This workshop will begin with several examples drawn from ongoing health and hazards projects being conducted through the GIS, Health & Hazards Lab at Kent State University (<http://www.kent.edu/ghhlab/index.cfm>). These case studies will then frame a detailed step-by-step progression through technology use to spatial analysis. The workshop will also include an exercise in video coding using real spatial video data. Finally, the workshop will conclude with a general discussion involving related topics such as spatial video as a geonarrative tool, and importantly, ethical considerations.

**Tuesday, June 18, 2013**

## Welcome & Keynote Address

9:00 – 10:00 AM

Room: Jasmine



2013 Conference Chair, Jason Blackburn (University of Florida) will welcome delegates and discuss some of the highlights of the conference program. We are honored to welcome Dr. Estella Geraghty, as our distinguished keynote speaker. She will discuss “Big Data and Public Health”.



Estella “Este” M. Geraghty, MD, MS, MPH, FACP, GISP

Dr. Geraghty recently was named Deputy Director of Health Information and Strategic Planning for the California Department of Public Health. She is also a clinician researcher in the Division of General Medicine at UC Davis. Her research focuses on using GIS to influence health policy and advance community development programs. She has co-authored research in pesticide exposure modeling, statewide mental health service access and use tracking systems; asset and disparity mapping of youth outcomes, and index development for youth well-being and vulnerability. Dr. Geraghty is the recipient of the Larry L. Sautter Golden Award for Innovation in Information Technology as a part of a team developing an electronic medical record data discovery solution. In addition to her degrees in Medical Informatics and Public Health, Dr. Geraghty is a certified Public Health professional (CPH) and a Geographic Information Systems Professional (GISP).

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**Networking Coffee Break - 10:00 – 10:30 AM**

## Educational Sessions

10:30 AM – 12:00 Noon

Attendees may choose the topic of most interest to them. Full conference attendees may attend any of the breakout sessions (no additional registration required for individual sessions).

### Health Services – Location

Room: Hibiscus A

Determining the optimal location of health centers directly correlates to a community’s overall health. Learn how GIS facilitates that process in this session.

Session Moderator: Daikwon Han, Texas A&M Health Science Center

- Defining Service Areas for Federally-funded Community Health Centers in the United States  
Jennifer Rankin, PhD, Robert Graham Center, Washington, DC
- Carolyn Fahey, BS, Robert Graham Center, Washington, DC
- Using GIS Spatial Statistic Tools for Evaluating the Location of Health Centers in Jeddah City  
Abdulkader Murad, King Abdulaziz University, Saudi Arabia

### Disease Ecology – Vector

Room: Hibiscus B

A number of key human diseases, such as malaria and dengue fever, are transmitted by arthropod vectors. Successful disease transmission occurs at the intersection of ecological and built environments. This session will focus the use of GIS and modeling to understand mosquito-borne diseases.

Session Moderator: Pat Boda, Middle Tennessee State University

- Macro Mapping of Dengue Virus Vector  
Lynette Akong, Bsc, Msc, Ministry of Planning and Sustainable Development, Trinidad and Tobago
- The Influence of Environmental Factors on the Key West (Florida) DF Outbreak  
Meredith Phillips, MPH(c), BS, Graduate Assistant, Georgia Southern University, Macon, GA
- Brian Bossak, PhD, MPH, Division Director of Environmental Health Sciences, Georgia Southern University, Statesboro, GA
- Modeling Risk of Exposure to Malaria Vectors  
Temitope Alimi, PhD Student, University of Miami, Coral Gables, FL

### Remote Sensing

**A Partnership: National Aeronautics and Space Administration (NASA) and Centers for Disease Control and Prevention (CDC)**

Room: Gardenia

This session will detail three collaborative projects between CDC and NASA demonstrating how satellite observations can be used to characterize environmental hazards and link these to specific health outcomes.

Session Moderator: Sue Estes, NASA/ USRA

- Overview of the CDC/NASA Partnership for the Past 10 Years and the EPHT Climate Change Portal  
Lina Balluz, Centers for Disease Control and Prevention
- Enhancing EPHT with Satellite-Driven PM2.5 Exposure Modeling and Epidemiology  
Yang Liu, Emory University
- Using Remotely Sensed Data to Evaluate the Effects of Air Quality on Asthma in the Presence of Forest Fires  
Mohammad Al-Hamdan, Universities Space Research Association, Huntsville, AL
- A Long-term Data Set of Daily Extreme Heat Metrics for Public Health Surveillance in the U.S  
Bill Crosson, PhD, Universities Space Research Association, Huntsville, AL

**12:00 Noon – 1:30 PM**

### **Roundtable Discussion Luncheon**

**Room: Jasmine**

Fill a plate for lunch and proceed to the discussion topic that most interests you. This is a great way to network with your fellow participants and learn something new!

The topics and corresponding table numbers follow:

1. Privacy - *How to do health research without violating confidentiality?*
2. Healthy Living - *How to encourage the public toward a healthy lifestyle?*
3. Disaster Response
4. Environment and Health
5. Open Source Solutions
6. Infectious & Food-Borne Disease Outbreaks
7. Mental Health Issues
8. Urban Health Issues
9. Pandemic Viruses – West Nile, Avian, H1N1/Swine Flu
10. Healthy Mothers and Healthy Babies
11. Poverty and Public Health
12. Crime and Violence
13. PPGIS & Volunteered Geographic Information
14. Grants, Funding Ideas
15. Travel, Foodie Talk
16. Sports (Spurs/Heat or Bruins/Blackhawks)!
17. Anything but GIS & Public Health!

### **Educational Sessions**

**1:30 – 3:00 PM**

#### **Health Services**

**Room: Hibiscus A**

This session will examine aspects of location and availability of health care services in relation to socio-economic and environmental factors within the urban context.

*Session Moderator: Michael Stiehl, Northwestern University*

- Availability of Community Health Centers and Access to Preventive Care Services in 12 Metropolitan Areas Across the United States  
*Roengrudee Patanavanich, PhD Student, Department of Public Policy, University of Maryland, Baltimore, MD*
- Using Maps to Explore the Question: Does Residential Segregation Hurt or Help the Mental Health of African-Americans?  
*Dr. Lorraine Dean, University of Pennsylvania, Department of Biostatistics and Epidemiology, Philadelphia, PA*

#### **Disaster GIS Roundtable**

**Room: Hibiscus B**

Natural disasters are often sudden and present immediate stresses on public health infrastructure, in addition to the community or region impacted. These immediate hazards then turn into long-term health risk and community strain as infrastructure are slowly rebuilt and health services brought back to full capacity. These issues are often times amplified in developing countries where health delivery and infrastructure are limited or lacking before disaster strikes. This session will focus on the roles of GIS and other metrics for evaluating disaster impact and community resilience.

- *Andrew Curtis, GIS Health and Hazards Lab, Kent State University, Kent, OH*
- *James M. Shultz MS PhD, Director, Center for Disaster & Extreme Event Preparedness (DEEP Center), Miami FL*
- *The Healthcare Infrastructure of Leogane, Haiti: A Pre and Post- Earthquake Analysis Using Geographic Information Systems*  
*Maxwell Kligerman, Stanford University School of Medicine, Palo Alto, CA*

#### **Remote Sensing – Environmental Pathogen Reservoirs**

**Room: Gardenia**

This session will focus on the use of remote sensing tools to understand the ecology of pathogen reservoirs. Specifically, speakers will use examples from *Bacillus anthracis*, the causative agent of anthrax, to illustrate roles for spatial and temporal analyses of ecological conditions that support anthrax outbreaks in livestock and wildlife.

*Session Moderator: Jason Blackburn, University of Florida*

- *Spatial Patterns and Ecological Factors Associated with Livestock Anthrax in Osh, Kyrgyzstan*  
*Lindsay Bell, University of Florida, Gainesville, FL*
- *Differentiation of Springtime Vegetation Indices Associated with Summer Anthrax Epizootics in West Texas, USA Deer*  
*Jason Blackburn, PhD, Spatial Epidemiology & Ecology Research Lab, University of Florida, Gainesville, FL*

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**Networking Coffee Break - 3:00 – 3:30 PM**

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### **Educational Sessions**

**3:30 - 5:00 PM**

#### **Neighborhood Effects on Food & Water Security**

**Room: Hibiscus A**

People are considered food or water secure when they have regular access to sufficient, safe, nutritious food to maintain a healthy and active life, yet gross disparities in food security exist in both urban and rural communities. This session demonstrates the use of geospatial frameworks to explore how various neighborhood characteristics, such as land use and municipal service rationing, are related to disparities in food and water access.

