

PUBLIC HEALTH GIS NEWS AND INFORMATION

September 2001 (No. 42)

Dedicated to CDC/ATSDR scientific excellence and advancement in disease control and prevention using GIS



Selected Contents: Events Calendar (pp.1-2); (pp.7-8); Public Health and GIS Literature (19); Website(s) of Interest (pp.19-20); Final

News from GIS Users (pp.2-7); GIS Outreach (pp.8-16); DHHS and Federal Update (pp.16-20); Thought (p.20);

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

(1) **SEPTEMBER 13, 2001.** “**Multiscale Advanced Raster Map Analysis System Definition, Design and Development,**” by **Ganapati P. Patil**, Distinguished Professor of Mathematical Statistics; Director, Center for Statistical Ecology and Environmental Statistics. This Office of Research and Methodology (ORM) seminar will be held from 10-11:30 A.M. at the NCHS Auditorium; and (2) **OCTOBER 17, 2001.** “**Combining Statistical and Spatial Analyses to Characterize Tuberculosis Incidence in Northern Virginia,**” by **Donald T. Gantz**, Ph.D., Professor of Statistics, Department of Applied & Engineering Statistics, George Mason University; **Lathan S. Dennis**, M Sc., GIS Analyst, Fairfax County Human Services; and **Linda Drga**, MPH, RN, Tuberculosis Coordinator, Fairfax County Health Department. This **NCHS Cartography and GIS Guest Lecture Series** program will be held from 2:00-3:30 P.M. at the NCHS Auditorium, RM1100, Hyattsville, MD; Envision is available to offsite CDC/ATSDR locations; Web access for October 17 only is available at <http://video.cdc.gov/ramgen/envision/live.rm>. [See abstracts for both presentations this edition. Note: 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). All NCHS Cartography and GIS presentations are open to the public. Contact: Editor, *Public Health GIS News and Information*]

[Note: Calendar events are posted as received; for a more complete listing see prior two bimonthly reports at NCHS GIS website]

• First Annual Caribbean Conference, sponsored by

the Urban and Regional Information Systems Association (URISA), September 9-12, 2001, Montego Bay, Jamaica [See website: <http://www.urisa.org/2001aribbean/caribbeanprelim.htm>]

• 6th International Conference on GeoComputation, September 24-26, 2001, Brisbane, Australia [See: <http://www.geosp.uq.edu.au/gc2001>]

• Fifth International Airborne Remote Sensing Conference and Exhibition, September 17-20, 2001, San Francisco CA [See: <http://www.irim-int.com>]

• 8th International Symposium on Remote Sensing, September 17-21, 2001, Toulouse, France [See: <http://spie.org/Conferences/Programs/01/rs>]

• GIS 2001 and AGI Conference, September 18-20, 2001, London, England [See: <http://www.iebusiness-forums.com/gis>]

• From 2D to 3D: Establishment and Maintenance of National Core Geospatial Databases, October 8-10, 2001, Hannover, Germany [See: <http://www.ipi.uni-hannover.de/isprs-wg2-4/oeepe-isprs-2001.html>]

• Annual Conference of the Association of Public Data Users, “Democratization of Data: Impact on Access, Producers, Disseminators, and Users,” October 15-17, 2001 Arlington, Va [See: www.apdu.org]

• Healthcare in Asia: New Technologies, New Options, The U.S. Trade and Development Agency, October 17-19, 2001, Bangkok, Thailand [See: <http://www.trademeetings.com>]

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☛ Measuring the Earth—Digital Elevation Technologies and Applications, ASPRS (The Imaging and Geospatial Information Society) and the Management Association for Private Photogrammetric Surveyors (MAPPS), October 31–November 2, 2001, St. Petersburg, FL [See: <http://www.asprs.org>]

☛ The Ninth ACM International Symposium on Advances in Geographic Information Systems, November 9–10, 2001, Atlanta, GA [See site: http://outlook.cs.purdue.edu/ACM_GIS2001]

☛ 16th Annual Meeting of the National Association of Health Data Organizations (NAHDO), "Health Information Initiatives 2001: The Roadmap to the Future," December 3–4, 2001, Washington, D.C. [See: <http://www.nahdo.org/meetings.htm>]

☛ 2001 International Conference on Health Policy Research (ICHPR): "Methodological Issues in Health Services and Outcomes Research," December 7–9, 2001, Boston, MA [See site: <http://dcc2.bumc.bu.edu/chqoer/hpss/hpss4.htm>]

II. GIS News

(Please communicate directly with colleagues referenced below on any items; please 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 or ATSDR)

A. General News and Training Opportunities

1. From **William C. Hoffman**, Public Health Research Laboratories, Oroville, CA: Public Health Research Laboratories (PHRL) presents an advanced GIS and spatial modeling course, "**Using GIS, Spatial Statistics, and Predictive Modeling for Health Research**," December 3–14, 2001, at the University of California Berkeley. This training course is designed to give researchers an understanding of the use of GIS for the prevention and control of disease. Principles of medical geography, spatial epidemiology, spatial analysis, spatial statistics, and GIS methods taught in this course may be applied to a variety of health problems. For more information on the course please visit site <http://www.phrl.org/Special%20Training%20TBA.htm>. [Contact: Bill at whoffman@phrl.org]

2. From **Lauri Velotta**, National Institute of Justice: The Crime Mapping Research Center (CMRC), National Institute of Justice (NIJ) requests proposals to conduct research that utilizes and/or develops **leading-edge spatial analytic methods**. This first solicitation for spatial data analysis may be reviewed at <http://www.ojp.usdoj.gov/nij/funding.htm>. A wide variety of research topics are anticipated that explore the use of spatial data analysis for criminal justice research and practice. Established in 1997, the goal of the CMRC is the promotion, research, evaluation, development, and dissemination of GIS (geographic information systems) technology and the spatial analysis of crime. Toward that goal, approximately \$300,000 is being made available for this solicitation to support between five and seven awards. Supported projects are to be conducted within one year. The Due Date for proposals is September 17, 2001. [Contact: Lauri at velottal@ojp.usdoj.gov]

3. From **Elizabeth Groff**, National Institute of Justice: If you are interested in training that you can complete at your desk, please check out the CrimeMap Tutorial, a distance learning tool developed by Wil Gorr, Carnegie Mellon University. There are both ArcView and MapInfo versions available on the Crime Mapping Research Center (CMRC) website at <http://www.ojp.usdoj.gov/cmrc/training/welcome.html>. This tutorial enables students to learn crime mapping from their desktop or laptop computers at home or at work, and is designed for self-paced instruction. The purpose of the tutorial is to provide police with the skills and knowledge to produce the day-to-day crime maps that have been proven to help reduce crime. There are three parts: 1) using a crime mapping GIS, 2) geocoding police data, and 3) building area and pin maps. The tutorial was beta tested at the 1999 Crime Mapping Research Center's Annual Conference. [Contact: Elizabeth at groffe@ojp.usdoj.gov]

