

PUBLIC HEALTH GIS NEWS AND INFORMATION

May 2004 (No. 58)

*Dedicated to CDC Scientific Excellence and Advancement in
Disease, Injury and Disability Control and Prevention, and Occupational Safety, using GIS*

Selected Contents: Events Calendar (pp.1-2); (pp.5-6); Public Health and GIS Literature 17); Website(s) of Interest (pp. 17-18); Final



News from GIS Users (pp.2-5); GIS Outreach (pp.6-13); DHHS and Federal Update (pp.13-17); Thoughts (pp.18-21); **MAP** Appendix (22-25)

I. Public Health GIS (and related) Events: SPECIAL NCHS/CDC GIS LECTURES

Please join us! June 15, 2004 Lecture. "Kernel Density Estimation: A New Approach to Measuring Spatial Accessibility of Physicians in Urban Areas", Mark F. Guagliardo, PhD^a, Cynthia R. Ronzio, PhD^a, Ivan Cheung, PhD^b, and Elizabeth Chacko, PhD^b. [^aChildren's National Medical Center and The George Washington University Medical Center; ^bDepartment of Geography, The George Washington University]. See **abstract** this edition. Please join us at NCHS, RM1406, from **2:00-3:15PM**, Hyattsville, MD; The NCHS GIS Guest Lecture Series has been presented continuously since 1988. Envision will be available to offsite CDC locations; Web access will be available on the Internet but only at the time of this presentation. Please contact Editor if you wish to view on the Web. Cosponsors to the NCHS Cartography and GIS Guest Lecture Series include CDC's Behavioral and Social Science Working Group (BSSWG) and Statistical Advisory Group (SAG). [NCHS Cartography and GIS lectures are open to all. Contact: Editor, *Public Health GIS News and Information* at cmc2@cdc.gov]

[Note: Calendar events are posted as received; for a more complete listing see NCHS GIS website and calendar]

* 22nd National ASTDHPPE/CDC Conference on Health Education and Health Promotion, "The Future of Health Promotion and Health Education: Transforming Vision In to Reality," May 5-7, 2004, Orlando FL [See: <http://www.dhpe.org/nationalconference>]

* U.S. Environmental Protection Agency's Environmental Technology Verification (ETV) Program: Stakeholders Briefing, May 11-12, 2004, Arlington VA [See: <http://www.epa.gov/etv>]

* 2004 CDC Diabetes Translation Conference: "Diabetes Prevention and Control: Together We Can Improve Lives," May 11-14, 2004, Chicago IL [See website: <http://www.cdc.gov/diabetes/conferences/index.htm>]

* 2nd Public Health Information Network (PHIN) Stakeholder's Conference, "Connecting for the Public's Health," CDC, May 24-27, 2004, Atlanta, GA [Contact: phin2004@cdc.gov]

* 3rd National Sexual Violence Prevention Conference, "Building Leadership and Commitment to End Sexual Violence," CDC's National Center for Injury Prevention and Control, May 26-28, 2004 Los Angeles CA [See site: <http://www.cdc.gov/ncipc/2004nsvpc.htm>]

* II International Congress of Dengue and Yellow Fever, May 31-June 3, 2004, Havana Cuba [See website at: http://www.cidfa2004.sld.cu/index_ig.php?lang=en]

* US EPA Science Forum 2004: Healthy Communities and Ecosystems, June 1-3, 2004, Washington D.C. [See: <http://www.epa.gov/ord/scienceforum>]

* Penn GIS Symposium on Public Health, University of Pennsylvania, June 21-23, 2004, Philadelphia PA [See: <http://www.sas.upenn.edu/CGS/events/GIS/symposium.php>]

* GISVET 2004: 2nd International Veterinary GIS Conference, June 21-25, 2004, Guelph, Ontario, Canada [See: <http://www.gisvet.org>]

* 36th Symposium on the Interface: "Computational Biology and Bioinformatics," May 26-29, 2004, Baltimore MD [See symposium website at following: <http://www.galaxy.gmu.edu/Interface04/index.html>]

* 29th Annual National Wellness Conference: Creating Optimal Wellness Environments, July 10-15, Stevens Point, WI [See: <http://www.nationalwellness.org>]

* NACCHO Annual 2004 Conference, "Shaping Our Potential: Competencies, Capacities, and Core Functions in Local Public Health," July 14-16, 2004, St. Paul MN

PUBLIC HEALTH GIS NEWS AND INFORMATION

May 2004 (No. 57)

2

[See: <http://www.naccho.org>]

* Race/Ethnicity and Place Conference, by Binghamton University, Howard University, and the Association of American Geographers (AAG), September 16-18, 2004, Washington D.C. [Contact: psolis@aag.org]

* 27th Annual Applied Geography Conference, October 20-24, 2004, St. Louis MO [See conference website at: <http://www.appliedgeog.org/html/main.htm>]

* Urban and Regional Information Systems Association (URISA) 42nd Annual Conference, Nov 7-10, 2004, Reno NE [See: <http://www.urisa.org>]

* Tenth Annual Maternal and Child Health Epidemiology Conference, CDC, December 8-10, 2004, Atlanta GA [See: <http://www.cdc.gov/reproductivehealth/index.htm>]

II. GIS News

[Public Health GIS Users are encouraged to communicate directly with colleagues referenced below on any items; note that the use of trade names and commercial sources that may appear in Public Health *GIS News and Information* is for identification only and does not imply endorsement by CDC]

A. General News and Training Opportunities

1. **Epi Info: A Course for Developers of Public Health Information Systems.** CDC and Emory University's Rollins School of Public Health will cosponsor a course, "Developing Public Health Software Applications Using Epi Info," May 11-13, 2004, at Emory University in Atlanta, Georgia. The course is designed for public health practitioners of epidemiology, with intermediate to advanced skills in computing, who wish to develop software applications by using Epi Info for Windows 98, NT, 2000, and XP.

The 3-day course covers hands-on experience with operating the new Windows version of Epi Info, programming Epi Info software at the intermediate level, and using computerized interactive exercises for developing public health information systems. Tuition charges apply. Deadline for applications is May 1 or until filled. [Additional information and applications are available from Emory University, Rollins School of Public Health, International Health Department, at pvaleri@sph.emory.edu]

2. **Doug Richardson**, Association of American Geographers: Former Senator Bob Kerrey will speak at

the **Mapping the News** conference, May 14-15, 2004, at the National Press Club in Washington, DC. Former Senator Kerrey is now President of New School University in New York City and a member of the National Commission on Terrorist Attacks upon the United States (also known as the 9-11 Commission). The conference explores how maps integrate with journalism and how they help the media to tell the story and the public to better understand the news. It will feature panels on elections mapping, investigative journalism and GIS, crime mapping in the news, and sources of information for journalists and media cartographers. Speakers from major media organizations such as The New York Times, The Washington Post, the Associated Press, CBS News, the National Geographic Society, and others, will discuss mapping as a narrative device at their publications. The conference also features hands-on workshops in news mapping, a luncheon at the National Press Club, and a Friday evening reception at the National Geographic Society Explorers Hall. [For more information, please visit www.aag.org/mapnews or contact Heather Heimbuch at hheimbuch@aag.org]

3. **Lee Smith**, University of Pennsylvania: The Cartographic Modeling Lab (CML) and the College of General Studies of the University of Pennsylvania are proud to present the inaugural **Penn GIS Symposium on Public Health**, June 21-23, 2004, an intensive three-day workshop for administrators and researchers on the use of geographic information systems (GIS). This unique course is designed as a practical introduction to the use of computer mapping and spatial analysis, policy analysis, and informed decision-making. Topics include: Health and the Environment; Public Health Ecology and GIS; Firearm Injury and Alcohol Outlets; Representing the Environment with Administrative Data; Representing the Environment with Raster Data; Working with Raster Data Using Spatial Analyst; Spatial Data Analysis Methods; Hot Spot Analysis and Spatial Regression with Matlab; and, Malaria Risk Profiles in the Brazilian Amazon. [See Penn GIS Symposium on Public health site: <http://www.sas.upenn.edu/CGS/events/GIS/symposium.php> or contact Lee at mlsmith@sas.upenn.edu]

4. **Joe Ryan**, Police Foundation: This is to announce the release of the **"Advanced Problem Analysis, Crime Analysis, and Crime Mapping Training"** curriculum funded by the US Department of Justice's Office of

PUBLIC HEALTH GIS NEWS AND INFORMATION

May 2004 (No. 57)

3

Community Oriented Policing Services. The course is designed for a person with experience in problem solving, problem analysis, crime analysis, and crime mapping to use to instruct practitioners and students in these areas. [Contact to obtain a copy of the training on CD: Joe, Director, Crime Mapping & Problem Analysis Laboratory, at jryan@policefoundation.org]

5. **Editor:** I couldn't resist sharing this memorable event at Towson University's 17th Annual GIS Conference when Dr. John Morgan (left) presented me (totally surprised, but proud) with Towson's "Outstanding GIS



Award", March 23, 2004. It had special meaning for me... as a 1963 alumnus.

6. **Don Taylor**, California Children and Families Commission: **Update to First 5 California Geographic Information System**. For those of you have been interested in the First 5 California Geographic Information System (GIS), it has just been updated with refreshed data and some new layers. Among the new layers available are: Airports; American Indian Areas; Bus terminals; Hospitals; State Assembly District Boundaries; State Preschool sites; State Senate District Boundaries; Train terminals; and, US Congressional District Boundaries. It can be accessed through the main menu (<http://www.cfcf.ca.gov>, the Research, Evaluation and GIS services button, then the GIS services map icon) or directly at <http://63.192.169.198/index.asp>. [Contact: Don, Epidemiologist, at dtaylor@cfcf.ca.gov]

7. Fazlay Faruque, University of Mississippi Medical Center. A symposium on "**GIS and Remote Sensing in Health Sciences**", organized by the University of

Mississippi Medical Center (UMMC), was presented as part of the annual Mississippi Academy of Sciences (MAS) meetings, February 20, 2004, in Biloxi. Speakers included Bill Davenhall, ESRI; Frances Mather, Tulane University; Robert Venezia, NASA; Tim Orsi, NOAA's National Coastal Data Development Center; and William Henriques, CDC's ATSDR. [Contact: Fazley, Director of GIS, at FFaruque@son.umsmed.edu]

B. Department of Health and Human Services

(<http://www.hhs.gov>)

Health Disparities Summit. Secretary Thompson called on health professionals to help overcome racial health disparities among all Americans during remarks before the National Minority Health Foundation. "We are working to break down barriers that prevent people from buying health insurance and to help the uninsured-this is a major hurdle to reducing racial disparities." [See: <http://www.hhs.gov/news/newsletter/weekly/index.htm>]

Administration for Children and Families

<http://www.acf.dhhs.gov>

8. An estimated 896,000 children across the country were victims of abuse or neglect in 2002, according to national data released today by the U.S. Department of Health and Human Services. The statistics indicate about **12.3 out of every 1,000 children were victims of abuse or neglect**, a rate slightly below the previous year's victimization rate of 12.4 out of 1,000 children. The statistics, released April 1, 2004, at the start of Child Abuse Prevention Month, are based on information collected through the National Child Abuse and Neglect Data System.

Agency for Healthcare Research and Quality

<http://www.ahrq.gov>

9. The Agency for Healthcare Research and Quality (AHRQ) cordially invites you to its third annual patient safety research conference, **Making the Health Care System Safer**. The conference will be held September 26-28, 2004 and will offer over 30 patient safety breakout sessions.