*Session Moderator: Antonio Blazevec, GISP*

- *Equitable Communities? A GIS Spatial Analysis of Unhealthy Characteristics Around Neighborhoods*  
*Gina Besenyi, PhD Student, Arnold School of Public Health, University of South Carolina, Columbia, SC*
- *Drinking Water in Transition: Sachet Water Consumption and Accra's Urban Poor*  
*Justin Stoler, PhD, MPH, Department of Geography and Regional Studies, Department of Public Health Sciences, University of Miami, Coral Gables, FL*

## Disease Ecology

### Room: Hibiscus B

Understanding disease risk is inherently linked to environmental conditions that support pathogen or parasite survival and opportunity for host invasion. Those conditions can be ecological or demographic/built environment, depending on the nature of the disease and natural history of the pathogen. This session will focus on geospatial techniques for modeling environments that promote disease transmission.

*Session Moderator: Jessica Brehmer, Minnesota Department of Health*

- Network & Spatial Correlates of Active Syphilis Among IDUs in Tijuana, Mexico  
*Abby Rudolph, PhD, MPH, Research Scientist, Pacific Institute for Research and Evaluation, Calverton, MD*
- Modeling the Spatial Risk of Human Onchocerciasis in Ghana and Burundi  
*Alassane Barro, PhD Student, University of Florida, Gainesville, FL*
- Measuring inter-annual Dynamics of the Trans-Caucasian Low-land Plague Focus in Azerbaijan Using Historical Maps and Spatial-Temporal Analysis of Moving Polygons (STAMP)  
*Lillian Morris, University of Florida, Gainesville, FL*

## Web GIS

### Room: Gardenia

Web-based GIS has been around for years but with improved networks, accessibility from most homes, and the ubiquitous nature of web applications via desktops, tablets, and smartphones, it has flourished in recent years. Information is at our fingertips more than any time in history. This session will discuss web-based GIS applications to access health information in South Africa and Los Angeles. In addition to accessing health information via the web, these presentations will illustrate how GIS desktop functionality can be distributed via a web application to support users from across the community.

*Session Moderator: Mohammad Al-Hamdan, USRA*

- Appropriate Web GIS for A Coordinated Response to HIV/AIDS Challenge  
*Taurai Bwerinofa, Msc in GIS and Environment, Spatial Data Analyst, John Snow Inc, South Africa*
- Los Angeles County Department of Public Health GIS Map Viewer  
*Douglas Morales, MPH, Epidemiologist/GIS Coordinator, Los Angeles County Department of Public Health, Los Angeles, CA*

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## Networking Reception and Poster Session

### 5:00 – 6:00 PM

Take advantage of this informal time for refreshments and discussions with poster presenters at this year's conference.

Read through the poster abstracts (beginning on page 13).

Thank you to all of the poster presenters who are sharing their work with us during the conference. Congratulations!

## Are you a URISA Member?



Join while you're at the conference!

## Thank you to Our Gold Conference Sponsor



[www.esri.com](http://www.esri.com)

Esri is the world leader in geographic information systems (GIS) technology. Esri software promotes integrating, visualizing, and analyzing massive amounts of information. From identifying vulnerable populations for preparedness planning to displaying the real-time locations of emergency response resources, GIS is a powerful tool for rapid needs assessment and decision making. Public health preparedness officials use spatial analysis tools for situational awareness, disease pattern identification, and emergency resource allocation. Esri software is extensively used by public health organizations worldwide, including the US CDC, all 50 U.S. state health departments, the WHO, more than 500 hospitals, and 120 national ministries of health.

**Wednesday, June 19, 2013**

**Educational Sessions**

**8:30 AM – 10:00 PM**

**Travel Time & Health Care Access**

**Room: Hibiscus A**

This session will explore dimensions of accessibility to health care in several contexts, exploring the utility of GIS in concert with transportation databases and Euclidean geometric approaches.

*Session Moderator: Russell Kirby, University of South Florida*

- Role of GIS and Estimating Travel to Hospitals for Infants with Spina Bifida  
*Eric Delmelle, PhD, MS, MA, Assistant Professor, University of North Carolina at Charlotte, Charlotte, NC*  
*Russell Kirby, Ph.D., MS, FACE, Professor and Marrell Endowed Chair, University of South Florida, Tampa, FL*
- Comparing Primary Care Service Areas to Estimated Drive Times  
*Jennifer L. Rankin, PhD, Geospatial Informatics Senior Analyst, The Robert Graham Center, Washington, DC*
- Assessing Geographical Inaccessibility to Health Care: Using GIS Network Based Methods  
*Sudha Yerramilli, Ph.D., National Center for Biodefense Communications, Jackson State University, Jackson MS*

**Disease Ecology – Animal Diseases**

**Room: Hibiscus B**

Zoonotic diseases, those that cross the animal/human interface, and animal diseases pose a serious threat to human and animal health and require improved surveillance and management strategies. This session will illustrate the role of GIS and spatial modeling in understanding disease patterns in wildlife and livestock.

*Session Moderator: Jason Blackburn, University of Florida*

- Informing Zoonosis Surveillance with Animal Movement Ecology: Tracking Elk during the Montana Anthrax Risk Period  
*Jason K. Blackburn, PhD, Assistant Professor, University of Florida, Gainesville, FL*
- Integrating High-Resolution Genotyping and Spatio-Temporal Analysis to Understand Anthrax Ecology in North American Wildlife  
*Jocelyn C. Mullins, DVM, PhD, MPH, Graduate Researcher, University of Florida, Gainesville, FL*
- A Spatio-Temporal Risk Assessment of Hemorrhagic Disease Exposure in Cattle in Illinois  
*Varun Goel, University of Illinois-Urbana, Urbana, IL*

**Mobile GIS**

**Room: Gardenia**

Mobile technology is growing throughout society and it is no different in the healthcare and public health industries. The use of Mobile technology to access information or to have information pushed to you is becoming not only a common practice but an expected practice. With mobile GIS, organizations can integrate mobile technology with location to deliver a vast array of services. In addition to accessing health content via a mobile device, mobile devices are being used more than ever to collect public health information rather than using paper. This session will discuss mobile applications for chronic disease self-management and illustrate how mobile devices can be used to collect data in the field electronically rather than using paper.

*Session Moderator: Andrew Curtis, Kent State University*

- Mobile Maps in Healthcare Apps  
*Deborah Vollmer Dahlke, MPAff Director, Texas Life Science Foundation, Austin, TX*
- Development of Health Information in Community Based on Geographical Information  
*Waraporn Boonchieng, Public Health Nursing, Assistant Professor, Chiang Mai University, Thailand*  
*Ekkarat Boonchieng, Associate Professor, Chiang Mai University, Thailand*

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**10:00 - 10:30 AM – Networking Coffee Break**

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**Educational Sessions**

**10:30 AM – 12:00 Noon**

**Socio-Demography and Health**

**Room: Hibiscus A**

Social and demographic characteristics influence our behaviors and communities, often interacting with the environment to produce (un)healthy outcomes. Demographic information is also a critical piece of modern public health surveillance systems. This session will demonstrate how various individual and community factors shape health behaviors at various scales and can inform public health interventions.

*Session Moderator: Bernadette de Leon, Indiana University*

- Individual/ Neighborhood Correlates of Membership in HIV Prevalent Drug Networks  
*Abby Rudolph, PhD., M.P.H., Research Scientist, Pacific Institute for Research and Evaluation, Calverton, MD*
- Assessment of Individual Spatial Behavior: Results of the RECORD Cohort Study  
*Camille Perchoux, MSc, Ph.D. Student, UdeM / CRCHUM, Montreal, Quebec Canada*

**Environmental Exposures**

**Room: Hibiscus B**

The use of GIS in exposure assessment for environmental epidemiology studies can enhance the understanding of the association between contaminants in our environment and disease. This session demonstrates how classical GIS/RS approaches and new GPS-driven exposure assessments can unlock synergies in analyzing environmental data and aid in identification of vulnerable communities.

*Session Moderator: Thomas Talbot, New York State Department of Health*

- Radon In Schools  
*Stephanie Foster, MPH, MA, Epidemiologist, Centers for Disease Control, Atlanta, GA*
- Estimating Potential Exposures to Unhealthy Air Using Spatial Interpolation  
*Jeffrey Percy, MSc, Statistician, CDC/National Center for Health Statistics, Hyattsville, MD*
- Biofilms, Microbes, and Beach Water Quality: An Analysis of Florida Counties  
*Elizabeth Kelly, BA, MA, Student, University of Miami, Miami, FL*  
*Helena Solo-Gabriele, BS Civil Engineering, MS Civil Engineering, Associate Dean for Research, Professor of Civil Engineering, University of Miami, Miami, FL*

## Uses of GIS to Improve Community Health

### Room: Gardenia

GIS mapping can be a powerful means of organizing and presenting data in order to visualize community realities, model future possibilities, and track change over time. Residents of the Central-Cocanut neighborhood of Newtown are developing GIS resources through Sarasota Community Studio – resources that can be used by residents to lead community change efforts that begin at the neighborhood scale. The content and process associated with these efforts will be presented, emphasizing both successes and challenges encountered along the way.