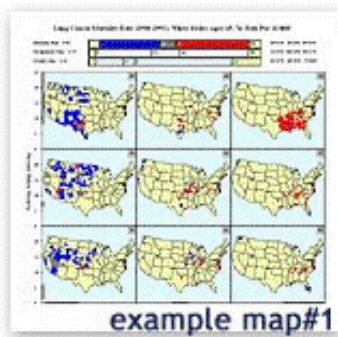
4. From **Alan MacEachren**, GeoVISTA Center, The Pennsylvania State University: Mark Harrower, GeoVISTA Center has prepared and posted a new

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featured project description. It covers some parallel developments by sub-components of our project dealing with extending **Conditioned Choropleth (CC) Maps** from Dan Carr's (George Mason University) original implementation for print to a dynamic tools for web display and interaction. CC maps address the problem of visually representing the geographic aspects of multivariate relationships. They do so by extending the concept of small multiples from depiction of multiple related variables separately (on individual maps) to the representation of subcomponents of multivariate relationships (with a portion of the relationship among three variables shown on each map). In example map #1, the conditioned maps have shown that areas with high rainfall and high poverty ALSO have higher-than-average lung cancer rates. There is a correlation between these three variables. What is really interesting is that this statistical correlation also has a geographic correlation: these places form a regional "blob" in only one portion of the country (the 'red' areas in the south-central US). Using tools like conditioned choropleth maps, analysts can visually explore three datasets simultaneously looking for interesting spatial patterns and co-occurrences. You can check it out at <http://www.geovista.psu.edu/grants/dg-qg/feature.html>. We are interested in any initial reactions to the two designs and will incorporate your reactions in the next versions, if we can. [Contact: Alan at alan@geog.psu.edu]



with high rainfall and high poverty ALSO have higher-than-average lung cancer rates. There is a correlation between these three variables. What is really interesting is that this statistical correlation also has a geographic correlation: these places form a regional "blob" in only one portion of the country (the 'red' areas in the south-central US). Using tools like conditioned choropleth maps, analysts can visually explore three datasets simultaneously looking for interesting spatial patterns and co-occurrences. You can check it out at <http://www.geovista.psu.edu/grants/dg-qg/feature.html>. We are interested in any initial reactions to the two designs and will incorporate your reactions in the next versions, if we can. [Contact: Alan at alan@geog.psu.edu]

B. Department of Health and Human Services

Agency for Healthcare Research and Quality

5. From: **Robert L. Phillips, Jr.**, Robert Graham Center for Policy Studies in Family Practice and Primary Care, Washington, D.C.: The North American Primary Care Research Group (NAPCRG) is working with DHHS Agency for Healthcare Research and

Quality to plan a preconference forum on the use of GIS in primary care. The meeting, "Using Geographic Information Systems (GIS) to Provide an Evidence-based Perspective of Primary Care," will take place just prior to the NAPCRG meeting on Oct 13 in Nova Scotia, Canada (See website www.napcrg.org). We are assembling a panel of international researchers who use GIS for assessing aspects of primary care. We will also be discussing the development of an online primary care atlas (potentially with the collaboration of AHRQ or NCHS) that would facilitate the application of GIS to primary care data. [Contact: Bob at BPhillips@aafp.org]

Agency for Toxic Substances and Disease Registry

6. The Summer 2001 edition, vol. 11, no. 2, of *Hazardous Substances & Public Health* (see www.atsdr.cdc.gov/HEC/hsphhome.html) is devoted to **polychlorinated biphenyls (PCBs)**, a group of manufactured organic chemicals containing 209 congeners or individual chlorinated chemicals. They were banned in the U.S. in 1977. This edition includes information on PCB case studies; the revised *Toxicological Profile for Polychlorinated Biphenyls*; the Pediatric Environmental Health Specialty Unit program and two reports of PCB monitoring at Anniston, Alabama and Rome, Georgia; the Great Lakes Human Health Effects Research Program; and Health Effects of PCBs. There also are listings of environmental and public health web resources. The next edition will focus on asbestos.

7. From **Henry Falk**, Assistant Administrator, ATSDR: The Environmental Protection Agency (EPA) arsenic drinking water standard of 0.01 ppm (10 ppb) reported in the Agency for Toxic Substances and Disease Registry (ATSDR) February 2001 Arsenic ToxFAQs was based on the EPA final rule for arsenic in drinking water, published on January 22, 2001, in the *Federal Register*. However, the EPA is currently reviewing the science and cost estimate supporting this rule, and, in the interim, has reverted to the previous standard for arsenic. Thus, the current EPA arsenic drinking water standard remains at 0.05 ppm (50 ppb).

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[Source: July 12, 2001 memorandum]

Centers for Disease Control and Prevention

8. Innovations in Public Health Practice Lecture Series, Sponsored by the Public Health Practice Program Office PHPPPO): **“Local Public Health Competency for Emergency Response,”** September 14, 2001, from 9-10:30AM, Koger Williams Building, Atlanta, Room 1802 & 1805. The purpose of this research is to demonstrate a model approach that can be used to identify essential public health service competencies needed in any single program area. The example used is public health emergencies, including Bioterrorism. The project involves two major aims: identification of competencies and evaluation of the competencies with representatives of public health agencies. [Contact: Dotty Jenn at Djenn@cdc.gov]

National Institutes of Health

9. From **Ron Abeles**, Office of Behavioral and Social Sciences Research (Behavioral and Social Sciences Research at NIH, June 26, 2001): During the Appropriations hearing of the House Subcommittee on Labor, HHS, Education, and Related Agencies held on May 16, 2001, Congressman Patrick Kennedy asked Dr. Ruth Kirschstein, Acting Director of the National Institutes of Health (NIH), for a consolidated report of ongoing behavioral and social sciences research at the NIH. The Report is available for reading and downloading at <http://obsr.od.nih.gov/Publications/NIHBSSR2001.pdf>. The NIH Office of Behavioral and Social Sciences Research (OBSSR) prepared the report in response to this request. This report updates an earlier document, Description of Behavioral and Social Sciences Research (<http://obsr.od.nih.gov/Publications/Senate.pdf>) which was submitted in June 2000 in response to the request in Senate Report No. 106-166. We have provided in the Background section the detailed definition of Behavioral and Social Sciences Research that was developed by OBSSR in 1996. Since behavioral and social sciences research is a large, multifaceted field, encompassing a wide array of disciplines, the definition is divided between Core Areas of Research and Adjunct Areas of Research. Core areas of research are further divided into

basic/fundamental research and clinical research. The Report provides the up-to-date status of behavioral and social science research at each of the NIH Institutes and Centers. [Contact: Georgeanne Patmios at email patmiosg@od.nih.gov]

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

10. The **18th Annual HBCU GIS Summer Faculty Workshop** was held July 16-21, 2001, at host locations (1) National Capital Planning Commission (NCP), Washington, D.C. and (2) Howard University Continuing Education Urban Environment Institute, Silver Spring, MD. The remote sensing field exercise was conducted at the Washington Mall, Washington, D.C. and, thanks to field instructor Lee De cola, USGS, each student was presented with his and her own GPS receiver. Pamela Bingham was workshop coordinator with assistance from Gloria Thurman.