Centers for Disease Control and Prevention

[Includes the Agency for Toxic Substances and Disease Registry (ATSDR), in CDC's National Center for Environmental Health]

<http://www.cdc.gov>

10. National Center for Injury Prevention and Control: **Road traffic injuries** pose a global public health crisis.

Worldwide, 1.2 million people die each year from road traffic-related injuries. Millions more are injured, many of whom are permanently disabled. In the United States alone, 40,000 people are killed in road traffic crashes and another 4.5 million are injured each year. Road traffic injuries are the leading cause of death for Americans between 4 and 33 years of age. [See website at www.cdc.gov/ncipc/whd2004/default.htm or learn more about global efforts to make roadways safer by visiting the World Health Organization at www.who.int/world-health-day/2004/en]

11. National Center for Injury Prevention and Control: **Bibliography of Behavioral Science Research in Unintentional Injury Prevention** is now available and includes more than 900 citations of journal articles, book chapters, government reports, and other publications. Designed as a tool for researchers, practitioners and students, this bibliography documents the contributions of behavioral and social sciences to unintentional injury prevention and control from 1980-2003. [See: <http://www.cdc.gov/ncipc/pub-res/behavioral>]

Centers for Medicare and Medicaid Services

<http://cms.hhs.gov>

12. The Centers for Medicare & Medicaid Services today issued instructions that will make it easier for Medicare beneficiaries in **rural areas** to receive inpatient rehabilitation and psychiatric services in facilities near their homes. The instructions, which implement Section 405(g) of the Medicare Prescription Drug, Improvement, and Modernization Act of 2003, allow critical access hospitals (CAHs) to set aside units of up to ten beds each to be used exclusively for inpatient rehabilitation and psychiatric services.

Food and Drug Administration

<http://www.fda.gov>

13. The Center for Veterinary Medicine (CVM) is working with other federal agencies to help the country prepare for a biological emergency, natural disaster or terrorist attack by making sure there is a safe and adequate supply of animal drug products and a safe animal feed supply system.

Health Resources and Services Administration

<http://www.hrsa.gov>

14. The **HRSA Geospatial Data Warehouse** is now

available. The Map Tool allows the visualization of the information in the HRSA Geospatial Data Warehouse against a backdrop of a sampling of demographic data from the 2000 Census along with HRSA-specific geographic designations such as Primary Care Service Areas (PCSAs), Health Professional Shortage Areas (HPSAs), and Medically Underserved Areas/Populations (MUA/P). In addition, cities, highways, and rivers and streams can be added to the maps. The smallest geographic units are Primary Care Service Areas-constructed using Census 2000 ZIP Code Tabulation Areas (ZCTAs).

Indian Health Service

<http://www.ihs.gov>

15. The Direct Service Tribes Meeting Planning Committee invites you to attend the first annual **IHS-Direct Service Tribes National Meeting**, June 1-4, 2004. The theme for this inaugural conference, "As Long as the Grass Grows and the Rivers Flow," makes a powerful statement as Tribal leaders from across Indian Country convene to discuss the unique needs of Tribes that receive health services directly from the Indian Health Service.

National Institutes of Health

<http://www.nih.gov>

16. "**Population, Land Use, and the Environment**," by Barbara Entwisle, NIH behavioral and social science research (BSSR) Director's Wednesday Afternoon Lecture Series (WALS), May 19th, 3:00-4:00 PM, Masur Auditorium, Building 10, Bethesda MD. Other lectures in this series are available at the website. [Contact: Ron, Special Assistant to the Director, at abeles@nih.gov or visit <http://obsr.od.nih.gov>]

Substance Abuse and Mental Health Services Administration

<http://www.samhsa.gov>

17. The Treatment Episode Data Set (TEDS) includes records for some **1.5 million substance abuse treatment admissions annually**. The data reported represent the latest full calendar year data available for each State from the TEDS system. Total numbers and percent distribution are reported by sex, age, and race/ethnicity for each of 15 categories of primary substance of abuse.

C. Historical Black Colleges and Universities (HBCUs) and Other Minority Health Activities

[A listing of HBCUs may be found at the website:
<http://www.smart.net/~pope/hbcu/hbculist.htm>]

18. **HIV Prevention Grants.** Regional and national organizations dedicated to preventing HIV in communities of color will receive \$21 million from the Centers for Disease Control and Prevention. The awards go to 27 different organizations targeting prevention activities for African-American, American Indian/Alaska Native, Asian and Pacific Islander and Hispanic/Latino communities at high-risk for HIV infection.

"Minority communities are disproportionately affected by the HIV/AIDS epidemic," said Secretary of Health and Human Services Tommy G. Thompson. "Partnerships with these communities are critical if we are to get testing and treatment to the people at risk and ultimately reduce the number of new infections." [See: <http://www.cdc.gov/od/oc/media/pressrel/r040407.htm>]

19. **TB rates** declined in the United States in 2003, but significant geographic, racial and ethnic disparities remain, and cases have increased in some parts of the country. California, New York, and Texas accounted for more than 40 percent of the 2003 national case total. TB rates among foreign-born individuals remain disproportionately high, nearly nine times the rate of persons born in the United States. Persons born outside the United States accounted for more than half (53.3 percent) of all new TB cases in 2003. Overall, the national TB rate was 5.1 cases per 100,000 persons in 2003, a slight decline of 1.9 percent in case rate since 2002. Blacks remain at heightened risk for TB. National rates for non-Hispanic blacks are nearly eight times higher than rates for non-Hispanic whites and two times higher than rates for Hispanics. CDC continues to work with partners to identify contributing factors and to develop strategies to eliminate existing disparities among racial and ethnic minorities, including demonstration projects to eliminate TB in African-American communities in the United States. [Source: HHS Weekly Report, March 28-April 3, 2004]

20. **4th Annual National Native Conference on Tobacco, Preserving and Sustaining Our Strengths!** May 23-26, 2004, San Diego, CA. The National Native Conference on Tobacco Use aims to cultivate the sacred use of tobacco and raise awareness of the harms of

commercial tobacco products. Conference Objectives: Increase awareness of traditional uses of tobacco among Native people; Provide prevention information about the use of commercial tobacco products among Native people; Provide opportunities to network with other professional and community people involved in tobacco prevention and education; Educate Native youth about issues revolving around tobacco; and Provide information on current policy, media, and cessation efforts within Indian country [See conference website: <http://www.tobaccoprevention.net>]

D. Other Related Agency or Business GIS News

21. TerraSeer®, Ann Arbor, MI announces the release of its new **Space-Time Intelligence System™ (STIS™)** software. This new tool will help researchers, analysts, and business managers view, interact with, and understand their geographic and temporal data so that they can make timely and informed decisions. TerraSeer's STIS provides seamless interactive mapping, graphing, and animations for intuitive exploratory data analysis. Users can preview a subset of the functionality (including linked windowing and animated maps) in a free demonstration version that is restricted to viewing data from the National Atlas of Cancer Mortality, the Cancer Atlas Viewer, available from the TerraSeer website- <http://www.terraseer.com/products/atlasviewer.html>. [Contact: Dunrie Greiling at dunrie@terraseer.com]

III. GIS Outreach

[Editor: All requests for Public Health GIS User Group assistance are welcomed; readers are encouraged to respond directly to colleagues]

From **Brian Lawson**, Knox County Health Department: I work as an epidemiologist for the Knox County Health Department in Tennessee. We've been using GIS (ArcView) sporadically for a few years now. However, as you suggest in your newsletter, I feel that GIS has great value and should become more integrated into daily programmatic activities. In fact, we have gradually expanded our GIS library to include purchasing a Spatial Analyst extension as well as ArcPad (mobile GIS). Although I and a few staff members will seek structured training in these applications, I was hoping to visit with other local public health agencies who have "set the standard" by heavily incorporating GIS into their programs, particularly in the areas of infectious disease epidemiology and bioterrorism preparedness.

Toward this end, I was wondering if readers

might know of local public health departments, especially in the southeastern US, who stand out as models for integrating GIS into their programs. If so, I'd like to contact them to see if I could arrange a visit to determine how we might best proceed with our GIS strategic planning. [Editor: Any guidance for Brian would be appreciated; Contact: Brian, Epidemiologist, by email at address brian.lawson@knoxcounty.org]

From **Rob Meyers**, Health Canada: I was wondering if readers had any information pertaining to the use of GIS in emergency preparedness operation centres? Colleague Jeff Aramini is currently working to establish an emergency operations centre for Health Canada. He was wondering about linking GIS into the system and would like to make it compatible with the US model to ensure that it will function effectively on joint issues. I would appreciate any information in this area, or a contact with someone who may be knowledgeable. [Contact: Rob, Medical Geographer, Division of Foodborne, Waterborne, and Zoonotic Infections by email at address Rob_Meyers@hc-sc.gc.ca]

IV. Public Health GIS Presentations and Literature **NCHS Cartography and GIS Guest** **Lecture Series (live at NCHS)**

June 15, 2004 (save date). Kernel Density Estimation: A New Approach to Measuring Spatial Accessibility of Physicians in Urban Areas. Mark F. Guagliardo, PhD^a, Cynthia R. Ronzio, PhD^a, Ivan Cheung, PhD^b, and Elizabeth Chacko, PhD^b. [^aChildren's National Medical Center and The George Washington University Medical Center; ^bDepartment of Geography, The George Washington University]. **Abstract.** Surprisingly little is known about the role played by accessibility and availability of provider locations in the delivery of primary healthcare. Very basic questions remain unanswered. What is the longest acceptable distance or travel time to providers? What is the smallest effective ratio of providers to population in a community? How important are distance and supply relative to other barriers to care, such as affordability and cultural considerations? One reason for the lack of answers is that the spatial aspects of access to care are not carefully conceptualized and measured in studies of healthcare access and utilization.

We will briefly review and critique the measures of

accessibility and availability most commonly used in studies of healthcare access. We will explain why it is necessary to employ a combined measure of distance and supply, referred to as “spatial accessibility”, and why a combined measure is particularly important for congested urban areas. Most of the presentation will be dedicated to explaining density calculations—the various ways of creating map density layers in a GIS, and how the use of density layers present new opportunities for exploring the nature of spatial accessibility of healthcare locations.

There will be a live demonstration of simple density and kernel density layer creation using the built-in features of ESRI's ArcGIS 8.3 Spatial Analyst. Using data from the Washington, DC area we will create a kernel density layer of pediatric primary care providers and a kernel density layer of children's residences. Simple map algebra will be used to create a ratio of the two layers, which in effect is a demand-adjusted map of primary care supply in the city. The final layer reveals areas in need of additional providers.

Finally, we will discuss the shortcomings of the kernel density approach to the study of healthcare spatial accessibility, describe our plans for improving the method, and invite suggestions from the audience. [Contact: Mark at markg@gwu.edu]

CDC's Emerging Infectious Diseases and MMWR **Emerging Infectious Diseases**

Emerging Infectious Diseases (EID) is indexed in Index Medicus/Medline, Current Contents, Excerpta Medica, and other databases. Emerging Infectious Diseases is part of CDC's plan for combating emerging infectious diseases; one of the main goals of CDC's plan is to enhance communication of public health information about emerging diseases so that prevention measures can be implemented without delay. The May edition includes the article “**Syndromic surveillance in public health practice**,” by Heffernan R, Mostashari F, Das D, Karpati A, Kulldorff M, Weiss D, *Emerg Infect Dis* 10(5) 2004, and is available at the CDC EID website <http://www.cdc.gov/ncidod/EID/index.htm>].