*Session Moderator: Russell Kirby, University of South Florida*

- Using GIS as a Tool for Resident-Led Community Change  
*Tim Dutton, Sarasota, Community Studio, Sarasota, FL*  
*Allison Pinto, PhD, Sarasota Community Studio, Sarasota, FL*

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**Lunch on Own** - There are a variety of lunch options in the hotel and also within the immediate surrounding area. Be sure to come back to reconvene by 1:30 PM!

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## Poster Session & Refreshments

### 1:30 - 3:00 PM

Take advantage of this informal time for refreshments and further in-depth discussions with poster presenters. The poster abstracts begin on page 13.

**Poster Presenters:** The poster boards will be removed on Thursday morning. If you wish to keep your poster, please remove it by tomorrow morning, or it will be discarded.

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## Educational Sessions

### 3:00 – 4:30 PM

#### Toxic Waste/Environmental Exposure

##### Room: Hibiscus A

This session includes three presentations utilizing GIS and spatial analytic methods to assess levels of environmental and meteorological exposures.

*Session Moderator: Douglas Morales, Los Angeles County Department of Public Health*

- Personal Real-time Exposure and Cell-phone Integrated Spatial Environmental Data  
*Naresh Kumar, PhD, Associate Professor, University of Miami, Miami, FL*
- GIS-based Assessment of Urban Community Vulnerability to Extreme Weather Events  
*David Padgett, Ph.D., M.S., Associate Professor of Geography, Tennessee State University, Nashville, TN*  
*Nia Foderingham, M.D., M.S.P.H., M.B.A., Preventative Medicine Physician, Concentra Medical Centers, Nashville, TN*
- Use of Spatial Profiles to Characterize Multi-Pollutant Exposure Areas in an Urban Environment  
*John Pearce, Postdoctoral Fellow, Rollins School of Public Health, Emory University, Atlanta, GA*

#### Infectious Disease

##### Room: Hibiscus B

Geographic approaches have long aided our understanding of the spread of pathogenic agents and disease, and today GIS is routinely used for disease surveillance and outbreak control. Contemporary approaches incorporate space-time dynamics to model disease, and this session will highlight new methodological approaches for tracking disease emergence in both developed and underdeveloped nations.

*Session Moderator: Eileen Johnson, Bowdoin College*

- Spatial and Temporal Analysis of Bronchiolitis in England and Wales 2004 -2010  
*Lynette Akong, Bsc, Msc, Ministry of Planning and Sustainable Development, Trinidad and Tobago*
- Decision Trees and GIS Techniques for Modeling Disease Emergence  
*Nathaniel Royal, PhD, Post-Doc, University of Florida, Gainesville, FL*
- Landscape Epidemiology of Human Anthrax in the Country of Georgia  
*Ian Kracalik, MA, MPH, Research Program Coordinator, University of Florida, Gainesville, FL*

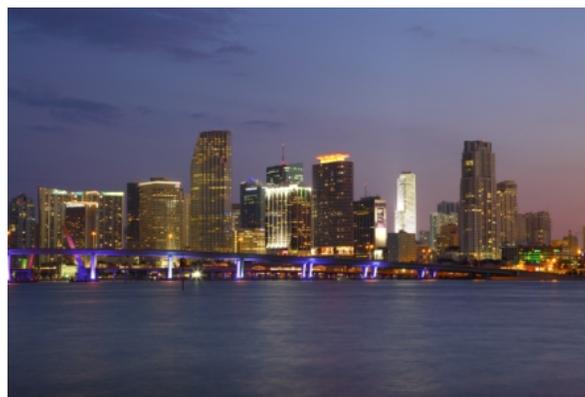
#### Chronic Disease

##### Room: Gardenia

In this session, GIS techniques are applied to the study of chronic diseases at varying geographic scales. Following the presentations, the Session Moderator will lead a structured discussion of the health data and methodological challenges involved in expanding the reach of GIS health applications in this important public health arena.

*Session Moderator: Russell Kirby, University of South Florida*

- Using Geospatial Mapping to Address the Burden of Diabetes in Durham County, NC  
*Nicole Sandberg, MURP, GIS Analyst, Children's Environmental Health Initiative, Ann Arbor, MI*
- Small-Area Geographies of Mental Health in England  
*Nick Bearman, Associate Research Fellow in GIS, European Centre for Environment and Human Health, University of Exeter Medical School, United Kingdom*



#### Conference Social Hour on the Riverwalk

**5:00 PM – 6:30PM** (rain venue... Upper Promenade)

Great views, substantial appetizers, cash bar and excellent company!

Sessions reconvene at 8:30 tomorrow morning.

**Thursday, June 20, 2013**

## **Educational Sessions**

**8:30– 10:00 AM**

### **Environmental Health/Built Environment**

#### **Room: Hibiscus A**

In this session, we will explore environmental health demographics associated with the built environment.

*Session Moderator: Nathaniel Royal, University of Florida*

- GIS for Community Air Quality: A Spatial Model of Diesel Exhaust  
*Jill Schulte, Research Assistant, University of Washington, Seattle, WA*
- Healthcare Waste Management in Nigeria – A GIS Approach  
*Adeniyi Francis Fadaio, GIS Consultant, National Population Commission, Abuja, Nigeria*  
*Kelechi Enweruzo-Amaefule, JSI/AIDSTAR-One Project, Abuja, Nigeria*
- GIS for Ecosystem Health Assessment: A Bayesian Modeling Approach  
*Pushpendra Rana, Graduate Student, Geography and GIS, University of Illinois at Urbana-Champaign, IL*

### **Chronic Disease**

#### **Room: Hibiscus B**

In this session, GIS techniques are applied to the study of chronic diseases at varying geographic scales.

*Session Moderator: Jason K. Blackburn, University of Florida*

- Spatiotemporal Clustering of Colorectal Cancer in Florida, 1981-2010  
*Naresh Kumar, PhD, Associate Professor, University of Miami, Miami, FL*
- Examining Geospatial Clustering of Late-Stage Colorectal Cancer in Florida  
*Recinda Sherman, MPH, CTR, Senior Research Associate, Florida Cancer Data Systems, University of Miami, Miller School of Medicine, Miami, FL*  
*Stacey Tannenbaum, PhD, RD, LD/N, Assistant Scientist, Department of Epidemiology, University of Miami, Miller School of Medicine, Miami, FL*

### **Geographic Information Science, Public Health and Disease Surveillance in Developing Regions**

#### **Room: Gardenia**

National-level disease surveillance requires an infrastructure that is well organized and effective at many levels: administratively, technically and biologically. Geographic information science can play a key integrative role in this process making it possible to assess the rate of diseases and conditions relative to past rates in different geographic areas and to link health conditions to the social and environmental context in which they occur. In this session, speakers describe their experiences with GIS for public health in less developed regions, then the floor will be opened up for audience participation and discussion.

*Session Moderator: Lynette Akong, Trinidad and Tobago Ministry of Planning and Sustainable Development*

- Health Applications of Geographic Information Science in India: A Review  
*Marilyn O'Hara Ruiz, PhD, Clinical Associate Professor, University of Illinois, Urbana, IL*
- Preparing for the Future: Are Caribbean Countries Positioned to Manage the Increase in Non-Communicable Illnesses?  
*Pat Boda, PhD, Assistant Professor, Middle Tennessee State University, Murfreesboro, TN*

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**Step into the registration foyer for a coffee break before reconvening for the closing keynote address!**

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### **Closing Keynote Address**

**10:30 – 11:30 AM**

#### **Room: Hibiscus B**

The conference will close with a discussion of lessons learned and an important keynote address from Andrew Curtis, GIS Health and Hazards Lab, Kent State University.



### **Health, Disasters and Crime: Working Geospatially at the “Scale” of Intervention**

This presentation will focus on two topical areas linked by a field-based spatial technologies and analytical perspective: 1) the disasters and health nexus and 2) gun-related violence in “typical” US cities. These subject areas will be discussed using the “scale of intervention”, meaning data collection, analysis and insight dissemination will occur at a scale relevant for stakeholders focused on intervention. This scale primarily consists of buildings (and the spaces between), streets, corners and block faces, and sub-neighborhood places. The talk will include a section on novel geospatial data collection technologies, especially spatial video that can enrich fine scale spatial analysis where previously either no data existed, was extremely expensive to collect, or existed at too coarse an aggregation to reveal patterns in and around domicile and activity spaces. These new mobile mapping approaches also facilitate longitudinal analysis, which is an imperative for dynamic landscapes.

This talk will primarily draw on five case studies: eight years of Hurricane Katrina research, spatial patterns of recovery after the Joplin Tornado of 2011, challenges in collecting data for a post-earthquake cholera-impacted town in Haiti, using epidemiological approaches to search for patterns in gunshots in Youngstown, Ohio, using mixed methods to develop a holistic neighborhood scale insight into crime – combining police and community geonarratives for one gang-impacted neighborhood of Akron, Ohio.