The theme of this year’s workshop was **“GIS for a Changing World.”** Some of the key events included: Introduction to ArcView (two day course), Walt Rennick, ESRI; Remote Sensing/Satellite Data Workshops, ESRI and NASA, Jeff Masek; Remote Sensing Field Exercise, Lee DeCola, USGS; Introduction to the WGIS Consortium (Washington GIS Consortium), Connie Harshaw, NCP; Internet Resources for GIS Educator, Doug Caldwell, Army Corps of Engineers TEC; 3D Visualization, Mike Sherman, WGIS; Environmental Permitting and GIS, Kyle Bohnenstiehl, Office of Surface Mining (OSM); Public health and GIS, Lee De Cola; Land Use and GIS, Leonard Gore, Bureau of Land Management (BLM); Emergency Response and GIS, Leslie Weiner-Leandro, Federal Emergency Management Agency (FEMA); Census and GIS, Juanita Gaston, Florida A&M University; Public Health and GIS, Paul Robinson, Senait Teklehaimanot, Charles Drew College of Medicine; Redistricting and GIS, Rudolph Wilson, Norfolk State University; Urban Redevelopment and GIS, David Padgett, Tennessee State University; Remote Sensing, Raul Campos, EnerQuest Systems LLC, New Mexico; Public Works Projects and GIS, Emmanuel Onwukwe, District Government Public Works; and GIS Project panelists

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(1) HBCUs- David Padgett, from Tennessee State University, Eric Rahmian, Alabama A&M University, Shoba Sriharan, Virginia State University, and Nat Woodrick, Howard University and (2) Private Sector- Raul Campos, Emmanuel Onwukwe, and Milton Chambliss, MS Space Commercialization Initiative.

The annual workshop welcomes sponsorships from all sectors. Primary sponsors this year included the Bureau of Land Management, U.S. Geological Survey, U.S. Army Corps of Engineers-Engineer Research and Development Center-Topographic Engineering Center, ESRI, and the Washington GIS Consortium at the National Capital Planning Commission. [Contact: Gloria Thurman at gthurman@howard.edu or Mike Sherman, WGIS Program Manager and Director of the Office of Technology and Application Support, NCPC, at michael.sherman@ncpc.gov]

11. From **Paula Skedsvold**, National Institutes of Health: The Office of Behavioral and Social Sciences Research (OBSSR) at the National Institutes of Health (NIH) seeks your help in building a cadre of minority scientists in the behavioral and social sciences. OBSSR is interested in linking NIH-funded investigators (mentors) with minority students, post-docs, and junior faculty members. If you are a current principal investigator of an NIH grant and are interested in being a mentor, or if you are a minority student, post-doc, or junior faculty member interested in furthering your research skills, please visit our interactive website at website <http://www4.od.nih.gov/research>.

12. **MMWR Weekly Report**, Volume 50 , No. 34: Impact of Targeted, School-Based Dental Sealant Programs in Reducing Racial and Economic Disparities in Sealant Prevalence Among Schoolchildren-Ohio, 1998-1999 at <http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5034a2.htm>.

D. Other Related Agency or Business GIS News

13. From **Richard Greene**, ESRI: A new online instructional course on using GIS for health applications, by Zvia Segal Naphtali, New York

University, is now available at <http://campus.esri.com>. Mapping for Health Care Professionals using ArcView GIS, shows how health care researchers and other professionals can use GIS to study epidemiology and the adequacy of health care resources. The course focuses on teaching students how to integrate health care data with geospatial data to analyze disease distribution, demographic variables related to health indicators, and the locations of health care providers. Students taking the course will work with real health data and use GIS tools for thematic mapping, proximity analysis, geocoding, and geoprocessing. [Editor: The course cost is \$80]

14. From **Wendy Francis**, URISA: The First Annual Caribbean Conference, sponsored by the Urban and Regional Information Systems Association (URISA) will be held September 9-12, 2001 in Montego Bay, Jamaica. You are invited to take advantage of an abundance of timely presentations, including those in the GIS in Public Health Program Track. Keynote Speakers, Jacqueline daCosta (Director General of Jamaica's Ministry of Land and Environment) and Jack Dangermond (President of ESRI) will address the conference. [For more information, visit website <http://www.urisa.org/2001Caribbean/caribbeanprelim.htm> or contact Wendy at wfrancis@urisa.org]

15. From **Kevin Armstrong**, Washington/Baltimore High Intensity Drug Trafficking Area (W/B HIDTA): The census bureau TIGER data is available in ArcView format (**shapefiles**) on ESRI's website (<http://www.esri.com/data/online/index.html>) for every county in the United States. This data is **FREE to download**, all you have to do is enter a name and e-mail address. Geocodeable street centerlines are included in these data sets. ALL the data is in geographic (lat long) coordinates and this is documented with every file you download. The data from ArcData Online is 1995 street address ranges (I believe) and if you use ESRI's geography network, you can download 1999 address ranges (also for free, just use same login as ArcData Online site). The data from geography network (www.geographynetwork.com) is also in geographic coordinates (NAD83). If you are

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using MapInfo, you can use the universal translator to convert these shapefiles into TAB files. If your projection doesn't match, you can save a copy of the table into your preferred projection. If you are using ArcView and you would like a different projection, use the projection utility extension. Just remember the Census data you download is in geographic coordinates. All you need to know is the coordinate system of your existing data which is most likely not geographic. I think it is important that everyone know this data is available for FREE on ESRI's website. The intended scale of the data is roughly 1:63360 and this is also documented in every file you download. County boundaries, rivers, water polygons, census demographics (1990), urban/rural areas, and many more data are available. [Contact: Kevin at karmstro@wb.hidta.org]

16. From **Jay Devasundaram**, GIS Analyst: I write to inform your audience in the newsletter about a potentially useful tool for simple display of geographic information. Here is an application I built, as a demo, displaying some of the information from a field program in leprosy control, in India, that I worked on at site <http://www.epigeographics.com/test/jmaplet/karigiri.shtml>. When you click on any of the circled spots, specific html pages open up, displaying information regarding that spot - In addition, there is an alphabetized list from which one could choose unfamiliar areas, as in this demo. The demo has similar pages for almost all the spots which feature survey results for leprosy among the indicated population for 1994, but it is possible to have site specific information show up. This application has been used for diverse programs such as crime grid information, tourism, and anatomy. It is based on a freeware java applet from the University of Florida-<http://www.ifas.ufl.edu/www/jmaplet>. [Contact: Jay at epijay@hotmail.com]

17. Space Imaging announced the first major photogrammetric software companies that will incorporate the ability to **orthorectify** IKONOS satellite imagery into their software suites. Users of ERDAS® IMAGINE OrthoBASE(tm), Z/I Imaging's

ImageStation OrthoPro(tm), or PCI Geomatics' Geomatica(tm) OrthoEngine® soon will all be able to orthorectify IKONOS satellite imagery with Space Imaging's newest product, Geo Ortho Kit. Geo Ortho Kit consists of a high-resolution Geo image derived from the IKONOS satellite and an Image Geometry Model (IGM) digital file. The IGM is a mathematical way of expressing the complex sensor geometry of the IKONOS camera, which is necessary to correct the imagery for terrain distortions. By incorporating the IGM and a Geo image into the leading commercial imagery software suites, users will now be able to create an accurate ortho image by using their own **digital elevation models (DEMs)** and ground control points (GCPs). Since IGM provides the complete and accurate sensor geometry, the metric accuracy of the final orthorectified image is limited only by the accuracy of the DEM and GCPs. The product is available as a part of the Geo product suite in 1-meter black-and-white, 1-meter color, or 4-meter multispectral. The company (see site <http://www.spaceimaging.com>) launched the world's first and only one-meter resolution, commercial Earth imaging satellite, IKONOS, on Sept. 24, 1999. Other products are produced from the Indian Remote Sensing satellites, Canada's RADARSAT and the European Space Agency's ERS satellites.