Morbidity and Mortality Weekly Report

Selected articles from CDC's **Morbidity and Mortality Weekly Report** (MMWR): [Readers may subscribe to MMWR and other CDC reports, without cost, at site <http://www.cdc.gov/subscribe.html> as well as access the MMWR online at <http://www.cdc.gov/mmwr>]. Note:

Efforts are made to include themes which may lend themselves to spatial distribution. Vol. **53**(15)- Africa Malaria Day; Vol. **53** (Dispatch): Blood Lead Levels in Residents of Homes with Elevated Lead in Tap Water, District of Columbia, 2004; Vol. **53**(8)- Homicide Trends and Characteristics, Brazil, 1980-2002; Hypothermia-Related Deaths United States, 2003; Alcohol Use Among Adolescents and Adults, New Hampshire, 1991-2003.

Titles

Geostatistical Analysis of Chinese Cancer Mortality: Variogram, Kriging and Beyond, Lai D, *J Data Sci* 2(2), 177-193 APR 2004;

Dengue spatial and temporal patterns, French Guiana, 2001, Tran A, Deparis X, Dussart P, Morvan J, Rabarison P, Remy F, Polidori L, Gardon J, *Emerg Infect Dis* 10 (4): 615-621 APR 2004;

Statistical methods to analyze risk with spatial distribution patterns, Abellana RM, Ascaso C, *Med Clinica* 122: 68-72 Suppl. 1 2004;

The Hotspot Matrix: A Framework for the Spatio-Temporal Targeting of Crime Reduction, Ratcliffe JH, *Police PracRes* 5(1)5-23 March 2004;

The fertility transition in Egypt: Intraurban patterns in Cairo, Weeks JR, Getis A, Hill AG, Gadalla MS, Rashed T, *Ann Assoc Amer Geogr* 94 (1): 74-93 MAR 2004;

Geographic information systems and health applications, Khan OA, Skinner R, Griffin AL, *Ann Assoc Amer Geogr* 94 (1): 234-236 MAR 2004;

Where to go? Strategic modelling of access to emergency shelters in Mozambique, Gall M, *Disasters* 28 (1): 82-97 MAR 2004;

An accident waiting to happen: a spatial approach to proactive pedestrian planning, Schneider RJ, Ryznar RM, Khattak AJ, *Accident Anal Prev* 36 (2):193-211 MAR 2004;

Using geographic information systems and regression analysis to evaluate relationships between land use

and fecal coliform bacterial pollution, Kelsey H, Porter DE, Scott G, Neet M, White D *J Exp Mar Biol Ecol* 298 (2): 197-209 JAN 2004.

Annual Review of Public Health

April 2004, Volume 25 (selected papers)

-Developing and Using the Guide to Community Preventive Services: Lessons Learned About Evidence-Based Public Health, Briss PA, Brownson RC, Fielding JE, Zaza S, 25:281-02;

-Public Health Surveillance of Low-Frequency Populations, Andresen EM, Diehr PH, Luke DA;

-Statistical and Substantive Inferences in Public Health: Issues in the Application of Multilevel Models, Bingenheimer JB, Raudenbush SW;

-Housing and Public Health, Shaw M;

-The Current State of Public Health in China, Lee L. [Contents: <http://www.annualreviews.org/catalog/2004/pu25.asp>]

New Report

Mapping the Risks: Assessing the Homeland Security Implications of Publicly Available Geospatial Information, John Baker, Beth Lachman, David Frelinger, Kevin O'Connell, Alex Hou, Michael Tseng, David Orletsky, Charles Yost, RAND Corporation (Report # MG-142), Prepared for the National Geospatial-Intelligence Agency, 2004. **Publicly Available Federal Geospatial Information of Little Unique Use To Terrorists, Rand Study Finds-** Less than 1 percent of publicly available federal Web sites and databases contain geospatial information not readily available elsewhere that could help terrorists and other hostile forces mount attacks in the United States, according to a RAND Corporation study issued today. Geospatial information shows the location and describes key features of particular places--such as roads and bridges, power plants and power lines, office buildings and factories, military bases, mass transit systems, and parts of the natural environment like forests and lakes.

Although publicly available geospatial information on federal Web sites and in federal databases could potentially help terrorists select and locate a target, attackers are likely to need more detailed and current information--better acquired from direct observation or other sources, according to the RAND study. These other sources include textbooks, non-government Web sites, trade journals and street maps.

PUBLIC HEALTH GIS NEWS AND INFORMATION

May 2004 (No. 57)

8

RAND researchers also found no publicly accessible federal geospatial information deemed critical to meeting attackers' information needs. In addition, the researchers found only four publicly available federal databases that had information that is both useful to potential attackers and could not be obtained from other widely available sources. The four federal databases are no longer being made public by federal agencies.

In the wake of the Sept. 11, 2001 terrorist attacks in the United States, questions were raised about whether the federal government makes geospatial information so readily available that terrorists and other potential enemies could exploit this information to plan new attacks. Because of this concern, many federal agencies began restricting some of their publicly available geospatial information, particularly information accessible through the Internet.

The RAND report recommends the federal government work with state and local governments and the private sector to develop a consistent and uniform analytical process that could be used to evaluate the utility and risks associated with publicly available geospatial information. The report also discusses some of the project's specific case studies that highlight the complexities of these issues, including case studies of the Mineral Management Service (MMS) registry of offshore mining platforms and the U.S. Environmental Protection Agency's (EPA's) Toxics Release Inventory (TRI). *Most importantly, the study provides an analytical process that can be used to identify and evaluate potentially sensitive geospatial information.* [As of March 25, 2004, the summary and full report in PDF format are available at: <http://www.rand.org/publications/MG/MG142>; Contact: John Baker at jbaker@rand.org]

CDC's 2004 Environmental Public Health Tracking Conference

Philadelphia PA, March 24-26

Selected Presentations. Keynote: Ed Thompson, Deputy Director for Public Health Services, CDC, EPHT: From Vision to Reality; A 21st Century Public Health Defense: From Concept to Communities, Hearne SA, Trust Form America's Health (TFAH); Assessing Public Health Impact of Environmental Decisions Through Information Technology and Research, Zenick H, and Sonntag, Jr. WA, USEPA; Building a National Environmental Public Health Tracking Program, Qualters J; Building the Little Engine that Could, Condon SK, DOH; Land Use

Mapping as an Environmental Public Health Tracking Tool, Werner M, WI; Advances in Asthma Surveillance, Condon, SK, DOH; From Data Analysis and Visualization to Community Contribution: Advances in Birth Outcomes Surveillance, Roberts E, CA DOHS; Building a Pesticide-Exposure and Response Data System, MacDonald SC, WA State DOH; Moorman J, APRHB/CDC Asthma Surveillance at the National Level; Yeatts K, U North Carolina, Tracking Asthma and Wheezing-related School and Parental Work Absences; Lay AJ, NM DOH, Development of an Asthma-Air Quality Data Linkage Tool; Boscoe FP, NYS DOH, An Air Quality and Childhood Asthma Surveillance System for New York State: Preliminary Design Considerations; Rathouz P, U Chicago, Modeling Effects of Air Pollution on Acute Asthma Outcomes in Chicago; Williamson D, CDC, Studies of Autoimmune/Neurological Diseases in Communities Concerned about Environmental Exposure; Henry J, TX DOH, Challenges, Successes, and Issues: The Texas MS Surveillance Experience; Bekkedal MYV, WI DOH, Wisconsin's Application of Environmental Public Health Tracking to Multiple Sclerosis and Amyotrophic Lateral Sclerosis; Williams-Johnson M, CDC, Neurological Effects from Toxic Substances in Completed Exposure Pathways; Public Health and Natural Science-The Benefits of CDC/USGS Collaboration, Miller T, USGS Toxic Substances Hydrology Program; Air Quality Data for EPHT, Watkins T, Air and Mercury, USEPA; Technical and Conceptual Issues in Environmental Public Health Tracking: Where We Stand and Where We Are Heading, Kyle A, U California Berkeley (UCB); Effective Use of Models and Pollutant Monitoring for Exposure Tracking, McKone T, (UCB); Linking Exposure/Hazards and Health Outcomes, Mather FJ, Tulane U; Data Usage for Environmental Public Health Tracking: The Devil is in the Details, Resnick B, Johns Hopkins Bloomberg School of PH; English PB, CA DOHS Visualization and Analytic Methods for the Tracking of Birth Outcomes and Traffic Exposure; Dimmick F, USEPA Available Air Quality Observations-Air Monitoring and Satellite Data; Watkins T, USEPA Opportunities for Linking Air Quality and Public Health-Community Multiscale Air Quality (CMAQ) Model and Other Models; Blumenthal W, CDC, Eliminating Lead Poisoning through Improved Data Integration; Patridge J, MO DOH, Using Technology in the Fight to End Childhood Lead

PUBLIC HEALTH GIS NEWS AND INFORMATION

May 2004 (No. 57)

9

Poisoning in St. Louis City; Havlena J, WI Childhood Lead Poisoning Prevention Program Tracking Childhood Lead Testing and Poisoning in Wisconsin; Calvert GM, CDC Tracking Acute Pesticiderelated Illness in the US: The SENSOR-Pesticides Program; Alavanja MCR, NCI, The Agricultural Health Study Cohort: Use of Agricultural Pesticides and Associated Health Risks with an Emphasis on Lung Cancer; Kass DE, NYC DHMH, Linking Pesticide Hazard, Exposure and Health Outcomes Data in New York City-Early Report on the Development of a Tracking System; Jarup L, Imperial College London (ICL), The Small Area Health Statistics Unit and the EUROHEIS Project-an Overview; Beale L, ICL, GIS Methods-Use and Misuse; Richardson S, ICL, Statistical Methodology for Disease Mapping: Rate Smoothing and Issues of Sensitivity and Specificity; Best N, ICL, Statistical Modelling of Environment- Health Relationships: Handling Ecological Bias; Hambly P, ICL, The Rapid Inquiry Facility-A Tool for Environmental Health risk Assessment (Demonstration); Fitzgerald EF, NYS DOH, Birth Defects Surveillance and Environmental Public Health Tracking in New York State; Correa A, CDC, Temporal and Spatial Variations in Birth Defects in Atlanta; Krueger E, MA DOH Environmental/Development Disabilities Linkage Activities; Kingsley B, CDC, Cancer Clusters and Related Activities at CDC; Deapen D, NAACCR, State Cancer Registries and Environmental Public Health Tracking; Held J, NJ DEP, Potential Sources of Environmental Data; Hanrahan LP, WI DPH Childhood Cancer EPHT Demonstration Project; Braun KVN, CDC, Developmental Disabilities Surveillance: Methods and Results from the Metropolitan Atlanta Developmental Disabilities Surveillance Program (MADDSP); Scott KG, U Miami, The University of Miami Developmental Disabilities Database and the Value of Department of Education Data; Dozier B, CDC, The Family Educational Rights and Privacy Act (FERPA): Challenges in Data Sharing; Bove FJ, CDC, Environmental Etiologies Associated with Developmental Disabilities and the Brick Township, NJ Autism Cluster Investigation: Challenges in Identifying Environmental Etiologies.