The talk will conclude with a few words regarding spatial confidentiality, and emerging concerns in the broadly defined area of GIS and Health.

*Andrew Curtis is the Director of the GIS | Health & Hazards Lab and Associate Professor in the Department of Geography at Kent State University. He is also a former Director of the World Health Organization's Collaborating Center for Remote Sensing and GIS for Public Health. His work employs novel geospatial technologies and analytical approaches to support neighborhood scale intervention strategies primarily focused on the reduction of health disparities across different topical areas and geographies. Examples of his health related GIS partnerships include different government departments of public health, especially Los Angeles County Department of Public Health, area hospitals and specialized clinics, non-profit organizations and community / neighborhood associations. With regards to the subject matter of this talk, in 2005 after the landfall of Hurricane Katrina, he and his students were part of the academic team that helped with geospatial support for search and rescue operations in the Louisiana Emergency Operations Center (EOC). His geospatial recovery work continues in New Orleans and has extended to several other disasters, most notably post-tornado Joplin, Mo. He has developed fine scale data collection strategies for*

*different "challenging" environments including cholera-impacted Haiti, and the slums in and around Dhaka, Bangladesh. He has also made several geospatial presentations linking health, hazards and crime at the sub-neighborhood scale to different Department of Justice audiences. He is currently working on projects with the Northern Ohio Violent Crime Consortium, especially Akron and Youngstown Police Departments on topics involving gun and gang violence. Curtis is also a recognized leader in the field of spatial confidentiality, which is an issue in all of the previously mentioned areas of research.*

## Pre-Conference Attendee List (as of June 10, 2013)

Valentyna Abdullina - Black & Veatch - Kyniv, Ukraine  
Lynette Akong - Ministry of Planning and Sustainable Development - Charlieville, Trinidad and Tobago  
Mohammad Al-Hamdan - NASA Marshall Space Flight Center – Huntsville, AL  
Temitope Alimi - University of Miami - Coral Gables, MI  
Carl Anderson - Spatial Focus Inc – Sarasota, FL  
Lilit Avetisyan - State Hygiene and Anti-Epidemic Inspectorate (SHAEI) - Yerevan, Armenia  
Lina Balluz - Centers for Disease Control & Prevention - Chamblee, GA  
Alassane Barro - University of Florida - Gainesville, FL  
Nick Bearman - University of Exeter Medical School - United Kingdom  
Lindsay Bell - Spatial Epidemiology & Ecology Research Lab - Gainesville, FL  
Teresa Bell - University of Tennessee Health Science Center - Memphis, TN  
Gina Besenyi - University of South Carolina Arnold School of Public Health - Columbia, SC  
Maksym Bezymennyi - IVM Ukraine - Kyiv, Ukraine  
Jason Blackburn - Emerging Pathogens Institute, Gainesville, FL  
Antonio Blazevic - Lake Mary, FL  
Patricia Boda - Middle Tennessee State University - Murfreesboro, TN  
Waraporn Boonchieng - Chiang Mai University - Chiang Mai, Thailand  
Brian Bossak - Georgia Southern University - Statesboro, GA  
Jessica Brehmer - Minnesota Department of Health - St. Paul, MN  
Tleubergen Bulembayev - Nazarbayev University - Astana, Kazakhstan  
Taurai Bwerinofa - John Snow Inc - Pretoria, South Africa  
Grettel Castro - Herbert Wertheim College of Medicine - Miami, FL  
William Crosson – NASA - Huntsville, AL  
Andrew Curtis - Kent State University - Kent, OH  
Bernadette de Leon - Indiana University Bloomington - Bloomington, IN  
Lorraine Dean - University of Pennsylvania - Philadelphia, PA  
Eric Delmelle - University of North Carolina at Charlotte - Charlotte, NC  
Tim Dutton - Sarasota Community Studio - Sarasota, FL  
Sue Estes - NASA/USRA - Huntsville, AL  
Carolyn Fahey - American Academy of Family Physicians - Washington, DC  
Nia Foderingham - Concentra Medical Centers - Nashville, TN  
Stephanie Foster - Centers for Disease Control - Atlanta, GA  
Estella Geraghty - University of California, Davis - Rancho Cordova, CA  
Gregory Glass - Southern Research Institute - Baltimore, MD  
Varun Goel - University of Illinois-Urbana, Urbana, IL  
Panduleni Hailonga-van Dijk - University of Namibia - Windhoek, Namibia  
Daikwon Han - Texas A&M University - College Station, TX  
Heather Hardester – Critigen - Gainesville, FL  
Morgan Hess-Holtz – University of South Florida - Tampa, FL  
William Hinson - University of Florida - Gainesville, FL  
Eileen Johnson - Bowdoin College - Brunswick, ME  
Brigita Kardava - Georgian Branch of CH2MHILL International Inc - Tbilisi, Georgia  
Elizabeth Kelly - University of Miami - Miami, FL  
Lela Kerdezevadze - Laboratory of the Ministry of Agriculture - Tbilisi, Georgia  
Russell Kirby - University of South Florida - Tampa, FL  
Maxwell Kligerman - Stanford University - Plantation, FL  
Ian Kracalik - University of Florida - Gainesville, FL  
Naresh Kumar - University of Miami - Miami, FL  
Bo Yeon Kwon - Korea University Graduate School - Seoul, South Korea  
Thomas Larsen - North Denmark Region - Aalborg Oest, Denmark  
Suji Lee - Korea University Graduate School - Seoul, South Korea  
Eric Little - Department of Veterans Affairs - Gainesville, FL  
Yang Liu - Emory University - Atlanta, GA  
Xiaonan Ma - The University of Hong Kong - Hong Kong, China  
Lile Malania - National Center for Disease Control & Public Health - Tbilisi, Georgia  
Mykola Mandyhra – NAAS - Kyiv, Ukraine  
Julieta Manvelyan - National Center for Disease Control & Public Health - Tbilisi, Georgia  
James McCall - Miami-Dade County - Miami, FL

Jacqueline Mills-Curtis - Kent State University - Kent, OH  
Douglas Morales - Los Angeles County Department of Public Health - Los Angeles, CA  
Lillian Morris - Spatial Epidemiology & Ecology Research Lab - Gainesville, FL  
Jocelyn C. Mullins, Spatial Epidemiology & Ecology Research Lab, University of Florida, Gainesville, FL  
Abdulkader Murad - King Abdulaziz University - Jeddah, Saudi Arabia  
Marilyn O'Hara - University of Illinois - Urbana, IL  
Emerson Ong - Oregon Office of Rural Health - Portland, OR  
David Padgett - Tennessee State University - Nashville, TN  
Roengrudee Patanavanich - University of Maryland - Ellicott City, MD  
John Pearce - Emory University - Atlanta, GA  
Jeffrey Percy - CDC/National Center for Health Statistics - Hyattsville, MD  
Camille Perchoux - UdeM/CRCHUM - Montreal, QC, Canada  
Meredith Phillips - Georgia Southern University - Macon, GA  
Allison Pinto - Sarasota Community Studio - Sarasota, FL  
Ram Poudel - The University of Oklahoma Health Sciences Center - Oklahoma City, OK  
Pushpendra Rana - University of Illinois at Urbana Champaign - Urbana, IL  
Jennifer Rankin - Robert Graham Center - Washington, DC  
Seann Regan – Baylor College of Medicine - Houston, TX  
Pura Rodriguez De La Vega - Herbert Wertheim College - Miami, FL  
Oleg Romanenko – SSCIBMS - Kyiv, Ukraine  
Nathaniel Royal - University of Florida - Gainesville, FL  
Daiane Roza - Ribeirao Preto Medical School / University of Sao Paulo - Ribeirao Preto, Brazil  
Abby Rudolph - Pacific Institute for Research & Evaluation - Calverton, MD  
Jill Rushing - North Carolina Division of Public Health - Raleigh, NC  
Veronika Sadovskaya - TMC/AECOM - Almaty, Kazakhstan  
Nicole Sandberg - Children's Environmental Health Initiative - Ann Arbor, MI  
Jill Schulte - University of Washington - Seattle, WA  
Knarik Serobyan - , Dulles, VA  
Sara Simmonds - Kent County Health Department - Grand Rapids, MI  
Valerii Skrypnyk – SSCIBMS - Kyiv, Ukraine  
Monica Slentz - City of Houston Health & Human Services - Houston, TX  
Helena Solo-Gabriele - University of Miami - Miami, FL  
Rebecca Stallings - Missouri State University - Springfield, MO  
Michael Stiehl - Northwestern University - Chicago, IL  
Justin Stoler - University of Miami - Coral Gables, FL  
Mykola Sushko – SSRILDVSE - Kyiv, Ukraine  
Marat Syzdykov - TMC/AECOM - Almaty, Kazakhstan  
Thomas Talbot - State of New York - Albany, NY  
Mariam Uchaneishvili - CH2M Hill International Inc - Tbilisi, Georgia  
Leila Utepova – Nazarbayev University - Astana, Kazakhstan  
Deborah Vollmer Dahlke - Texas Life Science Foundation - Austin, TX  
Nataliia Vydaiko - CSES, Ministry of Health of Ukraine - Kyiv, Ukraine  
Travis Wallace – ORISE - Portsmouth, VA  
Kenny Yeh – MRIGlobal - Rockville, MD  
Sudha Yerramilli - National Center for Biodefense Communications - Edison, NJ  
Gulnara Zhumabayeva - TMC/AECOM - Almaty, Kazakhstan