This one-meter [example shown here] resolution image of the CBS Survivor: Africa contestant tribal camp was taken by Space Imaging's

IKONOS satellite on Aug. 13, 2001. According to the Web site Survivor Maps, tribal camp, located in the Shaba National Reserve in central Kenya, shows a tribal Maasai-style village of 10



thatched huts with a circular thornbush fence. IKONOS travels 423 miles above the Earth's surface

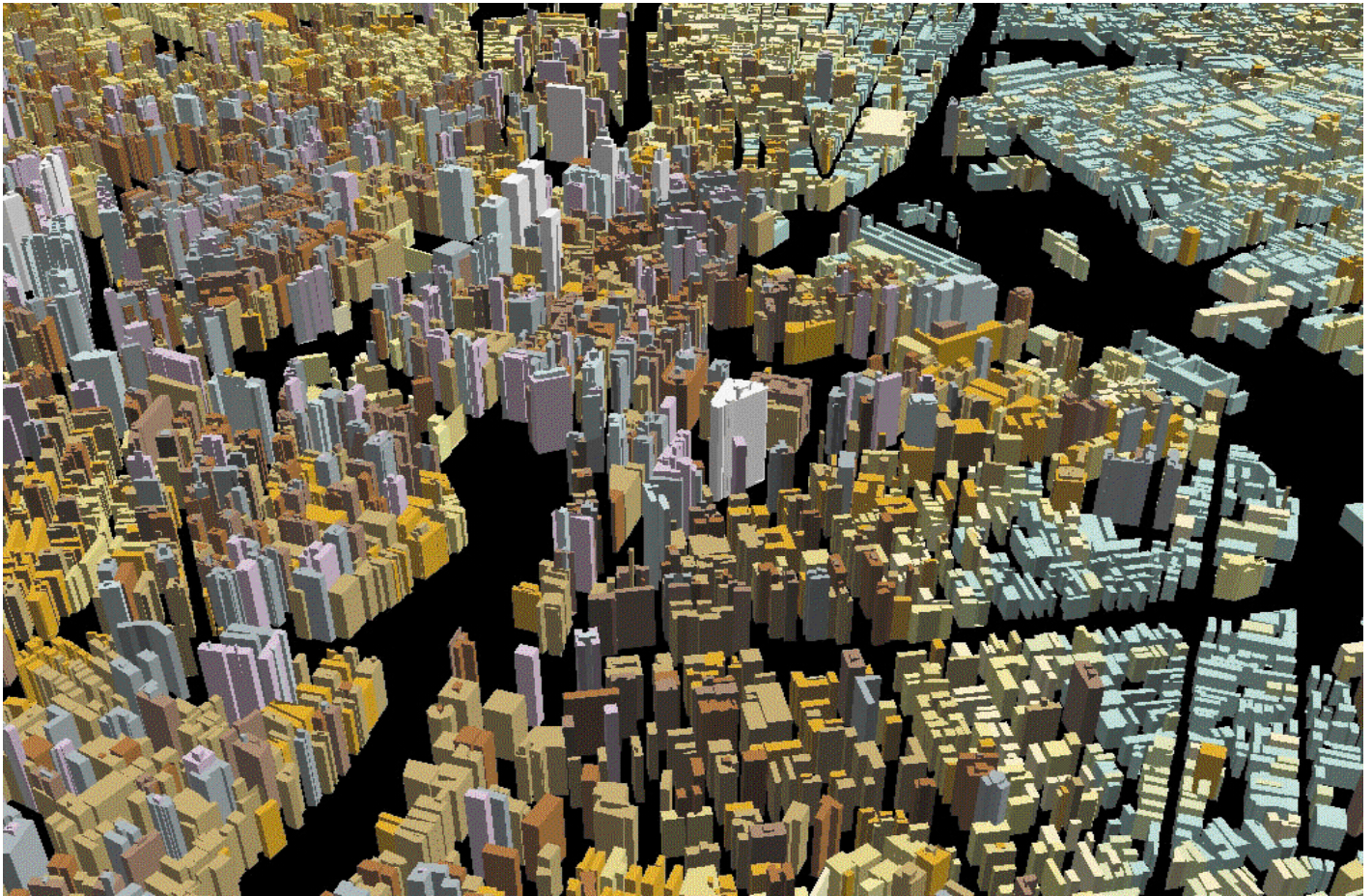
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at a speed of 17,500 miles per hour. The 1600-pound satellite was launched in Sept. 1999 and is owned and operated by Space Imaging in Denver, CO.

18. From **Lynn Davis**, Vexcel Corporation: Vexcel Corporation uses advanced photogrammetric techniques to produce high-end 3Dimensional data sets. City models, such as the one seen here, use stereo aerial photography and GPS surveyed ground control points as source data. Production methods utilize manual and automated procedures, and include Vexcel's proprietary technology and commercially available products. Some of the final products are 3D building vectors, ortho photos, and DEM's, all of which are high resolution, accurate to less than



a meter, and aesthetically pleasing. [Contact: Lynn at davis@vexcel.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: **Mary Alice Gillispie**, Fargo Cass Public Health, ND: I am a subscriber to *Public Health GIS News and Information* but have not seen anything on a topic that would be helpful in understanding something that has occurred in our community. In

April we received notice that there was a local college student admitted to the hospital with multiple cavitory tuberculosis and that his sputum was "loaded" with bacilli. He had been symptomatic for more than six months and lived in a dormitory on campus. Since we live in a cold climate and this had been a particularly cold winter, the dormitory had basically been closed up except for whatever air exchange the physical plant

had set as part of the heating system. I am still trying to get detailed information but it appears that the amount of outside air in the building was fairly low in order to avoid the very high heating costs of bringing it up to room temperature. We have carried out a first round of tuberculosis testing and will be doing the necessary second testing in a few weeks. Over one thousand students and staff have been involved. The CDC has been involved in this situation. As we begin to see patterns of who has a positive test and where they live in relation to the index case as well as how air is handled in the building it appears that a GIS approach to understand the level of transmission might be helpful. There is apparently a type of GIS software called facilities management software that helps building designers. Do you know if it has ever been used in a situation like this? Or perhaps in a hospital outbreak of any type? Do you know if there is anyone at the CDC who may have some suggestions? Thanks for any help. [Contact: Mary Alice is MD, Health Officer, at MAGillispie@ci.fargo.nd.us]

☞ From **Lois Lang**, Lang & Associates: I am currently assisting a county in California in gathering data to map available health and social services for prenatal to age 5 clients. We are mapping the location of service providers and actual clients of the services (aggregate data without names) in order to identify gaps and duplications in service. Many that I have contacted are mapping where services are (location of the public agencies and CBO's) and others are mapping the need (youth on Medicaid, parents at poverty level etc.), but I have not found any that are actually mapping addresses of clients by the service they received. Do you know of another county that is doing this? [Contact: Lois at loislang@earthlink.net]

IV. Public Health GIS

Presentations and Literature

Office of Research and Methodology (ORM)

Seminar, National Center for Health Statistics (NCHS)

SEPTEMBER 13, 2001. "Multiscale Advanced Raster Map Analysis System Definition, Design and Development," by Ganapati P. Patil, Distinguished Professor of Mathematical Statistics; Director, Center

for Statistical Ecology and Environmental Statistics; Editor-in-Chief, Environmental and Ecological Statistics, Department of Statistics, the Pennsylvania State University. **This lecture will be held at NCHS, RM1100, 10:00-11:30 A.M.** Abstract: Geospatial data form the foundation of an information-based society. The President's Committee (CENR, 1997) has indicated that geospatial information, inclusive of digital remote sensing data, has been a vastly under-utilized resource involving a multimillion-dollar investment at the national level. Even when neutralized, the credibility has been at stake, largely because of lack of tools that can assess, visualize, and communicate reliability and accuracy in real time and at desired confidence levels.