Selected Posters (lead authors shown). Using Small Area Analysis to Estimate Asthma Prevalence in Chicago Public Schools, Brody TM., U.S. EPA; Heitgerd, JL, CDC, Assigning Geographic Coordinates to Unmatched Address Records; Boscoe FP, New York State DOH

(NYSDOH), Improving Spatial Resolution of Criteria Air Pollutant Monitoring Data; Walker R, NYSDOH, Air Pollution in New York State: An Environmental Hazard Assessment; Grady SC, NYSDOH, Air Quality Characterization for Environmental Health Assessments; Dimmick F, Using GIS in Public Health Decision Making: A Relative Pocket of Need Methodology; Schneider RH, Missouri DOH and Senior Services, GIS-Based Spatial Search for Environmental Health Research: Environmental Hazards and Birth Defects in Texas; Zhan FB, Texas State U, Arsenic in Drinking Water Data Linkage with Tumor Registry Data for New Mexico; Flowers H, NMDOH, Accommodating Rate Instability for Small Areas in Disease Mapping; Wartenberg D, Environmental and Occupational Health Sciences Institute, A Priori Estimation as a Cornerstone of Signal Recognition; Aldrich TE, U Louisville School of PH, Defining Hazards and Exposure for Health Tracking; McKone TE, UCB, Approaches for Evaluation of Multiple Source, Population-Based Surveillance of the Autism Spectrum Disorders (ASDs) in the United States; Braun KVN, ADDM CADDRE Network and CDC, Overview of Methodology for Multiple Source, Population-Based Surveillance of the Autism Spectrum Disorders (ASDs) in the United States ADDM CADDRE Network; Baio J, CDC, Surveillance for Asthma Using Emergency Department Data in South Carolina; Hurley D, U South Carolina, Preventing Occupational Illness Through Insurance Claims Analysis; DeVries AR, CDC, Using the BRFSS for Exposure Tracking: Experiences from Environmental Health BRFSS Questions in Washington State; Laflamme D, Washington State Department of Health (WSDOH), Canned Tuna Mercury Levels and Consumption Patterns in Washington State; VanDerslice J, Evaluating the Impact of a West Nile Virus Education and Outreach Campaign in Kansas: Implications for Environmental Public Health Education; Fox MH, U Kansas Medical Center; Utilization of the Toxic Exposure Surveillance System for Detection of Potential Chemical Terrorism Events; Belson M, CDC, A Model Sentinel Event Surveillance System in Louisville, KY; Groenewold M, Louisville Metro Health Department, Environmental Health Information Resources: NLM's Toxicology and Environmental Health Information Program; Arnesen SJ, NLM, Use of Existing Databases for the Purpose of Hazard Identification: An Example; Schreinemachers DM, U.S. EPA, If Follow-up

Is Needed for Pesticide Epidemiology Findings: Would Community HANES Help?; Allen RH, Cancer Prevention Through Risk Characterization: Environmental Mapping of Sources of Exposure to Cancer Causing Agents in Maryland; Brown S, Johns Hopkins U Bloomberg School of PH (JHBSPH), Multi-Disciplinary Model to Investigate Environmental Threats to Children's Health; Herbstman J, JHBSPH, Investigating Preterm Births and Air Pollution in Michigan; Wahl RL, Michigan Department of Community Health, America's Children and the Environment: Measures for Tracking Children's Environmental Health; Woodruff TJ, U.S. EPA, Catching Your Breath: Strategies to Reduce Environmental Factors that Contribute to Asthma in Children; Anderson H, Environmental Health Indicators: State of the Environment Report; Calderon RL, U.S. EPA, Environmental and Health Risk Communication in a Fenceline Community; White LE, Tulane School of PH and Tropical Medicine, Using Existing NGO Collaborations to Expand Public Health Awareness and Tracking Opportunities: A Case Study; Christensen JH, Institute for Agriculture and Trade Policy, Johns Hopkins Center for Excellence in Environmental Public Health Tracking, Assessing and Prioritizing Stakeholders Needs for Environmental Public Health Tracking; Malczewska-Toth B, Stakeholder Participation in Environmental Public Health Tracking: Results and Feedback from California's Pilot Project; Wong M, Understanding Community Environmental Health Data Needs Through Partnership; Chuk M, Physicians for Social Responsibility, A Conceptual Design for the New Mexico EPHT System; Bales CL, Automated Data Exchange System for Environmental Public Health Tracking Network in New York State: Functions, Specifications and Applications; Le LH, NYSDOH, Application for Assessing Environmental Public Health Indicators. [Editor: I apologize for all errors and omissions. The full program will be posted at <http://www.cdc.gov/nceh/tracking>]

Invited Paper

Using Small Area Analysis to Estimate Asthma Prevalence in Chicago Public Schools

Thomas M. Brody, Ph.D

Office of Information Services, Resources
Management Division, US EPA Region 5 MG-9J,
Chicago IL

Background. Despite the fact that over one in ten children have been told they have asthma in the United States, the nation still does not have a comprehensive surveillance program to determine the true number of children with the disease. Several programs such as hospitals, Medicaid, insurance companies, and pharmacies track *portions* of the epidemic. Hospital data describe asthmatic episodes that were severe enough to warrant an emergency room visit. Medicaid data describe asthma care in low-income populations. Insurance and pharmacy data describe the asthmatic population in their markets. However, none of these sources can describe the total burden of the epidemic.

Given the concerns over the suitability of these data, many researchers have turned to surveys to get a more holistic assessment of the asthma epidemic. Several surveys have been conducted from the national to the local level. However, national statistics do not lend themselves to describe local areas, and local surveys are difficult to combine to provide a larger picture.

Nonetheless, several programs need to make decisions on how to best use their resources and establish points of intervention. Without a comprehensive surveillance program to assess the asthma epidemic across wide areas, it is necessary to estimate the number of children with this disease using small area analysis.

Method.

Small Area Analysis is the term often used in the literature to define the broad range of methods that use data sources, statistical techniques, and computer applications to determine the number of events occurring in an area through comparisons with similar or larger area benchmarks (WIDHFS, 2003). Typically, *small areas* refer to county and sub county areas like cities, zip code areas, census tracts, or even smaller units (Murdock and Ellis, 1991). A recent text by Siegel provides an excellent review of these methods and their uses in describing health characteristics (Siegel, 2002).

The Small Area Analysis model used in this work is referred to in the literature as the *synthetic method*. The synthetic method creates an estimate of the population having a health characteristic in a small area by applying proportions of the population having the health characteristic in one or more demographic categories (age, sex, race, etc.) in a larger area to population figures for these demographic categories in the small area (ibid, 497).

For this work, demographic proportions of asthmatic population from the Sample Child Person Section (SCP) of the Center for Disease Control and Prevention's 1998 National Health Interview Survey (NHIS) were synthesized with similar demographic categories in the US Department of Education's Common Core Data (CCD) to estimate the burden of asthma in Chicago schools. The CCD is a complete annual public school census of children broken down by several traits including gender, grade, and race.

In 1998, the SCP contained a nationwide sample of 13,643 children. In this sample, 1,629 of the children had been told they have asthma in the past (cumulative prevalence), 740 had an episode of asthma in the past year (one year period prevalence), and 270 needed to visit the emergency room during the previous year's attack (one year severe period prevalence). Each of these prevalence types was stratified by the demographic categories of grade, race, and gender. Specifically, proportions of the population having cumulative, one year period, and severe one year period prevalence of asthma were calculated for: male and female; White, Black, Hispanic, Native American, and Asian; and grades pre-kindergarten through 12. The question of grade in the SCP survey asked for the highest level of school completed, so each given grade represented a person in the grade above. Unfortunately, that meant that pre-kindergarteners and kindergarteners had to be aggregated to create a single rate.

Additionally, it was thought that the model should include a sense of geography in order to account for the environmental features of Chicago. The most geographically specific information in the SCP is the subset of persons that live in a Consolidated Metropolitan Statistical Areas (CMSAs) above 250,000 in population in the Midwest Region. The CMSAs in this set include Chicago, as well as Indianapolis, Wichita, Detroit, Minneapolis/St. Paul, St. Louis (MO), Kansas City (MO), Omaha, Toledo, Cleveland, Columbus, Cincinnati, and Milwaukee. These areas all have similar climate, terrain, and population density. Therefore, it was assumed that proportions taken to reflect the geography of these cities reflected the same proportions for Chicago alone.

In the model, the rates of each stratified demographic category and the population in each school for each prevalence type were multiplied together to

create the asthma population in the school for the prevalence type. The resulting three total universes (grade, race, and gender) were divided by three assuming that each category independently affects an asthma

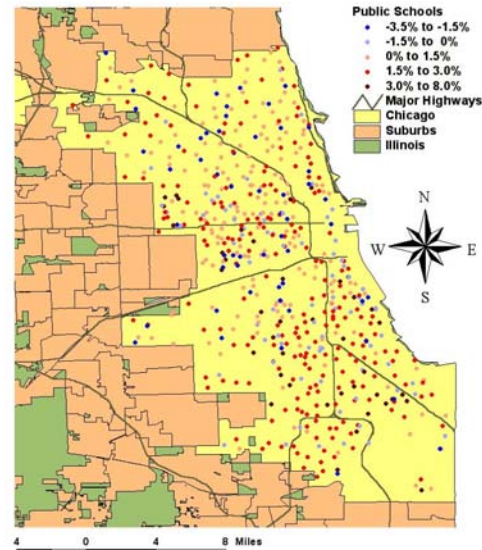


Figure 1: Difference Between Expected Cumulative Prevalence Rate of Asthma In Chicago Schools and the National Rate in 1998.

outcome. The resulting population was then multiplied by the ratio of the asthma rate from the CMSAs above 250,000 in population in the Midwest Region over the national asthma rates for each prevalence type in order to weigh the outcome with more specific location based information.

After the estimates were derived, the results were placed in a Geographic Information System (GIS) containing the address matched Chicago schools from the CCD. The Chicago records in the CCD were matched to addresses using ArcView 3.2 and the Wessex 6.0 data set. The program address matched approximately 90% of the data. The additional addresses were individually matched using Mapblast at www.mapblast.com. Finally, the asthma estimates were joined with the 593 public schools in the GIS.

Results

The stratified rates from the Sample Child Person file indicated that males have higher asthma rates than females; Native Americans have the highest cumulative and one year period prevalence rates of asthma, followed by Blacks, Whites, Hispanics, and Asians. However, Blacks surpass Native Americans and Hispanics surpass

Whites in severe period prevalence of asthma. The cumulative and one year period prevalence rates increased through the early school years, peaking in the seventh grade and then declining. Rates of severe asthma tend to decline as grades increase. The fact that the population was in a CMSA above 250,000 in population in the Midwest Region slightly decreased the cumulative and one year period prevalence rates while only slightly increasing the severe period prevalence rates when compared to the national rates.

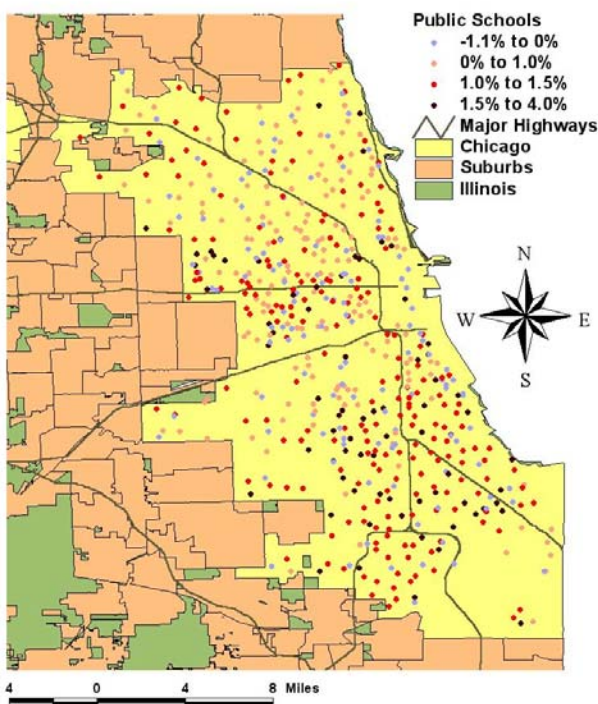


Figure 2: Difference Between Expected Period Prevalence Rate of Asthma In Chicago Schools and the National Rate in 1998.