# URISA's 2013 GIS in Public Health Conference

## June 17-20, 2013 – Miami, Florida

### Poster Session

#### **Using the Map as a Guide: Building GIS Capacity for Chronic Disease in State Health**

*Nicole Sandberg, MURP, GIS Analyst, University of Michigan, Ann Arbor, MI*

Geographic Information Systems (GIS) based techniques have been widely adopted and applied in the fields of infectious disease and environmental epidemiology; their use in chronic disease programs is relatively new. This poster highlights the US Centers for Disease Control and Prevention, Division for Heart Disease and Stroke Prevention collaborative efforts with the National Association of Chronic Disease Directors and the University of Michigan to provide health departments (HDs) with capacity to integrate GIS into daily operations, supporting existing priorities for surveillance and prevention of chronic diseases.

To date four cohorts of HDs (19 state health departments) have participated in this project. Based upon the experience of these four cohorts, we identify key GIS skills that support the ongoing missions of health departments and showcase high impact GIS projects that have been developed and applied by participants in support of chronic disease surveillance. GIS offers diverse sets of tools that promise increased efficacy for chronic disease health department staff.

#### **Biofilms, Microbes, and Beach Water Quality: An Analysis of Florida Counties**

*Elizabeth Kelly, BA, MA, Student, University of Miami, Miami, FL*  
*Helena Solo-Gabriele, BS Civil Engineering, MS Civil Engineering, Associate Dean for Research, Professor of Civil Engineering, University of Miami, Miami, FL*

We analyzed 12 years (2000-2011) of bacterial monitoring data on marine beach water from the Florida Department of Health. This data from the Florida Healthy Beaches program was assessed using spatial mapping (ArcGIS) to illustrate the distribution of the mean value of bacteria levels (enterococci and fecal coliform) and the frequency of the exceedences. We plotted 77 locations on our maps. The top 10 frequencies of exceedences ranged from 5.1% to 16.4%. Of the top 10 exceedences, 5 occurred in Miami-Dade County, 3 in Monroe, and 2 in Palm Beach. Of the lowest 10, 4 occurred in Palm Beach County, 3 in Collier, and 1 each in Dade, Broward, and Monroe. The top 10 included all but one of the bay-facing beaches (although only three of the 77 were bay-facing). The lowest 10 were all beach-facing. Analysis of beach bottom slope revealed that the beach slopes between the top 10 and lowest 10 were not significantly different.

Based on our initial evaluation, beach geographic location appeared to represent the most significant factor, as many of the high exceedences are in Miami-Dade and Monroe Counties, and the lower exceedences are in Palm Beach and Collier Counties. In future studies, we will investigate the microbial communities in the areas that are highlighted in the top ten and lowest ten lists from our map results. We will also conduct a survey of beach management and beach characteristics with the assistance of county beach managers, and will add these results to our maps.

#### **Predict Heat Stress Using RCP Data for Major Cities in South Korea**

*Suji Lee, Master of Public Health, Ph.D Student/Researcher, Korea University Graduate School, Seoul, South Korea*

*Bo Yeon Kwon, Master of Public Health, Ph.D Student/Researcher, Korea University Graduate School, Seoul, South Korea*

**Objectives:** Analysis of heat stress levels of major cities in Korea by using heat index (HI) and discomfort index (DI) based on RCP(representative concentration pathway) 4.5 and 8.5 scenarios.

**Background:** There has been an increasing need to assess the effects of climate change on human health, especially heat stress effects, to make adjustment plans for major cities.

**Method:** The grid-format climate data of South Korea based on RCP scenarios were modified into area-format climate data according to the major cities or provinces of the country, up to the year 2100. The HI and DI were analyzed by plotting the average indices every ten years, and by comparing cities or provinces with index level changes by GIS.

**Results:** Both the HI and DI are expected to continually increase from 2011 to 2100, and to reach the most dangerous level especially in August 2100. Gwangju city showed the highest HI and DI, and Gangwon province is expected to be the least affected area in terms of HI and DI among all the country's provinces.

**Conclusions:** This approach might be useful to diagnosis climate vulnerable areas and to analyze the impacts of public health.

#### **Spatial Analysis of Human Plague Case in Kazakhstan**

*Zaurbek Sagiyev, Head of Cholera Lab, M. Aikimbayev's Kazakh Scientific Center for Quarantine and Zoonotic Diseases, Kazakhstan*  
*Jason K Blackburn, PhD, Assistant Professor, Spatial Epidemiology & Ecology Research Laboratory, Gainesville, FL*

In 1989 a human plague case was registered at PreBalkash natural plague focus of Kazakhstan. The passport data of plague epizooty of the focus from 1988 to 2003 were collected for spatial analysis of the case. The data included information of plague hosts and vectors that were positive for *Y.pestis*. The geographic coordinates of the data were found by ArcGIS. Then all data were mapped and processed by Spatial Statistics Tools. The spatial analysis showed the cluster of the epizooty where the microbes were isolated each year. Also it showed different sizes of plague spillover caused by increasing of the host and vector populations and its migrations, including plague positive animals, to find new places. In 1989 a radius of the spillover was greater than other years.

The analysis showed the person was infected with the plague within the radius of the epizooty. Plague spillover and certain human behavior caused the human plague cases. Use GIS in plague epidemiology can help to monitor the plague foci and prevent population to be infected with plague.

#### **The Associations between Exposures to Traffic and Mortality Risks in Hong Kong**

*Xiaonan Ma, Master Candidate, The University of Hong Kong, China*

**Background:** Traffic is a main source of air pollution in Hong Kong. The associations between traffic related health effects have been

reported mostly for European and North America, but very few for densely populated urban environments in Asia.

**Objective:** To assess traffic related health effects in the population of Hong Kong.

**Methods:** Residential locations of persons who died during 2010 were documented in 209 Tertiary Planning Units (TPU) of Hong Kong. The 2010 Annual Average Daily Traffic (AADT) data were retrieved from traffic census reports. Three indicators of traffic-related exposure by TPU were computed using ArcGIS (version 9.2): (i) Road Density (RD) = total length of roads divided by area; (ii) Traffic Density (TD) = RD times AADT; and (iii) Vehicle Density (VD) = AADT divided by area. They were further categorizing into three levels by tertile: low, middle and high. Poisson regression models of standardized mortality ratios were fitted with adjustment for ethnicity, marital status, education level, housing type and income. Results: The ranges of risk ratios (95% CI) of mortality for high or middle relative to low exposure level were: for all-nature causes 1.17 (1.13-1.21)-1.32(1.27-1.36), cardiovascular 1.16(1.09-1.23)-1.27(1.19-1.37), respiratory 1.30(1.20-1.42)-1.44(1.33-1.56), and cancer 1.08(1.02-1.14)-1.28(1.20-1.36). The risk ratios were the highest for the middle level of TD or VD, but increased from middle to high level of RD.

**Conclusions:** Traffic related exposures measured at the neighborhood levels are associated with mortality. Investigations at individual levels are necessary to account for confounding.

#### **Spatio-Temporal Clustering of Colorectal Cancer Cases in Houston, Texas**

*Monica Slentz, PG, BS, Sr. GIS Analyst, City of Houston Health & Human Services, Houston, TX*

**Background:** Colorectal cancer (CRC) remains one of the top causes of cancer morbidity and mortality in the U.S. Although early detection and diagnosis lead to an increase in the survival rate, minorities and the underserved continue to have the worst outcomes. The objective of this study was to identify patterns of colorectal cancer incidence and late-stage diagnosis in Houston, Texas.

**Methods:** Thirteen years of geocoded CRC data (1995-2007) from the Texas Cancer Registry were attained for 592 census tracts encompassing the city of Houston. Community-dwelling adult cases, residing within the study area at the time of diagnosis, were selected for analysis (N=13,818). Results of previous spatial analyses indicated that many low income African American neighborhoods in Houston are at elevated risk of both excess incidence and late stage diagnosis of CRC. For this study, purely spatial Poisson probability models, adjusted for age and poverty, were created in SaTScan™ software (version 7) to evaluate the effect of area level poverty on previously identified cluster patterns. Spatio-temporal analyses were then performed to determine if clustering was stable over the thirteen year study period.