Consider a 21st Century digital government scenario of the following nature: What message does a remote sensing-derived land cover land use map have about the large landscape it represents? And at what scale and at what level of detail? Does the spatial pattern of the map reveal any societal, ecological, environmental condition of the landscape? And therefore can it be an indicator of change? How do you automate the assessment of the spatial structure and behavior of change to discover critical areas, hot spots, and their corridors? Is the map accurate? How accurate is it? How do you assess the accuracy of the map? Of the change map over time for change detection? What are the implications of the kind and amount of change and accuracy on what matters, whether climate change, carbon emission, water resources, urban sprawl, biodiversity, indicator species, or early warning? And with what confidence, even with a single map/change-map?

The presentation will discuss initial plans and formulations to answer these questions and a few more that involve multicategorical raster maps based on remote sensing and other geospatial data leading to a proposed prototype and user-friendly advanced raster map analysis system for digital governance. Cell-based raster data sets or grids are especially well suited to represent geographic phenomena. Research issues include digital image analysis, advanced raster map analysis, geospatial statistics, surface and map accuracy assessment, change detection, innovative

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sampling and observational economy, geospatial monitoring and assessment, integration of geospatial data and information, regional characterization and comparison based on multiple indicators, broader geospatial techniques and technologies, geographic information systems, etc. The presentation will have a dual disciplinary and cross-disciplinary thrust. Post presentation dialogues and discussions will be particularly welcome, leading potentially to well considered synergistic case studies. The collaborative case studies are expected to be conceptual, structural, methodological, computational, applicational, developmental, refinental, validational, and/or visualizational in their individual thrust. [Chair: Lawrence Cox, Associate Director, ORM; Contact: Joe Fred Gonzalez, Jr., ORM, NCHS, at jfg2@cdc.gov]

NCHS Cartography and GIS Guest Lecture Series

October 17, 2001. "Combining Statistical and Spatial Analyses to Characterize Tuberculosis Incidence in Northern Virginia," by **Donald T. Gantz**, Professor of Statistics, Department of Applied & Engineering Statistics, George Mason University; **Lathan S. Dennis**, GIS Analyst, Fairfax County Human Services; and **Linda Drga**, Tuberculosis Coordinator, Fairfax County Health Department. **This lecture will be held at NCHS, RM1100, from 2:00-3:30PM**, and is open to all. Abstract: The continued prevalence of Tuberculosis (TB) in the United States, particularly the incidence of multi-drug resistant strains of the disease, is a major public health concern. In Virginia, the statewide rate has been declining (down from 5.5 cases per 100,000 population in 1995 to 4.9 in 1999). However, in northern Virginia, which has over forty percent of the state's cases, the number of new active TB cases has been increasing. Fairfax County has the largest number of TB cases in northern Virginia. The high incidence of TB in northern Virginia is tied to its relatively large immigrant population within which the disease is concentrated. About 85 percent of active TB cases in the County are from persons with a country-of-origin other than the United States. Asians and Hispanics account for about

60 percent of the County's foreign-born cases. The state of Virginia maintains identifying information for all active TB cases in its Epi Info data base. Epi Info is public domain database and statistics software for public health professionals available over the Internet through the Centers for Disease Control and Prevention. Local TB controllers from across the state collect the information that populates the statewide data base. Controllers collect the information in the process of providing testing, treatment and education services to TB patients.

We have been analyzing the Epi data base in order to characterize the relationship of TB to the immigrant population. Our aim was to gain an understanding of TB patterns and relationships that would support local health departments in their management of TB control including locating facilities, assigning outreach resources and forecasting and justifying future service resource demands. We have shown that TB is concentrated within immigrant populations in particular neighborhoods and corridors. Further, these areas are associated with particular socioeconomic and demographic characteristics. The significance of various immigrant groups has fluctuated over the 12 years of information in the data base. These findings have strengthened arguments for targeted testing and have helped to clarify and articulate staffing requirements.

There is a strong spatial context associated with our data analysis and presentation of results. ArcView is the geographic information systems (GIS) tool for visualization of geocoded TB incidence data that we have linked to US Census socioeconomic and demographic data. Our effort has required teamwork between specialists in statistical and spatial analysis. We extracted data from 12 years of Epi records into the SAS System. We encountered data incompatibilities across those 12 years due to new releases of Epi together with varying data entry practices at the local level. The power of SAS facilitated merging compatible annual information and analyzing TB incidence at the neighborhood level to identify corridors with the highest TB risk. First, ArcView was used to geocode incidence data and link the observations to Census tract block groups. Then

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SAS was used to merge the TB data with US Census socioeconomic and demographic information. Through statistical and GIS analyses, we ranked Census tract block groups according to their TB rates and immigrant concentrations. The relationship between high TB rates and geographic, socioeconomic and demographic information was characterized and then visualized via GIS maps.

Our presentation will describe the interdisciplinary work of our team consisting of a County TB Coordinator, a GIS analyst and a statistician. Three distinct roles are represented: the subject area expert and practitioner, the spatial analysis expert and the data analysis expert. The interaction of the three areas of expertise led to meaningful analysis products that are proving useful in supporting policy and planning for TB control. [Chair: Charles Croner, ORM, NCHS; Contact: Don at [dgantz@gmu.edu](mailto:dgant@gnu.edu)]

Emerging Infectious Diseases

Emerging Infectious Diseases 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 online journal is located at <http://www.cdc.gov/ncidod/EID/index.htm>. The July-August 2001 supplement of CDC's journal, Emerging Infectious Diseases (EID), is now available at website <http://www.cdc.gov/ncidod/EID/upcoming.htm>. This issue contains a collection of articles on **West Nile (WN) Virus** including: West Nile (WN) Virus: A Reemerging Pathogen; Crow Deaths as a Sentinel System for WN Virus; Serologic Evidence for WN Virus in Birds in NY City; WN Virus Isolates from Mosquitoes in NY and NJ; Dead Bird Surveillance for WN Virus; WN Virus Surveillance in Connecticut in 2000; Mosquito Surveillance and Detection of WN Virus in NY; Clinical Findings of WN Virus Infection, NY and NJ; WN Encephalitis in Israel, 1999: The NY Connection, Dead Crow Densities and Human Cases of WN Virus;

Equine West Nile Encephalitis, United States; Mosquito Surveillance for WN Virus in CT, 2000; WN Virus in Birds and Mosquitoes, NY State, 2000; Epidemiology of WN Fever Outbreak, Israel, 2000; WN Outbreak in Horses in S. France, 2000; WN Virus Infection in the Golden Hamster; WN Virus Infection, Staten Island, NY, 2000; Chickens as Candidate Sentinels for WN Virus; Widespread WN Virus Activity, Eastern US, 2000; WN Virus in Overwintering *Culex* Mosquitoes, NY; WN Virus Outbreak Among Horses in NY State; Comparative WN Virus Detection in Infected Crows; and, Arboviruses and Rodent-Borne Viruses: Reevaluation of the Paradigm, American Committee on Arthropod-borne Viruses.