Some of the outputs of the GIS are shown in Figures 1 and 2. The estimates show higher rates on the south and west sides of Chicago, as is fairly well known through previous analysis (Geist, 1999). However, the populations are made much more explicit in these products, with some schools in these areas having estimates below the national level. These products are important because they go beyond what data and surveys can do separately. By estimating the rates of each school's asthmatic population, effective points of intervention can be explicitly described to make specific allocation decisions over large areas.

Next Steps

Several additional areas of analysis would be of interest from this work. First, the modeled estimates should be compared with school nurse data or other surveillance information on the number of students with asthma. Although asthma surveillance experts have seen school nurse data as an undercount of the true asthmatic population, it would be beneficial to compare empirical data with the estimates for validation and possible intervention.

Second, the methods described in this paper could be used in a nationwide asthma prevalence estimation project. Of course the additional analysis would require a sufficient geocoded data set of the entire CCD as well as model refinements. It is hoped that this work will lead to interest in developing a national set of geocoded schools to broaden the scale of the project.

Third, asthma exacerbating factors in the indoor and outdoor school environment should be incorporated in the GIS. This analysis would not necessarily show cause and effect, but link these indicators in a tool that allows multiple stressors to school children to be viewed at the same time.

Finally, and most importantly, the numbers reported in this paper are estimates derived from a modeling effort. Only an effective surveillance program will establish the true rates and variances in these small areas. Recent legislation has now made it possible for such a network to be developed nationally (CDC 2003). Hopefully, in time, a much better understanding of the national asthma epidemic in children will come from this information network.

References

CDC's National Center for Environmental Health. CDC's Environmental Public Health Tracking Program-Background. 2/2003 at <http://www.cdc.gov/nceh/tracking/background.htm> (2003); Geist M. Chicago Asthma Consortium. In: Report of the Second Annual Data Workshop. Asthma Prevalence accessed 2/2003 at <http://chicagoasthma.org/2ndwrkshp.pdf> (1999); Murdock SH and Ellis DR. Applied Demography. Boulder: Westview Press, 1991; Siegel JS. Applied Demography: Applications to Business, Government, Law and Public Policy. San Diego: Academic Press, 2002, 489-508; Smith SK. Small-Area Demography. In: Encyclopedia of Population, Demeny P and McNicoll G, ed. Farmington Hills, MI: Macmillan Reference, 2003; Wisconsin Department of Health and Family Services, Small Area Analysis in Southeastern Wisconsin, 1992-1994: Section 2. What is Small Area Analysis? at <http://www.dhfs.state.wi.us/healthcareinfo>. **Acknowledgments.** Any opinions, findings, and conclusions or

recommendations expressed in this paper are those of the author and do not necessarily reflect the views of supporting agencies. Without implication, several members of the Chicago Asthma Consortium and US Environmental Protection Agency provided the scope and direction for this project. Their guidance was very much appreciated. Dr. Sandra Thomas, Dr. Victoria Persky, Dr. Arthur Lubin, and Ms. Sheila Batka deserve a special note of thanks for their assistance in reviewing this work. [Contact: Tom, Environmental Systems Engineer, at brody.tom@epa.gov]

V. Related Census, HHS, FGDC and Other Federal/State Developments

Statement (excerpts) of Charles G. Groat, Director, U.S. Geological Survey, before the House Appropriations Subcommittee on Interior and related agencies, March 17, 2004

125th ANNIVERSARY OF THE USGS

Since March 3, 1879, the USGS has provided the people and communities of the United States with the science information they need to make important individual and public decisions and to safeguard society. In 1879, the Federal Government held title to more than 1.2 billion acres of land, nearly all of it west of the Mississippi River. Only 200 million acres of this land had been surveyed.



The USGS has accomplished a great deal since that time. We have produced 55,000 topographic maps that represent the topographic coverage of the Nation. We now have available on-line more than 181 million individual daily streamflow values, measured at more than 21,000 locations throughout the United States, and operate more than 7,000

streamgages nationwide. This past year the USGS located more than 30,000 earthquakes worldwide by collecting data from an integrated system of national and international seismic networks.

Science Information for Decision Making

Through *The National Map*, we are making excellent progress in refocusing our efforts to provide a common set of current, accurate, and consistent basic geospatial data that meets the Nation's needs in the 21st century. A keystone of this approach is partnerships with State and local governments and the private sector. For example, USGS imagery is used to support the current geographic data needs of North Carolina's urban areas and yielded local participation in the form of data and matching

resources. The participants range from metropolitan Mecklenburg and Wake Counties to rural Henderson County. There are similar results from 21 other States and the District of Columbia. As proposed by the President, it is vital that we capitalize on these early successes by reinvesting the savings from our recent buy-out offer to establish new State and local government partnerships to further *The National Map* and to increase the use of the private sector to integrate data and to develop data where no other sources of data exist.

The USGS is taking a leadership role in the battle against harmful invasive plants, animals, and wildlife diseases in the U.S. Our new **National Institute of Invasive Species Science** is working with States, other agencies, non-government organizations, and citizen groups to map tamarisk (salt cedar), Russian olive, and cheatgrass in the western U.S. As you know, tamarisk and Russian olive steal water and degrade wildlife habitat, while cheatgrass devalues rangelands and promotes wildfires. The USGS is completing the first assessment of invasive species threats in the 554 units of National Wildlife Refuge System. We have also developed a long-term partnership with scientists at NASA Goddard Space Flight Center to better predict the distribution and spread of invasive species throughout the United States. In 2003, scientists from the USGS, NASA, and Colorado State University began testing predictive models to map invasive plant species "hotspots" throughout Colorado, expanding the work in 2004 to the Western U.S.

The USGS has just completed a study (USGS Circular 1243) that documents water-level changes in the **High Plains aquifer**. The High Plains aquifer provides the water to irrigate crops on about 27 percent of the irrigated land in the United States and provides drinking water to 82 percent of the people who live within its boundaries. The intense use of ground water has caused major declines in ground-water levels, raising concerns about the long-term sustainability of irrigated agriculture in many areas of the High Plains. The changes are particularly evident in the central and southern parts of the High Plains, where more than 50 percent of the aquifer has been dewatered in some areas. Our plans for the assessment of water availability and water use propose that we provide similar assessments of other important aquifers of the Nation.

Real-time Technology

PUBLIC HEALTH GIS NEWS AND INFORMATION

May 2004 (No. 57)

14

In 2003, in Washington, the USGS worked with the National Weather Service and local agencies to combine **detailed digital elevation models (produced by high-resolution LIDAR mapping)** with a robust, efficient, two-dimensional flow model to predict the extent of forecasted floods before the floods began. This technique enables residents and emergency officials to determine what areas need to be evacuated and when. This remarkable technology is transferable to any location with high-quality LIDAR data to define the topography of the downstream floodplains.

A team of USGS and NASA scientists investigating the impacts of Hurricane Isabel also used this technology. Two days prior to landfall last year, and two days after landfall, the beaches and dunes of Virginia and North Carolina were surveyed with NASA's EAARL (Experimental Advanced Airborne Research Lidar). Detailed measurements captured the extreme changes that occurred along the coast, including the development of a major breach that severed Hatteras Island and North Carolina Highway 12. These data are being used to quantify the changes and to test models that predict the impact of extreme storms on the hurricane-threatened coasts of the southeast United States.

There have been technical advances in streamflow measurement techniques; the most significant has been the deployment of **acoustic Doppler current profilers (ADCs)**. These technologies add to our efficiency. For example, in the summer of 2004, the USGS Indiana office deployed field crews to measure streams during record flooding. The crews made 55 measurements over seven days, two or three times more measurements than could be made using older technology.

In 2003, Ventura, San Bernardino, and San Diego counties in California were first hit with extensive fires, then with severe rainfall. This caused massive and deadly debris flows. In the weeks following these wild fires, the USGS took definitive steps to analyze the hydrologic hazards they created and installed a network of 20 rapid deployment-recording rain gages and six discharge-gaging stations in burned basins. These stations and approximately 60 existing streamgaging stations are providing important data to the counties' Alert Systems in real-time.

Earthquake science and seismic technology have advanced greatly in the past 30 years. The USGS is

currently working to install an **advanced National Seismic System (ANSS)** that includes advanced seismic monitoring instruments in earthquake-prone regions such as Los Angeles, San Francisco, Seattle, Anchorage, Salt Lake City, Memphis, and St. Louis. This instrumentation will mitigate risk, enable better understanding of the damage caused by shaking, and help engineers create stronger and sounder structures to save vital utility and communication networks. The ANSS instruments will give emergency response personnel real-time maps of ground shaking immediately following earthquakes—getting the right people to the areas of greatest damage. [Contact: Gail A Wendt at gwendt@usgs.gov; See: <http://www.usgs.gov/125>]

Federal Geographic Data Committee (FGDC)

[The Federal Geographic Data Committee (FGDC) is an interagency committee, organized in 1990 under OMB Circular A-16, which promotes the coordinated use, sharing, and dissemination of geospatial data on a national basis. The FGDC is composed of representatives from seventeen Cabinet level and independent federal agencies. The FGDC coordinates the development of the National Spatial Data Infrastructure (NSDI). The NSDI encompasses policies, standards, and procedures for organizations to cooperatively produce and share geographic data. The 19 federal agencies that make up the FGDC, including HHS, are developing the NSDI in cooperation with organizations from state, local and tribal governments, the academic community, and the private sector. See <http://www.fgdc.gov>]

A Geospatial Strategy for the Nation: Defining the Goals of NSDI

Ivan B. DeLoatch, Staff Director, Federal Geographic Data Committee (FGDC)

In 2003, the FGDC was charged to pursue a **NSDI Future Directions Initiative**. The purpose of the initiative is to craft a national strategy and action plan to further the development of the NSDI. Ideas and perspectives were solicited and collected through interviews, coordination group meetings, workshops, forums, staff meetings and conferences. As a result, the target goals that have emerged represent the collective thinking of multiple segments of the geospatial community. Themes heard repeatedly include: Forging Partnerships with Purpose, Making Framework Real, and Delivering the Message. These themes provide the structure for the target goals:

Forging Partnerships with Purpose.

By 2007, the NSDI is guided by a governance model that includes all stakeholder groups; By 2005, identify and act upon options for restructuring the FGDC to make it more effective; By 2006, agreements are in place to facilitate participation of the private sector and utility industry in building the NSDI; By 2007, 10 non-geospatial national organizations are engaged/involved in the NSDI.

Making Framework Real

By 2007, the nation (all fifty states and U.S. held territories) will have a program in place for generating the framework data themes. This program will define the processes for nationwide collection of framework data and related themes of national significance, for documentation of data according to accepted standards, and for making the data accessible through the Geospatial One-Stop portal; By 2005, ANSI endorsed content standards for data are adopted by the Federal agencies for framework data; By 2006, FGDC accepted metadata standards are being used by 95% of participating data providers; By 2007, 50% of 133 urban areas will have data for all framework themes; By 2007, ANSI endorsed content standards for additional data themes of national significance as identified in revised OMB Circular A-16 are adopted by the Federal Agencies; By 2007, 20 tribal coordination infrastructures are in place contributing to the NSDI; By 2007, 50+ state/territory coordination infrastructures are in place contributing to the NSDI.