**Results:** Results indicate that poverty is associated with clustering of late stage CRC diagnosis across much of the study area, with the exception of the location of the primary cluster. Spatio-temporal analyses reveal a shift in the location of primary clusters, of both incidence and late stage diagnosis, from south central to northeast Houston during the study period.

**Discussion and Conclusions:** Further research is warranted to identify factors other than poverty that may be associated with the primary cluster and to examine the possible reasons for shifting of clustering of late-stage CRC diagnosis from one low income predominantly African American neighborhood to another over the

course of the study period.

#### **Bayesian Spatial Analysis of Teenage Pregnancy Rates in a Brazilian State**

*Daiane Leite da Roza, Doctoral Student, Ribeirao Preto Medical School / University of Sao Paulo, Brazil*

Teenage pregnancy is a common public health problem worldwide, given its high prevalence. The objective of this ecological study was to study the spatial pattern of association between the percentage of teen pregnancy in each of the municipalities of the state of Sao Paulo – Southeast Brazil, in 2007, and the socioeconomic characteristics of these municipalities. We used a Bayesian model with a spatial distribution following a conditional autoregressive (CAR) form based on Markov Chain Monte Carlo algorithm. For adjustment of the model, we used the WinBUGS computer program in the GeoBUGS module. Data on teenage pregnancies were obtained from the SINASC Information System and socioeconomic characteristics of the municipalities were obtained from the Brazilian Institute of Geography and Statistics (IBGE).

The model showed that the occurrence of early pregnancies is higher in municipalities with lower Gross Domestic Product (GDP) per capita, a higher incidence of poverty, lower population size, lower human development index (HDI) and a higher percentage of individuals with “Sao Paulo social vulnerability index” equal to 5 or 6 (more vulnerable). Teen pregnancy was less common in large cities, regions characterized by greater supply of health services and income per capita, but where there are still segregation, poverty and social inequality. The study demonstrated a close association between teenage pregnancy and social and economic indicators. The direct interventions on vulnerable groups of adolescents are of great importance for the prevention of early pregnancies.

#### **The Influence of Environmental Factors on the Key West (Florida) DF Outbreak**

*Meredith Phillips, MPH(c), BS, Graduate Assistant, Georgia Southern University, Macon, GA*

*Brian Bossak, PhD, MPH, Division Director of Environmental Health Sciences, Georgia Southern University, Statesboro, GA*

Dengue fever (DF), also known as “breakbone fever”, is the most prevalent vector-borne viral scourge, infecting up to 100 million people per annum globally. It is transmitted through the bite of infected mosquitoes of the *Aedes* genus and there is currently no effective vaccine or pharmaceutical treatment.

This arboviral disease is increasing in incidence and prior research has suggested a proliferation in DF prevalence in association with global warming, although this link remains controversial. Although DF was historically present in the southern United States, locally-acquired DF was absent from south Florida from 1934 until 2009, when an outbreak occurred in Key West, vectored by the resident *Aedes aegypti* mosquito. Eighty-six locally-acquired DF cases were confirmed by the Centers for Disease Control and Prevention (CDC) during the period from July 2009 through November 2010, with two additional cases of DF diagnosed with an unknown date of onset. At the same time, the largest DF outbreak in Puerto Rican history was taking place, resulting in more than 21,000 cases. Climate data was used with descriptive statistics to assess the correlation of the Key West DF outbreak with climate features, including El Niño-Southern Oscillation (ENSO), which was in an El Niño phase during the outbreaks.

The incidence of arboviral diseases is associated with many factors, including environmental and social parameters (such as factors related to exposure); however, results determined that climatic factors were associated with this particular epidemic. Temperature showed the greatest correlation with DF cases.

#### **Coastal Georgia is Not Immune: Hurricane History Analysis, 1750-2012**

*Brian Bossak, PhD, MPH, Division Director of Environmental Health Sciences, Georgia Southern University, Statesboro, GA*  
*Sarah Keihany, MPH, Research Assistant, JPHCOPH, Georgia Southern University, Statesboro, GA*

The coastline of Georgia has experienced infrequent hurricane landfalls in recent decades; however, documentary evidence suggests that Georgia's coast was targeted by hurricanes frequently in earlier historical periods. This is concerning because the lack of recent hurricane landfall experience may be contributing to rampant preparedness complacency among the state's coastal residents.

In order to analyze the risk of hurricane landfall in Georgia, we utilize historical records (diaries, ship logs, newspapers, weather records) and NOAA's North Atlantic Hurricane Database (HURDAT). We also conduct a regional analysis (with South Carolina and Northeast Florida) to compare trends in hurricane landfalls over the time period between 1851 and 2012. We utilize Geographic Information Systems (GIS) to generate and map individual storm tracks of all the hurricanes striking Georgia between 1750 and 1850, as well as including tracks for all HURDAT-based (1851-2012) storms. Cross-validation among historical documentation and ship records was used to minimize track error where possible. The newly generated tracks will be used to map and recalculate updated hurricane return periods for each of Georgia's coastal counties, which may improve and enhance the existing knowledge of severe coastal storms in the state. Moreover, evacuation scheduling, shelter provision and emergency planning in the state's coastal counties are issues of public health preparedness. This project will generate an expanded dataset of tropical cyclone impacts along the Georgia coastline and will alleviate the need for coastal managers, emergency preparedness officials, and coastal researchers to have to consult disparate data sources to gather information on historical hurricanes.

#### **Socio-Spatial Patterning of Alcohol Outlets after a Policy Change** *Daikwon Han, Assistant Professor, Texas A&M University, College Station, TX*

Despite the increasing evidence on the associations between alcohol availability and violence, there is still a need for further geospatial studies in a variety of settings that assess the conditions under which changes in alcohol availability affect alcohol-related behavior and alcohol-related harms. We conducted a study identifying the social and spatial patterning of alcohol outlets after a policy change that ended prohibition of off-sale outlets in Lubbock, Texas.

All active alcohol outlets during the time period between September 2009 and December 2011 were identified and geocoded. Using point pattern analyses, socio-spatial patterning of outlets were examined by permit types (on- and off-sale), by temporal time periods, and by population/place characteristics. Our findings indicated that socio-spatial patterning of alcohol outlets varied by outlet types and by neighborhood characteristics across the study area. There was statistically significant difference in spatial patterning between off-sale and on-sale outlets. Similarly, population

characteristics were somewhat different by types and existence of outlets across the census block groups. These findings may provide evidence of the spatially-patterned alcohol exposures that is important in further understanding the association between alcohol availability and alcohol-related behavior and problems.

#### **Observational and Geospatial Analysis of Distracted Driving on a College Campus**

*Parker Hinson, MPH, Doctoral Student / Public Health Consultant, University of Florida, Gainesville, FL*

**Background:** Distracted driving has become a critical public health focus. Thousands of deaths are observed annually from distraction-related crashes. In 2010, 3,092 people were killed in crashes and an estimated additional 416,000 were injured in motor vehicle crashes involving a distracted driver in the United States. With more than 300 million wireless subscriptions in the U.S. today, technology is playing an ever-increasing role in our quality of life and health. Failure to detect hazards and avoid distractions while driving has clear implications on safety.

**Objective:** To observe and map distracted driving within the University of Florida campus.

**Methods:** Observational data was gathered on the UF campus. Incidence rates and direction of travel were mapped and analyzed to identify intersections and roads where distracted driving events are more likely to occur.

**Results:** Analyses show that among 994 cases, 13% (n=129) were observed driving while distracted. These included incidences of texting, dialing, speaking, eating/drinking, writing, and reading. Consistent with prior research, males were more likely than females to be seen driving distracted (60% vs 40%). GIS analysis identified specific areas on campus with the highest rates of distracted driving.

**Conclusion:** Geospatial identification of distracted driving has important safety implications for drivers, passengers, cyclists and pedestrians on college campuses. This research shows distracted driving occurs at UF, and indicates a need for public awareness, behavioral interventions, and institution-based policy among students, faculty, visitors, and employees. Further research on other college campuses is necessary, as well as the utilization of GIS for behavioral research.

#### **Kazakhstan Health Study : The Study of the Determinants of Metabolic Syndrome in Elderly Population**

*Leila Utepova, MPH, Researcher and Tleubergen Bulembayev, PhD, Senior Researcher, Center for Life Sciences, Nazarbayev University, Astana, Kazakhstan*

**Introduction:** The Center for Life Sciences developed the KHS study as part of a Center's survey program to compile comprehensive information on the health and well-being of adult populations in Kazakhstan. The aim of the project is a comprehensive study of various markers and biomarkers of aging in elderly persons in Kazakhstan.

**Methods:** A cross-sectional study of random population sample in Astana (Kazakhstan) was conducted. Socioeconomic circumstances and health behaviours were available from 500 pilot subjects aged 50-75 years. Data was collected in a form of standardized questionnaires, clinical data and laboratory results. A standardized questionnaire includes an overall assessment of the patient's health, medical history, lifestyle, socio-economic and psychosocial indicators, as well as physical examination and biometric indicators: height, weight, body length, waist and hip circumference, blood pressure, cognitive function, objective measurements of physical

functioning. Also blood samples was collected: Plasma, Serum, Full blood, and Buffy coats (DNA).