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 <http://www.cdc.gov/subscribe.html> and access the MMWR online at <http://www.cdc.gov/mmwr>]: Vol. **50**, No. **34**- Progress Toward Poliomyelitis Eradication-South-East Asia, January 2000-June 2001; Vol. **50**, No. **32**- Human Anthrax Associated with an Epizootic Among Livestock-North Dakota, 2000; Self-Reported Asthma Prevalence Among Adults-United States, 2000; Notice to Readers: Epidemiology in Action; *MMWR Recommendations and Reports*, Vol. **50**, No. **RR-14** *Recommendations for Using Fluoride to Prevent and Control Dental Caries in the United States* Vol. **50**, No. **31**- Temporal Variations in School-Associated Student Homicide and Suicide Events-United States, 1992-1999; Effectiveness of a Middle School Vaccination Law-California, 1999-2001; *MMWR Recommendations and Reports*, Vol. **50**, No. **30**- National, State, and Urban Area Vaccination Coverage Levels among Children Aged 19-35 Months, United States, 2000; Notice to Readers: Publication of Updated Guidelines for Evaluating Public Health Surveillance Systems; Vol. **50**, No. **RR-13** Updated Guidelines for Evaluating Public Health Surveillance Systems Recommendations from the Guidelines Working Group; Vol. **50**, No. **29**- West Nile Virus Activity-Eastern United States, 2001; Global Progress

Toward Laboratory Containment of Wild Polioviruses, June 2001; Heat-Related Deaths-Los Angeles County, California, 1999-2000, and United States, 1979-1998; Vol. 50, No. 28- Malaria Deaths Following Inappropriate Malaria Chemoprophylaxis-United States, 2001; Evaluation of a Regional Pilot Program to Prevent Mother-Infant HIV Transmission-Thailand, 1998-2000; Hantavirus Pulmonary Syndrome-Vermont, 2000; *MMWR Recommendations and Reports*, Vol.50, No. R-12 *Control and Prevention of Rubella: Evaluation and Management of Suspected Outbreaks, Rubella in Pregnant Women, and Surveillance for Congenital Rubella Syndrome*; Vol. 50, No. 27- Congenital Syphilis-United States, 2000; Notice to Readers: Delayed Influenza Vaccine Availability for 2001-02 Season and Supplemental Recommendations of the Advisory Committee on Immunization Practices; Vol. 50, No. 26- Health-Related Quality of Life-Los Angeles County, California, 1999.

Mapping Census 2000: The Geography of U.S. Diversity

Census 2000 Special Reports (CENSR/01-1)

Mapping Census 2000: The Geography of U.S. Diversity (Census Special Reports, Series CENSR/01-1) presents a synthesis of the basic patterns and changes in U.S. population distribution in the last decade. Each page features county-level detail for the 50 states, the District of Columbia, and Puerto Rico. Each page also includes a small state-level map for a simplified view of the population theme. The Census 2000 data in this report are based on the U.S. Census Bureau Redistricting (PL 94-171) Summary File. These data were released in March 2001 and were sent to each state for use in redrawing federal, state, and local legislative districts. Use of this source limits the report themes to total population, race and ethnicity, and population under age 18 (derived from the voting-age population counts in the redistricting data). Although potential topics were limited by this source, Mapping Census 2000 provides a news-filled first look at diversity and change in the population. The report presents pairs of maps on facing pages, often showing a 2000 population distribution map and a

corresponding 1990 to 2000 change in population. The report begins with general sections on the total population and overall diversity and then systematically maps data for race and Hispanic or Latino groups: Location Maps, Total Population, Diversity, White, Black or African American, American Indian and Alaska Native, Asian, Native Hawaiian and Other Pacific Islander, Two or More Races, Hispanic or Latino Origin, White, Not Hispanic or Latino Origin [see website <http://www.census.gov/population/www/cen2000/atlas.html>].

WHO/UNICEF HealthMap Near Ready

Isabelle Nuttall, MD, MPH

Communicable Disease Surveillance/HealthMap, World Health Organization. HealthMap is a joint WHO/UNICEF Programme based within the Department of Communicable Disease Surveillance and Response (see website <http://www.who.int/emc>). The Programme was initially created in 1993 to establish a Geographic Information System (GIS) to support management and monitoring of the Guinea Worm Eradication Programme. Since 1995, however, in response to the increasing demand for mapping and GIS from a much wider range of public health administrators, the scope of the work has been broadened to include the promotion and use of GIS for other disease control programmes and other public health programmes in general.

The HealthMapper is an integrated geographic database complete with data management and mapping applications tailored for public health applications. The HealthMapper combines three components including: A standardized core geographic database; A user-friendly data management; A simple mapping interface. The system is based on the same mapping engine (MapObjects 2) used for ArcView by the ESRI company. As such the system is compatible with ArcView in so far as the geographic database which is in Microsoft Access and the digital basemaps (in ArcView Shapefiles) can be taken and used separately with ArcView. This is particularly useful if further advanced analyzes are required.

The most essential part of the HealthMapper is its core geographic database. This represents the

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collection and standardization of all known existing data of individual countries relating to the following features: Digital maps of administrative boundaries (national, sub-national); Digital maps of roads, rivers, forests, elevation; Locations of villages (including village names and codes); Locations/type of health infrastructure; Location/type of school infrastructure; Location/type of safe water points; Population by administrative level, by village; and Population density raster map. The HealthMapper Database is developed in collaboration with various national ministries of each partner country.

Initially, the priority areas for the development and implementation of the HealthMapper was Africa and S.E Asia.. Consequently, the database is more established for some countries than others. Nevertheless, it is true to say that even without the village level geographic data such as villages, health facilities etc, the HealthMapper can be used to enter, visualise and map data at global, regional, national and sub-national levels down to the first and second administrative level. A full catalogues of core geographically related data available by country is available from the HealthMap team.

The Public Health Mapping team-or HealthMap-consists in a core team of 6 persons based in WHO Geneva. The HealthMap Team consists of Jean-Pierre Meert, Group Leader, HealthMap (meertj@who.int); Isabelle Nuttall, Medical Officer, HealthMap (nuttalli@who.int); Kathy O'Neill, Public Health Technical Officer HealthMap (oneillk@who.int); Flavien Ake, Systems Developer-HealthMapper (akeh@who.int); Michael Black, Systems Administrator-Global Atlas of Infectious Diseases (blackm@who.int); and Bram Piot, GIS/Data Manager (piotb@who.int).