Delivering the Message

By 2005, develop and publish an understandable business case for all sectors (government, business and academia) that addresses the need for framework data and articulates its value [Business case includes: Articulated value of spatial data within operations; Cost benefit analysis of what we're doing; Case studies; Investments and cost savings]; By 2005, develop and implement a communications and outreach action plan. [Plan must include: Message development and distribution; Communication vehicles; Identified audiences; Responsibilities and timeframes]; By 2006, institute a formal and comprehensive education and training program to support implementation of framework standards and national initiatives to develop the NSDI. [Target audiences; Content and depth; Geographic locations]

The FGDC requests all interested persons or groups to consider each of these goals and respond according to the following measures: (1) Why is this goal

important? (2) How can your organization contribute to achieving this goal? and, (3) Should this goal move forward? [Your comments are welcome and should be directed ASAP to Alison Kiernan Dishman at adishman@fgdc.gov; additional information on the NSDI Future Directions Initiative is available at <http://www.fgdc.gov/FutureDirections>]

2004 NSDI Cooperative Agreements Program (CAP) Funding Open for Submission

The 2004 Cooperative Agreements Program (CAP) is now open for submissions. This year, the CAP is jointly sponsored by the Federal Geographic Data Committee (FGDC), Geospatial One-Stop, and the US Geological Survey on behalf of The National Map.

The FGDC, Geospatial One-Stop, and The National Map are national geospatial initiatives with Federal leadership that share the common goal of building the National Spatial Data Infrastructure (NSDI). The NSDI consists of the technologies, policies, and people necessary to effectively discover, share, maintain and use digital geographic data throughout all sectors of the geospatial data community in the distributed electronic environment.

The CAP provides seed funds to engage organizations in building the components of the NSDI, which include the development of metadata, strengthening geospatial coordination, use of OpenGIS web mapping and web feature services, and encouraging participation in The National Map. A total of \$1,500,000 is available for funding this year. Approximately 50 awards are expected. The CAP is open to all U.S. organizations and seeks new participants.

The proposal submission period will close on or about June 4, 2004. Information describing the 2004 CAP will be found on-line at the FGDC and Grants.gov websites. [Contact David Painter, Program Coordinator, at dpainter@fgdc.gov or visit www.fgdc.gov]

*FGDC Initiative
Announcement*

“Guidelines for Providing Appropriate Access to Geospatial Data in Response to Security Concerns”

The Federal Geographic Data Committee invites comments on “Guidelines for Providing Appropriate Access to Geospatial Data in Response to Security Concerns.” The guidelines provide procedures to identify sensitive information content of geospatial data sets.

Should such content be identified, the guidelines help organizations decide what access to provide to such data sets and still protect sensitive information content. The geospatial data community's use of a common approach to identify data sets that have sensitive content and to provide appropriate access to such data will increase the effectiveness of individual organization's actions.

Frequently Asked Questions

What issues do the guidelines address? Since the events of September 11, 2001, public, private, and non-profit organizations have had heightened concerns that publicly available geospatial data might increase the vulnerability of the Nation. The organizations vary greatly in the particular concerns they have identified, the basis on which they make decisions, and the actions they have taken. There has been little interaction among organizations to reach consensus on a reasonable approach to address their concerns. Organizations have taken contradictory actions that tend to cancel the effectiveness of each organization's individual action. Often there has been an overreaction to the possibility that a data set will increase vulnerability, resulting in the benefits of data being denied to the larger community because of over-restriction of access. Differing views on data sensitivity and appropriate restrictions are increasing the already difficult problems of developing partnerships within the community.

How do the guidelines address these issues? The goal of the guidelines is to maximize access to geospatial data and provide appropriate restrictions on the small portion of these data that pose risks to security. The guidelines are a first effort to develop a consensus in the geospatial data community on a common framework for identifying geospatial data that are sensitive, deciding if restrictions are warranted, and choosing appropriate restrictions. They also warn against poor practices that are beginning to occur, such as adding disinformation to geospatial data.

Under what authorities would organizations implement the guidelines? Organizations use the guidelines to make decisions that are permitted by existing authorities. The guidelines do not grant new authorities. For this reason, appeals about decisions would be made using procedures available under the authority cited by the originating organization.

What is the best source of additional information on the content of the guidelines? The guidelines begin with

five pages of background information. This information includes the purpose, organization, reason for development, policy premise, audience, terminology, concerns not addressed, authority, and timeframe for the guidelines.

About the Role of the Federal Geographic Data Committee (FGDC) in the Guidelines

Why is this topic being brought to the attention of the FGDC? The lack of consensus on this topic and resulting confusion in the community is making more difficult the already hard task of developing the interagency, intergovernmental, and inter-sector partnerships needed to develop the National Spatial Data Infrastructure (NSDI). The FGDC is the interagency committee responsible for facilitating activities related to OMB Circular A-16 and implementation of the NSDI.

Could other organizations issue the guidelines? Decisions on the topic affect a broad cross-section of data producers, users, and intermediaries in the geospatial community. The decentralized nature of the community, including decisions about sharing data, result in no single organization having the authority to impose a solution. We have not identified any other efforts to issue such guidelines to the geospatial data community. Federal agencies are prominent members of the community, and these agencies are among those taking varied approaches and dealing with the complications caused by a lack of consensus. The FGDC is unique in having the breadth of participation to help the community reach consensus.

Does FGDC have the authority to issue guidelines, and has it done so previously? The FGDC issues the guidelines under the authority provided by OMB Circular A-16 to establish procedures necessary and sufficient to carry out interagency coordination and the implementation of the NSDI. The FGDC has issued guidelines and policy statements on topics such as federal geographic data sharing, the protection of personal information privacy, managing historical geospatial records, and support for international infrastructure activities.

About the Development of the Guidelines

What group developed the guidelines? An intergovernmental group under the FGDC Homeland Security Working Group developed the guidelines. The group includes members from Federal agencies, state and local government, and Federal depository libraries.

What information did the group consider while drafting the guidelines?

PUBLIC HEALTH GIS NEWS AND INFORMATION

May 2004 (No. 57)

17

- For the underlying principles and policy context, the group considered broad Federal laws, executive orders, and implementing instructions regarding freedom of information and public records; information management; the public's right to participate in government policy development and decision making; the public's right to review information used in government decision making; the public's "right to know"; protection of sensitive information for national security and homeland security reasons; prohibition of transactions with persons who commit, threaten to commit, or support terrorism; and government depository libraries. The appendix to the guidelines contains a sample list of these policies.

- For ideas of topics to include (and not to include) in the guidelines and a sense of how organizations have dealt with these issues to date, the group solicited and reviewed formal, informal, and draft guidelines from Federal, state, and local government agencies.

- For a framework to assess the risk of data, the group reviewed analyses from the RAND Corporation report "*Mapping the Risks: Assessing the Homeland Security Implications of Publicly Available Geospatial Information*" (RAND Report MG-142 NGA 2004; the report from the study is available through <http://www.rand.org/publications/MG/MG142>). The FGDC group interacted with the RAND team during the study.

- For the approach of using a graphical "decision tree" as the basis for the guidelines, the group took advantage of previous work by the National States Geographic Information Council. The group also took advantage of member's knowledge and contacts.

What is the schedule for the guidelines? Current: March 2004- FGDC Coordination Group receives guidelines and related briefing; April 2004- Notify FGDC steering committee members of plans for public review; April/May 2004- Sponsor a 30-day public review for guidelines. The review will be initiated by an announcement in the Federal Register; May/June 2004- Analyze comments and revise guidelines. Obtain agency clearance on final guidelines; and, June 2004- Provide final guidelines to the FGDC steering committee for adoption. [[The 13-page guidelines and two pages of instructions for comment are available for downloading through site <http://www.fgdc.gov/fgdc/homeland/index.html>.

Comments must be received on or before June 2, 2004. Submit all comments to guidelines@fgdc.gov; Contact:

Michael Domaratz, Co-chair, FGDC Homeland Security Working Group, at 703-648-4434 or mdomaratz@usgs.gov]

Web Site(s) of Interest for this Edition

<http://gis.cancer.gov> The **GIS Special Interest Group (GISSIG)** at the National Cancer Institute has expanded to include staff in other NIH institutes, NCI contractors, local government GIS staff, and professors at local universities active in the GIS area. The goal of this site is to serve as a central source of information about GIS and related resources. It consists primarily of links to other relevant sites.

<http://www.govtalk.gov.uk> Metadata UK. Joined-up government needs joined-up information systems. The **e-Government Metadata Standard (e-GMS)** lays down the elements, refinements and encoding schemes to be used by government officers when creating metadata for their information resources or when designing search systems for information systems.

<http://dmap.nrlssc.navy.mil/dmap/idx.jsp> The Digital Mapping, Charting and Geodesy Analysis Program (DMAP) team is part of the Naval Research Laboratory's Mapping Branch and is especially focused on advanced object-oriented modeling, database design, advanced geospatial portal implementation, environmental data dissemination, emerging digital mapping standards, and technical reviews for Navy usage of geospatial information. DMAP is the team responsible for developing the **Geospatial Information Database (GIDB) Portal System**, simultaneously connected to the most disparate sources of geospatial information available and with no licensing, which you can access by choosing one of the three user interfaces. [See production implementation for National Guard Bureau below]

<http://ngbcdmaps.gtri.gatech.edu> **National Guard Bureau Counter Drug (NGB CD) Geographic Data Server (GDS)**. The GDS utilizes state-of-the-art Worldwide Web technology to enable users to browse and analyze digital map data. This web page contains links to basic maps and data that are available currently for use by all DLEA personnel. *Please remember*-this is a GIS Portal and as such no data is hosted on it. [Editor: This site offers many geospatial database linkages of possible interest]

<http://www.homelanddefenseradio.com> The **Homeland Defense Radio.com** broadcasts live 24/7 coast-to-coast. It brings you exclusive interviews with key homeland security decision makers, new technologies, important challenges as well as the daily news.

<http://www.ipums.umn.edu> **Integrated Public Use Microdata Series (IPUMS-98)**, created at the University of Minnesota. The IPUMS consists of twenty-seven high-precision samples of the American population drawn from fourteen federal censuses. Some of these samples have existed for years, and others were created specifically for this database. The twenty-seven samples, which span the censuses of 1850 to 2000, collectively comprise a rich source of quantitative information on long-term changes in the American population.

<http://www.icpsr.umich.edu/NACJD/crimestat.html> This site provides free download of *CrimeStat*[®], a spatial statistics program for the analysis of crime incident locations developed by Ned Levine & Associates under grants from the National Institute of Justice. The program is Windows-based and interfaces with most desktop GIS programs. The purpose is to provide supplemental statistical tools to aid law enforcement agencies and criminal justice researchers in their crime mapping efforts but also can be applied to public health. An updated version is expected by Fall 2004.

<http://healthyamericans.org> Trust for America's Health (TFAH) is a non-profit, non-partisan organization dedicated to saving lives by protecting the health of every community and working to make disease prevention a

national priority. The **"How Healthy is Your State"** provides readers a standardized profile where states receive a grade based on their activities related to birth defects, asthma, cancer and other chronic diseases.