**Results:** The associations between socio-economic indicators and health behaviour showed heterogeneity in comparison with other countries. Future studies should consider multiple measures of socio-economic position. Population genetics to be analysed this year (2013). Addressing health inequalities is high on international agenda. Our finding of a pronounced social gradient in physical functioning and health behaviours in the population sample in Astana is crucial for policy makers in public health.

#### **Analyzing Human Cutaneous Anthrax at the Rural/Urban Interface in the Country of Georgia**

*Lile Malania, MD, PhD, and Julieta Manvelyan, National Center for Disease Control, Tbilisi, Georgia*

*Ian Kracalik, MA, MPH, Research Program Coordinator, University of Florida, Gainesville, FL*

*Jason Blackburn, Spatial Epidemiology & Ecology Research Lab, University of Florida, Gainesville, FL*

Anthrax is a zoonotic disease of importance to human and veterinary health. In the country of Georgia recent reports have indicated a worsening disease situation and have reiterated the importance of surveillance and control in endemic regions. The purpose of this study was to examine human anthrax across the urban/rural interface to detect any possible differences in risk. Data on human cutaneous anthrax during the period 2005 to 2009 was obtained from the National Center for Disease Control and Public Health (NCDC&PH). Cases were aggregated to the village level and mapped using the IndexMundi database. Epidemiological information on the age, gender, and source of infection were recorded for each case. Villages reporting at least one case of human anthrax were classified as either urban or rural according to the Global Rural-Urban Mapping Project (GRUMP). A cumulative incidence ratio (CIR) was calculated to compare the risk in rural and urban areas. Chi square analysis was used to compare epidemiological characteristics between urban and rural areas. There were a total of 111 rural cases and 79 urban cases. Risk during this period was higher in urban areas CIR = 1.5 (95% CI: 1.17, 2.08). Differences in epidemiological characteristics were found between the two areas. The findings here suggest that although anthrax is considered a disease of rural areas, spillover of the disease at the rural/urban interface represents a growing concern for human transmission of the anthrax.

#### **Does Place Make a Difference for Texas' Adolescent and Young Adult Cancer Survival?**

*Deborah Vollmer Dahlke, MPAff, Director, Texas Life Science Foundation, Austin, TX*

**Background:** Over the past 20 years, advances in cancer treatment have improved survival rates for children and older adults. However, among adolescent and young adult (AYA) cancer survivors diagnosed between 15 and 39 years of age, there is little to no survival improvement. AYA survivors have greater risks for additional cancers and many AYAs suffer late effects of treatment including cardiotoxicity and fertility issues. AYA survivors frequently experience lower socio-economic status due to delayed education, cost of cancer care, and long-term effects on employment. Prior GIS mapping of Texas AYA incidence and mortality rates by county and by border vs. non border regions suggest that travel distance from American College of Surgeons accredited cancer clinics may affect mortality.

**Objectives:** This study is developing county-level Mortality to Incidence Ratios (MIR) for AYAs in Texas, including cancer-site specific, gender and race/ethnicity specific ratios. The cancer site specific MIR will be used as a proxy for AYA cancer survival in this study.

**Methods:** Data for the research includes 1995-2008 Texas Cancer Registry data for incidence and mortality for AYAs ages 15-39 for 1995-2008 and cancer clinics and oncologists in Texas. Multiple regression models using STATA will be used to analyze relationships between MIRs, age, race/ethnicity, cancer type, socioeconomic status and travel distance. Analyses will include rates of incidence and mortality for all cancer types by county comparing distance to cancer care. Analyses will include MIRs for breast, cervical and lymphoid leukemias by race/ethnicity and border vs. non-border regions.

#### **Travel Time to Primary Care Providers and Non-Urgent EMS Use**

*Teresa Bell, BS, Graduate Student, The University of Tennessee Health Science Center, Memphis, TN*

**Background:** Studies have demonstrated that significant geographic variation in access to medical care exists in urban areas, with providers being concentrated in more affluent areas. Additionally, patients in low-income neighborhoods are more likely to rely on public transit to meet their transportation needs. When taking into consideration travel time by public transit, as opposed to only distance, there is a large amount of variability in the ease of visiting an office-based physician across a community. Because of the increased time it takes to get to a provider, patients may resort to utilizing emergency medical services in order to receive treatment for ambulatory care-sensitive conditions. This study aims to investigate the relationship between patient travel time and non-emergency EMS calls.

**Methods:** We modeled zip codes' rate of non-emergency EMS calls as a function of average travel time by public transit to primary care provider, vehicle ownership, and sociodemographic characteristics using a general linear model.

**Results:** We found that travel time by public transit was not a significant predictor of non-emergency calls. However, zip codes with a higher percentage of households without vehicles were significantly more likely to have a higher rate of non-emergency EMS calls.

**Conclusions:** Our findings suggest that neighborhoods whose residents lack independent means of transportation are more likely to use EMS services for non-emergency medical reasons. Increased understanding of transportation barriers to accessing health services could help explain current utilization patterns, provide more convenient transportation and medical services for citizens, and conserve city government funds.

#### **A Geospatial Analysis of Indoor Radon Data in Relation to Schools in the Atlanta Metropolitan Area**

*Stephanie Foster, MPH, MA, Centers for Disease Control, Atlanta, GA*

Children are especially susceptible to environmental exposures. In proportion to body size, children breathe more air, drink more water, and consume more food than adults. Therefore, exposures occurring during these developmental years may have greater impacts on long term health. Children are also unique because they are required to spend a significant portion of their day at school. We expect our schools to protect our children and provide healthy indoor and outdoor environments; however, one potential exposure that does not receive equal attention across the US is radon gas. Long term exposure to elevated radon can lead to harmful health

effects. Specifically, radon exposure is associated with increased risk for lung cancer. Since radon is odorless, colorless, and tasteless, the only means of detecting its presence is through testing. Unfortunately, only nine states currently require testing for radon in schools. This poster summarizes preliminary work for a broader investigation of potential radon exposure in schools nationwide.

Here, we focus on four counties of metropolitan Atlanta that are classified by EPA as having the highest potential for radon exposure. We used GIS and geospatial analysis to identify locations with indoor radon test results above EPA's action level, to determine the relationship between these areas and nearby public schools, and to estimate the extent of potentially exposed children. We anticipate the results of this work will encourage further radon testing and remediation in schools with the greatest potential risk.

### **The Healthcare Infrastructure of Leogane, Haiti: A Pre and Post-Earthquake Analysis Using Geographic Information Systems**

*Maxwell Kligerman, Stanford University School of Medicine, Palo Alto, CA*

Using GIS data collected on three separate trips to Haiti, this project analyzes how the delivery of healthcare services in the city of Leogane has been impacted as a result of the January 12, 2010 earthquake. Six months prior to the earthquake we collected detailed GIS data regarding the delivery of healthcare services in Leogane. We returned to Leogane six months post and again one year post-earthquake to collect additional GIS data. This project analyzes and maps the spatial impact of the earthquake on healthcare services and determines whether foreign aid efforts have been effective in rebuilding and improving delivery of healthcare services. We conclude that healthcare services in Leogane improved one year after the earthquake, as the number of clinics increased from 34 to 35, operating rooms increased from 1 to 4, and inpatient beds increased from 242 to 294. The report also finds that even though 40% of healthcare facilities collapsed in the earthquake, 70% of these had reopened again one-year post earthquake. The project also identifies three key areas of need with dense populations but limited access to healthcare services.

### **Use of Spatial Profiles to Characterize Multi-Pollutant Exposure Areas in an Urban Environment**

*John Pearce, Postdoctoral Fellow, Rollins School of Public Health, Emory University, Atlanta, GA*

**Background and Aims:** Ambient air pollutant concentrations exhibit intraurban spatial variation due to local emissions sources and differing meteorological influences. The aim of this research is to identify spatial variation of multi-pollutant air quality across an urban environment using spatial profiles.

**Methods:** Spatial fields for annual average concentrations for multiple air pollutants have been predicted across Atlanta, GA, for the year 2010 using CMAQ. In order to characterize the multivariate spatial distribution of this data, a self-organizing map (SOM) has been applied to identify spatial profiles that categorize geographic areas based on similar variation of multi-pollutant combinations. Pollutants included in this analysis are 1-hr maximum carbon monoxide (CO), nitrogen dioxide (NO<sub>2</sub>), nitrous oxide (NO) and sulfur dioxide (SO<sub>2</sub>), 8-hr maximum ozone (O<sub>3</sub>), 24-hr PM<sub>10</sub> and PM<sub>2.5</sub>, and five 24-hr PM<sub>2.5</sub> constituents: elemental carbon (EC), organic carbon (OC), ammonium (NH<sub>4</sub>), nitrate (NO<sub>3</sub>), and sulfate (SO<sub>4</sub>).