Pilot versions of the HealthMapper have been implemented in several developing countries for different programmes (Roll Back Malaria, Onchocerciasis control, Guinea worm eradication, etc.). A robust version is expected by October 2001. [The HealthMap Team can be contacted as follows: The HealthMap Team, Integrated Disease Surveillance and Response, Department of Communicable Disease Surveillance and Response, Communicable Diseases

Cluster, World Health Organization, 1211 Geneva 27, Switzerland or visit HealthMap at <http://bbs.wpro.who.int/healthmap>]

Neighborhood of Residence and Incidence of Coronary Heart Disease, by Diez Roux AV, Merkin SS, Arnett D, Chambless L, Massing M, Nieto EJ, Sorlie P, Szklo M, Tyroler HA, Watson RL.. *New England Journal of Medicine* 2001 (July 12, 2001); 345 (2):99-106. Abstract. *Background* Where a person lives is not usually thought of as an independent predictor of his or her health, although physical and social features of places of residence may affect health and health-related behavior. *Methods* Using data from the Atherosclerosis Risk in Communities Study, we examined the relation between characteristics of neighborhoods and the incidence of coronary heart disease. Participants were 45 to 64 years of age at base line and were sampled from four study sites in the United States: Forsyth County, North Carolina; Jackson, Mississippi; the northwestern suburbs of Minneapolis; and Washington County, Maryland. As proxies for neighborhoods, we used block groups containing an average of 1000 people, as defined by the U.S. Census. We constructed a summary score for the socioeconomic environment of each neighborhood that included information about wealth and income, education, and occupation. *Results* During a median of 9.1 years of follow-up, 615 coronary events occurred in 13,009 participants. Residents of disadvantaged neighborhoods (those with lower summary scores) had a higher risk of disease than residents of advantaged neighborhoods, even after we controlled for personal income, education, and occupation. Hazard ratios for coronary heart disease among low-income persons living in the most disadvantaged neighborhoods, as compared with high-income persons in the most advantaged neighborhoods, were 3.1 among whites (95 percent confidence interval, 2.1 to 4.8) and 2.5 among blacks (95 percent confidence interval, 1.4 to 4.5). These associations remained unchanged after adjustment for established risk factors for coronary heart disease. *Conclusions* Even after controlling for personal income, education, and occupation, **we found that living in a disadvantaged neighborhood is**

associated with an increased incidence of coronary heart disease. [Address reprint requests to Dr. Diez Roux, Division of General Medicine, Columbia Presbyterian Medical Center, 622 W. 168th St., PH9 E., Rm. 105, New York, NY 10032, or email ad290@columbia.edu]

Special Report

Mapping For Resource Allocation in California

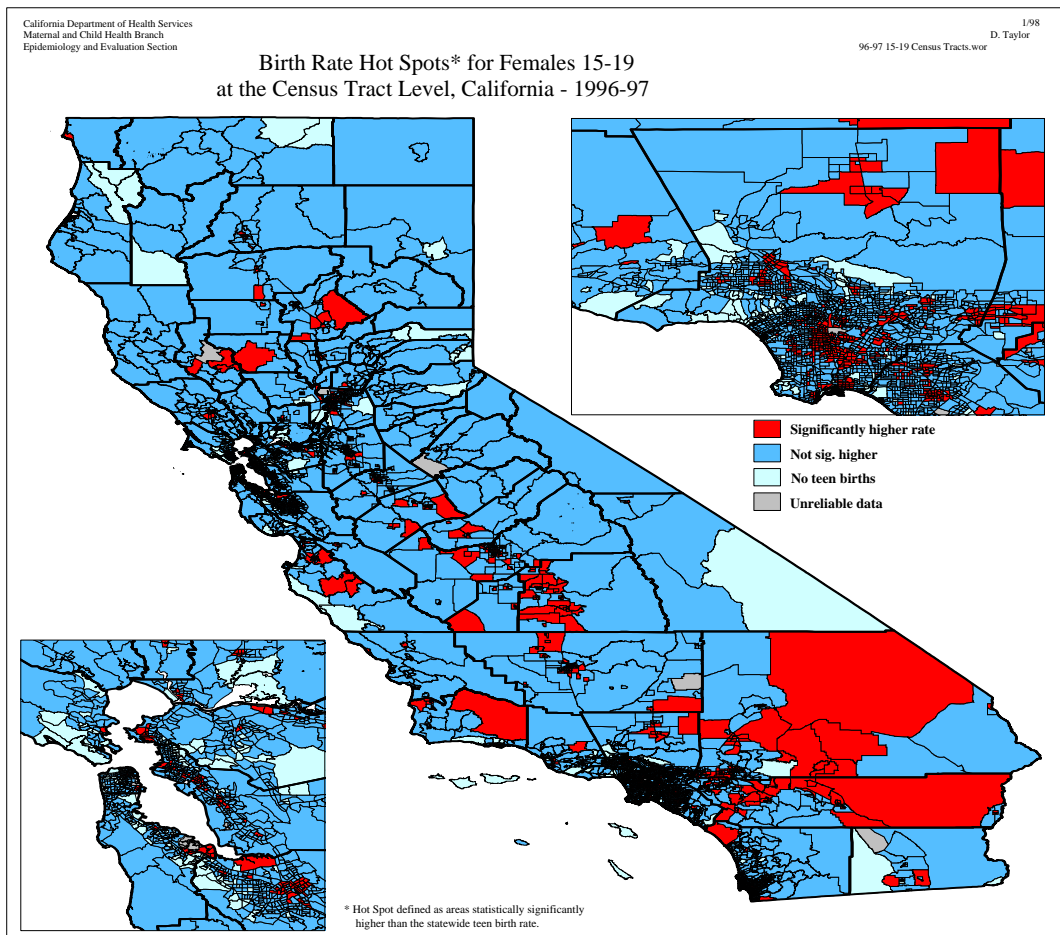
Don Taylor, MA, and Gilberto Chavez, MD, MPH
Maternal and Child Health Branch, California
Department of Health Services, Sacramento

In California, developing GIS efforts have focused around issues of health services delivery, resource allocation, and identification of high-risk areas. The California Department of Health Services, Maternal and Child Health Branch selected teenage birth rates as an initial GIS sub-county resource allocation project for several methodological and health policy reasons.

First, since teenage births occur in larger frequencies than other MCH problems, birth rate estimates in smaller geographic areas would be more reliable. Second, in the early 1990s, California had increased its financial commitment to fund teenage pregnancy prevention activities in response to rising

teenage birth rates. State program managers were requesting more and better information to justify their allocation of funding to areas with the greatest need. Lastly, it became clear that programs that deliver teenage pregnancy prevention interventions are best carried out by a local community-based approach for which small area analysis is well suited.¹

We initially turned to the teenage mother's residential ZIP Code for small area analysis of teenage birth rates, however once the initial maps were developed, we found that there were drawbacks to ZIP Code level maps.^{1,2} Consequently, we chose Census tracts because they are smaller and more precise, their boundaries change only once every 10 years, the populations within census tract boundaries are selected for purposes of population research, and the populations are more socio-demographically



homogeneous and are therefore of more utility in targeting specific high-risk groups.