<http://www.baama.org> The Bay Area Mapping Association (BAAMA) is the vital organization of GIS professionals in the San Francisco Bay Region that promotes partnerships and teamwork with users of GIS technology to improve the environment and community. Their mission is to be the primary forum of the San Francisco Bay Region geospatial community that provides education for professional development; networking opportunities; leadership, coordination, and representation. For example, their May 27, 2004 meeting on **GIS and Public Health**, in Oakland CA, includes a distinguished panel of experts from the US Department of Health and Human Services, Lawrence Livermore National Laboratory, NASA Ames Research Center's Center for Health Applications of Aerospace Related Technologies, and the VVAF's Information Management and Mine Action Programs.

http://vvaf.policy.net/humanitarian/immap_report_1/ First in the series of reports, "Navigating Post-Conflict Environments: Humanitarian Information Management," written by VVAF's (Vietnam Veterans of America Foundation) Information Management and Mine Action Program]

Final Thoughts

Advancing Public Health's Geospatial Infrastructure: Recent Activities in the Department of Health and Human Services

Several recent activities in the Department of Health and Human Services (HHS) indicate that the public health part of our nation's National Spatial Data Infrastructure (NSDI) is in active mode. State and local public health departments, especially, will be pleased to know these activities are occurring at the highest levels of HHS. These involve (1) the use of geospatial technology for rapid response to national and global disease events and public health emergencies, and (2) the development of a HHS web-searchable geospatial database compliant with requirements of the Federal Geographic Data Committee (FGDC) Clearinghouse.

I. HHS Secretary's Command Center:

Geospatial Information Sharing for Rapid Assessment and Response

I had the opportunity March 11, 2004 to visit the HHS Secretary's (Tommy Thompson) Command Center (SCC) and view this relatively recent initiative which only has been operational for little more than one year. It was an impressive

PUBLIC HEALTH GIS NEWS AND INFORMATION

May 2004 (No. 58)

19

display of geospatial technology, with wall-to-wall plasma screen GIS maps being updated in real time. The visit became particularly memorable when Secretary Thompson made an unannounced entrance with Senators Joe Biden (DE), Ranking Member of the Foreign Relations Committee and Orin Hatch (UT), Chairman of the Senate Judiciary Committee and a senior member of the Select Committee on Intelligence. Secretary Thompson was excited to show off the mapping technology and the senators were as excited to see it. In seconds, situation maps were displayed on screens and Senator Biden was able to identify local hospitals where Delaware residents could receive services in event of a natural or man-made emergency. Both senators were impressed by the quick change to a large scale orthophoto image of Washington, D.C. showing the National Mall and the area surrounding the Capitol. Under emergency conditions, this map can be instrumental for the overlay of modeling chemical or biological releases and their potential impacts, based on real-time weather conditions. During their visit, I heard the senators remark they "thought the SCC was simply great" and it was "an excellent demonstration of advanced technologies used by HHS to assure public health readiness."

To learn more about the business functions and capabilities of the SCC, I spoke with Dean Ross, SCC Director, Lieutenant Todd Raziano, a former geospatial analyst with CDC's Agency for Toxic Substances and Disease Registry (ATSDR), and Commander Bill Henriques (previously serving as the CDC/ATSDR GIS Coordinator recently reassigned to the HHS Office of the Assistant Secretary for Public Health Preparedness), who assist with the daily SCC operations (see photo, l-r myself, Bill, Dean and Todd). From GIS workstations at the rear of the room, images are displayed on the front video wall containing 10 plasma screens that can create virtual images of public health scenes as large as 7 x 24 feet. Public health emergencies are monitored through 4,000 television channels around the world. On a side wall, six TV monitors remain active at all times and include CNN, MSNBC, Fox News, Weather, WeatherNet and Al Jazirra.

The key to SCC success is the timely communication and sharing of public health information, typically interpreted by geospatial public health professionals and compiled into maps for rapid decision-making and response by senior health officials. For example, live geospatial feeds can visualize ongoing California wildfires and be utilized to actively model the impact of these disasters and to assess their impact on the surrounding populations and public health assets. The SCC also uses video-conferencing technologies, a critical piece of SCC communication infrastructure. During the SARS outbreak, Secretary Thompson conducted face-to-face videoconferences with the Chinese Minister of Health in Beijing to obtain the most up-to-date information on the SARS epidemic. During the SARS outbreak, videoconferences with CDC's Director, Dr. Julie Gerberding and other public health partners were conducted daily. Diseases being tracked on the GIS screens during my visit included Avian influenza (3 different strains), West Nile Virus human disease cases, and geospatial information depicting potential areas of concern for Bovine Spongiform Encephalopathy or "mad cow" (based on Health Canada and Food and Drug Administration reports).

Many SCC partners provide communication through regular briefings with SCC and through a web-based incident management portal. Partnering agencies include the Joint Task Force-Civil Support-Northern Command (JTF-CS NORTHCOM), Department of Defense, Department of State, Department of Homeland Security, US Environmental Protection Agency, US Geological Survey, American Hospital Association, American Association of Blood Banks, American Red Cross, National Association of County and City Health Officials, Association of State and Territorial Health Officials and others.



PUBLIC HEALTH GIS NEWS AND INFORMATION

May 2004 (No. 58)

20

The sharing of information to support rapid analysis and decision making during public health emergencies is crucial to preparedness and response, and nowhere could this be more important than among HHS agencies and their partners. The flow of information about events which occur locally are georeferenced and tracked nationally-in a matter of minutes. For example, state health officials or the CDC's Epidemic Intelligence Service (EIS) officers working in the field report their findings directly to CDC headquarters, which in turn reports directly to the Secretary's Command Center. Through this partnering structure, the SCC can integrate various sources of information (many in real time) for geospatial display, analysis and field remediation.

SCC staff are aware and knowledgeable of concerns for privacy, and related issues of data granularity and audience, in the sharing of geospatial information. Their goal is to make data sharing secure but inclusive. All HHS agencies, federal, state and local, have a vested interest in contributing information to the SCC in time of need. This means there can be a responsive flow of geospatial information from state and local settings to the SCC for the efficient deployment of public health assets e.g., facilities and resources, in response to emergency and life-threatening events. Geospatial data information sharing is essential to advancing the role of public health in building our National Spatial Data Infrastructure (NSDI) and the wellbeing of our nation. I believe the HHS Secretary's Command Center will help public health achieve these goals.

II. HHS Web-Searchable Geospatial Data: New Initiative to Support FGDC Clearinghouse

The Department of Health and Human Services (HHS) is currently developing a plan for distributed Internet discovery of information on public health geospatial data holdings. This is a timely initiative by HHS which, when operational, will be compliant with OMB's Federal Geographic Data Committee (FGDC) Clearinghouse requirements. The discovery of geospatial holdings or assets is a function of standardized metadata, one of the six (e.g., clearinghouse, standards, framework, geospatial data, partnerships) building blocks or common elements of the National Spatial Data Infrastructure (NSDI). I will be brief because this task is in the assessment and planning stage. However, it demonstrates HHS leadership of a key piece of architecture that will help build the public health part of NSDI.

The use of Web-searchable standardized metadata, or informational elements to describe geospatial products, serves a variety of important purposes. For HHS, it is essential to the reduction and elimination of constituent agency data silos, improvement of cost-inefficiencies in geospatial research and planning, and accountability of geospatial data investments. This development will bring HHS onboard with other already Web-established geospatially active federal agencies and assure open public access to public health geospatial government information. One can begin to grasp the profound benefits of having each agency's information reside in a Web-accessible relational database management system in a distributed environment. Any user-defined query to the Web becomes searchable across all agencies and their respective databases.

It is important to dispel most concerns about privacy or confidentiality disclosure associated with Web searchable metadata. The metadata simply describe, in a structured and standardized way, those elements common to all data holdings. Perhaps imagine it as a card catalogue, bibliography and abbreviated technical manual, combined. In its most basic format, geospatial metadata informs the user if the resource contains geographic data. It specifies if the resource is a dataset, the organization responsible for the study or dataset, the title of the resource, its purpose, an abstract describing the dataset, boundary information, and data access and data use constraints. It even provides an agency contact to help serve user needs for added information or special inquiries of the data provider.

The **option** to put raw data along with the metadata on the Web is another way of making geospatial data accessible to the public. There are many HHS geospatial datasets that are posted by agencies on their respective websites. For example, mortality statistics from the National Center for Health Statistics (NCHS) form the basis for interactive online mortality tables and atlases produced by NIH and CDC. The actual data associated with the tabular and graphic information, as well, can be downloaded for other uses. Agencies are required to rigorously screen all geospatial data posted to the Web to protect against any possible identification of an individual or household.

PUBLIC HEALTH GIS NEWS AND INFORMATION

May 2004 (No. 58)

21

The process for populating the FGDC Clearinghouse with HHS searchable geospatial resources is under study and recommendation. Readers can view existing HHS geospatial material from which the Clearinghouse will be populated. These include HHS's Directory of Data Resources at <http://www.aspe.hhs.gov/datacnci/datadir/index.shtml> and the catalog of websites for HHS Data Council's Gateway to Data and Statistics at <http://www.hhs-stat.net/index.asp>.

FIRST PRESENTATION (APPENDIX) THIS EDITION)

2004 Invitation on Mapping Health Inequalities

I hope you will find the first presentation of maps received on mapping health inequalities useful to your GIS and public health work. In the last edition of *Public Health GIS News and Information*, I issued an invitation for GIS maps on the important theme of health inequalities. **The invitation remains open to all.** These current maps address key public health issues of low weight, premature and teen births, and pediatric asthma hospitalization. I'll leave interpretation of these spatial patterns to you, the reader. I do feel these maps are revealing of the inordinate public health burden placed upon our African American population, especially in terms of maternal and child health in these (and surely other similar) urban areas.

Special appreciation is extended to lead authors **Ms. Terry Lenahan**, Research Associate, The Center for Community Solutions, a private, non-profit group that provides the Greater Cleveland community with action-oriented research, policy analysis, advocacy, program planning, and communication to improve targeted health and social conditions in Northeast Ohio, and **Henry J Carretta**, Research Associate, Department of Health Administration, Virginia Commonwealth University, Richmond, VA. [Contacts: Terry at tlenahan@communitysolutions.com and Henry at hjcarret@mail2.vcu.edu]



Charles M. Croner, PhD, Geographer and Survey Statistician, and Editor, *Public Health GIS News and Information*, Office of Research and Methodology, National Center for Health Statistics, and DHHS Representative, Federal Geographic Data Committee, at cmc2@cdc.gov. Celebrating our **58th** edition with continuous reporting since **1994**.

The NCHS GIS home page contains current GIS events, archived GIS reports and other GIS links

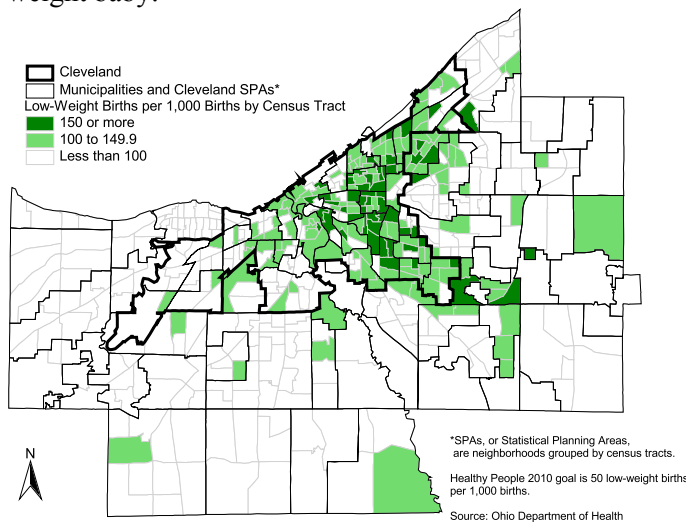
<http://www.cdc.gov/nchs/gis.htm>

APPENDIX: MAPPING HEALTH INEQUALITIES

Low-Weight Births by Maternal Race

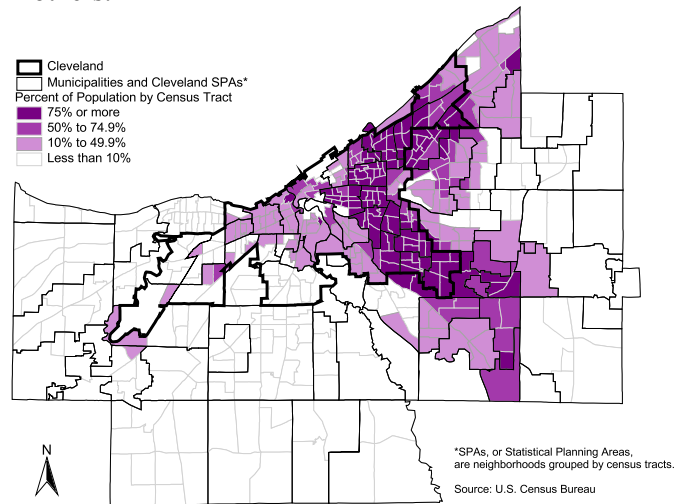
1996 to 2001 ... Terry Lenahan, The Center for Community Services

Infants born at low birth weight (less than 2,500 grams or 5.5 pounds) have a higher risk of death as well as long-term disability and impaired development. Low birth weight infants are more likely than heavier infants to have motor and social disorders including learning disabilities and behavioral problems. Some research has shown that maternal health behavior such as smoking, alcohol use, caffeine consumption, and lack of prenatal care is associated with low-weight births. Additionally, teen mothers and those of low socioeconomic status are at an increased risk of having a low birth weight baby.