**Results:** SOM profiles identify that a variety of multi-pollutant combinations occur across Atlanta, ranging from areas with relatively high concentrations for multiple pollutants (e.g., SO<sub>2</sub>, NO<sub>2</sub>, or O<sub>3</sub>, NO<sub>3</sub>) to relatively high concentrations for a single pollutant (e.g., O<sub>3</sub>), to areas with relatively low concentrations for all pollutants.

**Conclusion:** Our analysis provides a useful description of the spatial nature of multi-pollutant air quality within an urban environment that may be useful in subsequent epidemiological analysis.

### **Robustly Forecasting Spatiotemporal Malarial Regressors in Uganda**

*Semiha Ahmedova, University of South Florida, College of Public Health, Tampa, FL*

Standard methods for multivariate regression analyses of time-series district-level malarial transmission-oriented risk attributes postulate models relating seasonal field-sampled covariate to endemic regions without accurately quantifying autoregressive residual error variance. This uncertainty can lead to mis-specified seasonal forecasts of endemic transmission zones (e.g., hyperendemic, mesoendemic) in district-level malarial risk maps.

In this research we constructed multiple linear and non-linear predictive autoregressive diagnostic error models in SAS/GIS<sup>®</sup> and ArcGIS<sup>®</sup> using multiple georeferenced district-level malaria-related explanatory covariate coefficients seasonally-sampled from 2006 to 2010 in Uganda to quantify predictive error variance in residual forecasts targeting district-level endemic regions. Initially, a Poisson and a negative binomial (i.e., a Poisson random variable with a gamma distributed mean) was constructed in PROC REG which revealed that the residuals and their marginal probabilities derived from the regression model were significant, but furnished virtually no predictive power. Inclusion of indicator variables denoting the time sequence and the district locational geospatial structure was then articulated with Thiessen polygons in ArcGIS<sup>®</sup> and an eigenfunction decomposition spatial filter algorithm in SAS/GIS<sup>®</sup> which also failed to reveal unbiased predictors.

Thereafter, an Autoregressive Integrated Moving Average (ARIMA) Time Series model was constructed in SAS/GIS<sup>®</sup> which rendered a conspicuous but not very prominent first-order residual temporal structure in the seasonal-sampled district-level georeferenced empirical dataset. A random effects term was then specified using the sampled covariate coefficients. This specification included a district-specific intercept term that was a random deviation from the overall intercept term which was based on a draw from a normal frequency distribution. This random effects term displayed no latent spatial autocorrelation and failed to conform to a bell-shaped curve. The model's forecasted residual error variance, however, implied a substantial variability in the seasonal prevalence rates of malaria across the districts. Thereafter, a digital elevation model (DEM) was constructed in ArcGIS<sup>®</sup> which spatially adjusted the seasonal error estimators derived from the ARIMA model in geographical space.

The final risk model was then tabulated as:  $\mu = \exp[a + \text{re} + \text{LN}(\text{population})]$ ,  $Y \sim \text{Poisson}(\mu + \text{DEM (zonal statistic)})$ . The mixed-model estimation results included:  $a = -3.1876$  re  $\sim n(0, s^2)$  mean re  $= -0.0010$   $s^2 = 0.2513$  where  $P(S-W) = 0.0005$  and the Pseudo-R<sup>2</sup> = 0.3103. A random effect intercept and a DEM can spatially quantify erroneous residual predicted residual error variance estimates derived from ArcGIS<sup>®</sup> and SAS/GIS<sup>®</sup> for autoregressively forecasting

malarial-related endemic transmission zones based on seasonal-sampled explanatory covariate coefficients.

**Application of the Geographic Information Systems for the Tularemia Natural Foci Study in Armenia**

*L. Avetisyan, State Hygiene & Anti-Epidemic Inspectorate (SHAEI), Yerevan, Armenia*

**Spatial Analysis of the Brucellosis Distribution in Southern-East Kazakhstan using GIS Technologies**

*M.S. Syzdykov, Kazakh Scientific Center of Quarantine and Zoonotic Disease, Kazakhstan*

*Jason Blackburn, Spatial Epidemiology & Ecology Research Lab, University of Florida, Gainesville, FL*

**Improvement of Epidemiological Surveillance on Plague in Kazakhstan Based on Landscape-Epizootic Zoning and GIS Technologies**

*M. S. Syzdykov and V.P. Sadovskaya, Kazakh Scientific Center of Quarantine and Zoonotic Diseases, Kazakhstan*

*Jason Blackburn, Spatial Epidemiology & Ecology Research Lab, University of Florida, Gainesville, FL*

**On Necessity of Applying GIS for the Tularemia Natural Foci Study in Armenia**

*L. Avetisyan, State Hygiene & Anti-Epidemic Inspectorate (SHAEI), Yerevan, Armenia*

**Mapping of Anthrax Outbreaks in Animals in Ukraine over the Last 90 Years**

*Maksym Bezymennyi, Institute for Veterinary Medicine, Academy of Agrarian Sciences, Kyiv, Ukraine*

*Valeriy Skrypnyk, Institute for Veterinary Medicine, Academy of Agrarian Sciences, Kyiv, Ukraine*

*Oleg Romanenko, Institute for Veterinary Medicine, Academy of Agrarian Sciences, Kyiv, Ukraine*

*Jason Blackburn, Spatial Epidemiology & Ecology Research Lab, University of Florida, Gainesville, FL*

**Hope to see you in September!**



**GIS-Pro 2013: *URISA's 51<sup>st</sup> Annual Conference for GIS Professionals***  
**September 16-19, 2013**  
**Providence, Rhode Island**  
**[www.urisa.org](http://www.urisa.org)**

## URISA's 2013 GIS in Public Health Conference

Hyatt Regency Miami - June 17-20, 2013

### Monday, June 17, 2013

<b>Pre- Conference Workshops &amp; Courses</b>	8:30 AM – 5:00 PM Overview of Open Source GIS Software – URISA Certified Room: Hibiscus A	8:30 AM – 12:00 Noon Detecting Clusters of Adverse Health Outcomes using SaTScan™ Room: Hibiscus B
		1:00 – 5:00 PM Geospatial Data Collection for Micro-Environments and Multiple Time Periods: The Use of Spatial Video Room: Hibiscus B

### Tuesday, June 18, 2013

9:00 – 10:00 AM	Welcome & Keynote Address - Estella "Este" M. Geraghty, MD, MS, MPH/CPH, FACP, GISP "Big Data and Public Health" Room: Jasmine		
10:00 – 10:30 AM	Coffee Break		
10:30 AM – 12:00 Noon	Health Services – Location Room: Hibiscus A	Disease Ecology – Vector Room: Hibiscus B	Remote Sensing Room: Gardenia
12:00 Noon – 1:30 PM	Conference Luncheon – Room: Jasmine		
1:30 – 3:00 PM	Health Services Room: Hibiscus A	Disaster GIS Roundtable Room: Hibiscus B	Remote Sensing – Environmental Pathogen Reservoirs Room: Gardenia
3:00 – 3:30 PM	Coffee Break		
3:30 – 5:00 PM	Neighborhood Effects on Food & Water Security Room: Hibiscus A	Disease Ecology Room: Hibiscus B	Web GIS Room: Gardenia
5:00 – 6:00 PM	Networking Reception and Poster Session in Promenade		

### Wednesday, June 19, 2013

8:30 – 10:00 AM	Travel Time & Health Care Access Room: Hibiscus A	Disease Ecology – Animal Diseases Room: Hibiscus B	Mobile GIS Room: Gardenia
10:00 – 10:30 AM	Coffee Break		
10:30 AM – 12:00 Noon	Socio-Demography and Health Room: Hibiscus A	Environmental Exposures Room: Hibiscus B	Uses of GIS to Improve Community Health Room: Gardenia
12:00 – 1:30 PM	Lunch on your own		
1:30 – 3:00 PM	Poster Session and Refreshments		
3:00–4:30 PM	Toxic Waste/Environmental Exposure Room: Hibiscus A	Infectious Disease Room: Hibiscus B	Chronic Disease Room: Gardenia
5:00 - 6:30 PM	Conference Social Event on the Riverwalk		

### Thursday, June 20, 2013

8:30 – 10:00 AM	Environmental Health/Built Environment Room: Hibiscus A	Chronic Disease Room: Hibiscus B	Geographic Information Science, Public Health and Disease Surveillance in Developing Regions Room: Gardenia
10:00 – 10:30 AM	Coffee Break		
10:30 – 11:30 AM	Closing Plenary Session – <i>Health, Disasters and Crime: Working Geospatially at the "Scale" of Intervention</i> Andrew Curtis, Director, GIS   Health & Hazards Lab, Kent State University Room: Hibiscus B		