In Cuyahoga County (map above), less than 7 percent of White mothers had low birth weight babies, but the rate was double among African Americans--13.6 percent of infants were born weighing too little. In Cleveland, low birth weight was most prevalent among African-American mothers--14.1 percent of infants were born too small compared to 8.3 percent of infants born to White mothers, a difference of almost 70 percent.

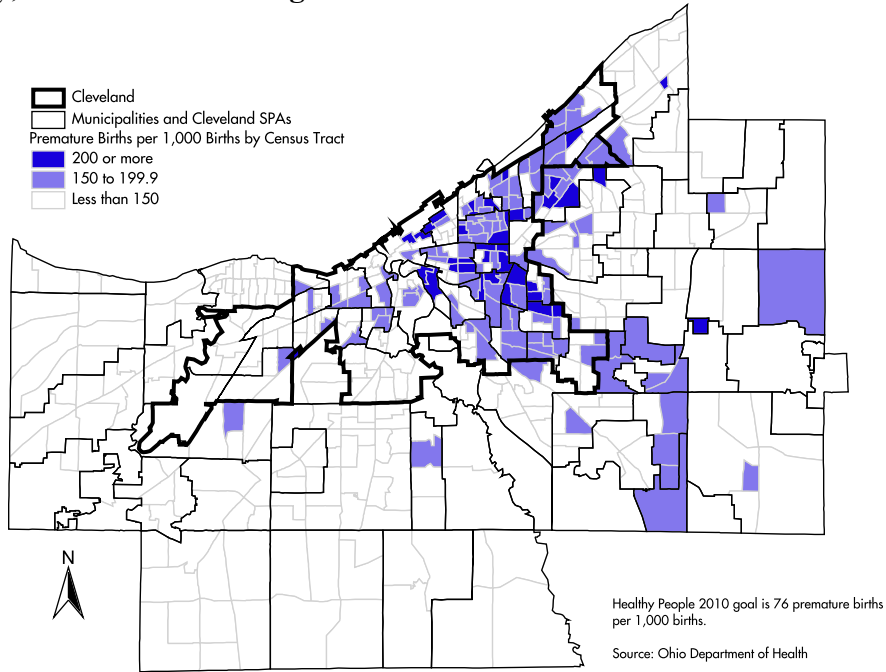
Healthy People 2010, the prevention agenda for the nation, has the goal of reducing the percent of low birth weight infants to 5.0 percent by 2010. Low birth weight infants are nearly twice as common among African-American mothers--13 percent of all infants were low birth weight compared to 6.6 percent among White mothers.



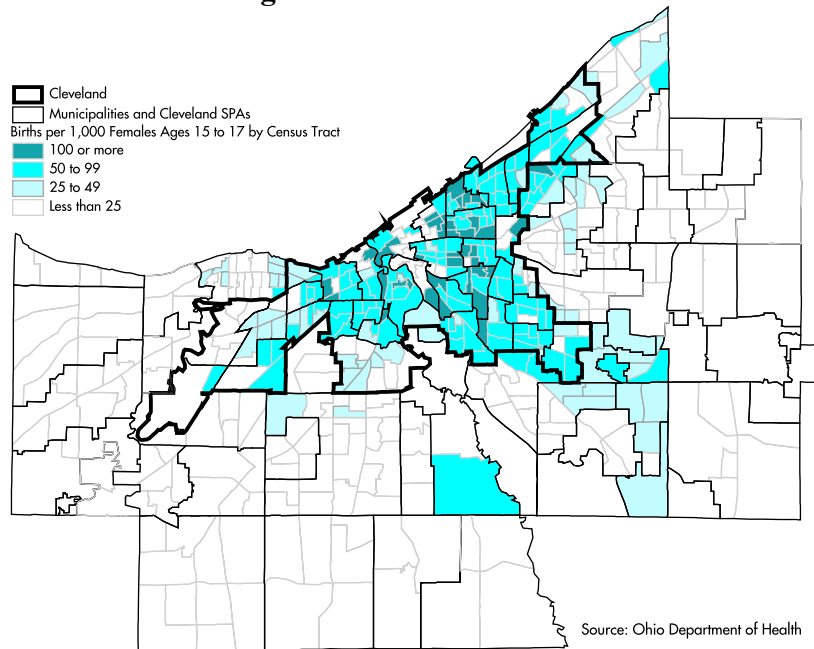
The African American population in Cleveland, Ohio has remained relatively constant during the last 50 years, at about a quarter of a million persons. But with the loss of White population, which largely migrated to the Cuyahoga County suburbs and surrounding counties, the African American population increased from 16 percent of Cleveland's total population in 1950 to 50.7 percent in 2000. Eight east-side Cleveland SPAs (Statistical Planning Areas, or neighborhoods grouped by census tracts) are over 95 percent African American. Please see map (upper right) of percent African American in Cuyahoga County, 2000.

Maps here and on following page created by lead author Ms. Terry Lenahan, Policy and Planning Associate in Research, The Center for Community Solutions. Low-weight birth rates calculated by Lucy Malakar. Data geocoded to census tract level by Brian McNamara and programming for the birth rate data by Ellen Cyran, Cleveland State University. The low-weight birth analysis and map is one of 37 indicators in the Center's Social Indicators 2003: Community Health report, published December 2003.

Premature Birth Rate Cuyahoga County, 1996 to 2001 Average



Teen Birth Rate Cuyahoga County, 1996 to 2001 Average

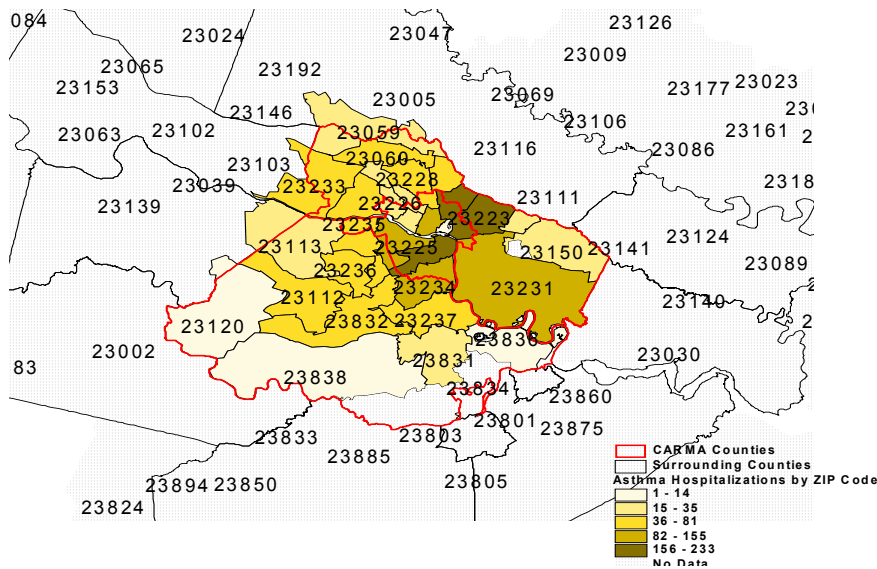


A Community-Based Program to Prevent Hospitalization of Children with Asthma

Henry Carretta, MPH, Adrienne E. S. Keller, PhD, Elizabeth L. McGarvey, EdD
Virginia Commonwealth University

Asthma hospitalization rates are highest among children under 13 years of age with children under 5 typically having the highest rates. Minorities and the poor bear a disproportionate share of asthma prevalence and higher rates of hospitalization. For example, hospitalization rates for African Americans are almost three times higher than for Whites. Asthma hospitalizations are generally preventable with access to appropriate medical care and patient self-management skills. Reducing asthma hospitalizations from 60.9 to 25 per 10,000 in children under 5 is a Healthy People 2010 national objective. Hospitalization rates in 2000 for children under five for three counties/cities in the Richmond Virginia Metropolitan area ranged from 51 to 112 per 10,000. A community-based asthma prevention and control program called Controlling Asthma in the Richmond Metropolitan Area (CARMA) was developed by partners in a community asthma coalition with funding from the Centers for Disease Control and Prevention. The target population is children (0-17) with asthma in the Richmond Metropolitan Area, with special focus on children with severe and/or poorly controlled asthma who are on Medicaid or have no health insurance coverage.

Pediatric Asthma Hospitalizations in the Richmond Metropolitan Area 2000-2002



Because of the higher prevalence among minorities and the poor, hospitalized asthma patients are often from geographically clustered areas following decades of residential segregation along racial, income, and social class lines. Hospitalizations reported by county or other large areas may obscure this clustering of asthma hospitalizations and the socio-demographic characteristics of the smaller areas.

Asthma hospitalization data obtained from Medstat¹ for the CARMA catchment area were plotted by race and ZIP Code using ArcView 3.1. Asthma hospitalizations were defined as a primary diagnosis of ICD-9-CM 493.0 to 493.9. The hospitalization counts include multiple hospitalizations by the same child. Tracking individuals over time was not possible with this data but analysis from other sources suggests that 10-15% of children hospitalized for asthma in this area have more than one hospitalization per year. The highest number of hospitalizations was seen in 3 ZIP Codes (23222, 23223, & 23224) that cut a swath through the center of Richmond and into the adjacent counties of Henrico and Chesterfield. Ninety-three percent of the hospitalizations in these ZIP Codes were for African Americans reflecting the fact that the populations are 75-89% African American. These ZIP Codes have substantially lower median income,

PUBLIC HEALTH GIS NEWS AND INFORMATION

May 2004 (No. 58)

25

lower proportions of high school graduates, and higher proportions of poverty, the uninsured, and Medicaid enrollment than any of the three counties as a whole. Four ZIP Codes in the 2nd highest tier were approximately equal in their proportion of African American and White population although African Americans represented a disproportionate share of the hospitalizations (>80%). Eight ZIP Codes in the 3rd tier (36-81) were predominantly White and in those ZIP Codes the hospitalizations were predominately for White children. This confirmed the need to target interventions to schools, Head Start programs, and providers in those ZIP Codes with the highest minority populations.

[1 Medstat is a healthcare information company. Source data was extracted by Medstat from Virginia Health Information: <http://www.vhi.org>]