However from our experience with the initial ZIP Code maps we found that program staff generally misinterpreted geographically large hot spots as large problems when in fact small hot spots with a large number of teenage births would be a better priority. To help solve this problem and to determine the teenage mother's census tract, we decided to overlay maternal residential frequencies through masking techniques.³ The teenage mother's actual residential location was used in calculating the teenage birth rates, however in displaying these locations they were randomly offset to within one mile of the actual location. We also refined this display technique so that maternal residential locations in census tracts with fewer than ten teenagers were not displayed.

The birth data addresses from the Automated Vital Statistics System (AVSS) were of good quality due to the high rate of birth certificate data processing automation throughout California. Through a series of consecutively looser geocoding passes with MapMarker, we had a very high 95.2% match rate at either the exact address or Zip+4 centroid.

After geocoding, MapInfo was used to determine in which census tract births were located. Depending on the number of births, either a Poisson distribution test or a Chi square test was used to determine statistical significance of the rate in the census tract compared to the statewide rate.⁴ In order to link the idea of a "hot" spot with a statistically significantly higher rate in a census tract, these census tracts were colored red (see Map).

Our maps have been used to select teenage pregnancy prevention program sites for direct funding by the Adolescent Family Life Program, the Male Involvement Program, and the Community Challenge Grant Program. Materials distributed by these programs have stated that funding decisions would be based primarily on the needs of the community as determined by hot spots, geographic frequencies, and availability of existing teenage pregnancy prevention services. There has been a favorable response to the teenage birth maps at the state, county and local levels. Consequently MCHB management has augmented

funding for both mapping equipment and GIS training for MCH staff. [Contact: Don Taylor at voice (916) 653-0056 or dtaylor@ccfc.ca.gov]

References:

R. Kirby. "Toward Congruence Between Theory and Practice in Small Area Analysis and Local Public Health Data." *Statistics in Medicine* 15, (1996): 1859-1866; C.M. Croner et al. "Geographic Information Systems (GIS): New Perspectives in Understanding Human Health and Environmental Relationships." *Statistics in Medicine* 15, (1996): 1961-1977; Armstron MP, et al. "Geographically Masking Health Data to Preserve Confidentiality." *Statistics in Medicine* 28, (1999): 497-525; National Center for Health Statistics. *National Vital Statistics Reports*. Hyattsville, Md.: U.S. Public Health Service, 1998.

Special Report

World-Wide-Web Accessibility and The New York State Cancer Registry: Complying with a State Accessibility Policy

Kathleen K. Thoburn, Colleen C. McLaughlin and Maria J. Schymura, New York State Cancer Registry [This presentation was given at the North American Association of Central Cancer Registries Annual Meeting in Miami FL, June 7, 2001] Summary: There is no question that the World Wide Web (WWW) is a valuable resource for the dissemination of information. However, as the magnitude of the population accessing information via the WWW increases, so does the magnitude of the population at risk for experiencing difficulties accessing that information. In regards to accessibility and usability of the WWW, able-bodied individuals have a distinct advantage over people with disabilities. Daily tasks such as reading a Web page, searching a Web site or purchasing a product using the Web are often complicated or impossible for a disabled person to carry out. Many Web sites are inaccessible to large segments of the disabled community, in particular individuals experiencing problems with vision, hearing, memory and dexterity.

On August 7, 1998 President Clinton signed the Workforce Investment Act of 1998, Section 508 of the Rehabilitation Act. Section 508 requires that members of the public with disabilities who are seeking information or services from a Federal Agency have access to and use of information and data that is equitable to that provided to non-disabled individuals.

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Following the lead of the Federal government in 1998, New York State formed the NYS Accessibility to Information Technology Work Group to make recommendations to the NYS Office for Technology on improving access to State Agency information via the WWW. In September 1999, the NYS Office for Technology released Technology Policy 99-3: Universal Accessibility for NYS Web Sites (Tech Policy 99-3), which requires that all New York State Agency Web sites provide universal accessibility to persons with disabilities. This policy became effective as of December 31, 2000, and clarifies NYS policy towards accessibility and provides a framework to achieve accessibility goals.

Agencies are directed to use the World Wide Web Consortium (W3C) Web Accessibility Initiative's Web Content Accessibility Guidelines (WCAG) in the design, creation and maintenance of all newly created official Agency Web sites. Tech Policy 99-3 requires the content of all NYS Agency Web pages to conform with the WCAG's conformance level "A", satisfying all Priority 1 checkpoints. It also requires each site to have a contact mechanism so individuals who might have trouble accessing any portion of the site can report the problem. All NYS Agencies were required to review, prioritize and modify existing content and pages by September 2000. On October 4, 2000 the deadline for compliance was extended to February 28, 2001.

The New York State Cancer Registry (NYSCR) was one of the first programs in the NYS Department of Health to post data tables in an accessible format. The NYSCR's annual publication 'Cancer Incidence and Mortality in New York State' contains over 100 tables of data, and had historically been posted in portable document format (PDF). As Tech Policy 99-3 requires the re-formatting of all PDF documents to documents containing W3C-approved markup languages (e.g., HTML) when possible, these tables needed to be re-generated and posted in an accessible HTML format. SAS programming was used to generate the tables. The program runs against a file of cancer incidence and mortality rates, and uses SAS coding to generate tables in HTML format that are W3C compliant for accessibility. The program

generates accessible HTML data tables for each of the 62 counties in NYS in less than two minutes, offering a great advantage over any manual effort.

Within the SAS code, accessibility is achieved primarily via association of the data cells of the tables

Site of Cancer	Incidence						Mortality					
	Males			Females			Males			Females		
	Average Annual Cases	Rate per 100,000 Males	95% CI (+/-)	Average Annual Cases	Rate per 100,000 Females	95% CI (+/-)	Average Annual Deaths	Rate per 100,000 Males	95% CI (+/-)	Average Annual Deaths	Rate per 100,000 Females	95% CI (+/-)
All invasive malignant cancers	744.2	473.3	15.4	705.4	329.2	11.6	349.8	216.8	10.3	344.2	14	
Oral cavity and pharynx	24.4	16.1	2.9	13.0	6.2	1.6	5.0	3.2	1.3	4.2		
Esophagus	14.4	9.5	2.2	5.2	2.0	0.8	11.6	7.7	2.0	3.6		
Stomach	17.0	10.4	2.2	10.4	3.4	1.0	10.8	6.7	1.8	8.4		
Colorectal	88.4	55.2	5.2	89.4	35.6	3.6	36.2	22.3	3.3	47.6	1	
Colon excluding rectum	63.0	39.2	4.4	67.2	26.4	3.1	28.6	17.4	2.9	40.4	1	
Rectum and rectosigmoid	25.4	16.0	2.8	22.2	9.2	1.8	7.6	4.9	1.6	7.2		
Liver and intrahepatic bile duct	12.2	7.8	2.0	3.2	1.2	0.6	8.0	5.1	1.6	2.6		
Pancreas	17.2	11.0	2.4	17.2	7.1	1.6	15.8	10.0	2.2	19.8		

with their respective header cells by utilizing the HTML headers, id and abbr attributes. In addition, summary statements are provided for each table at the beginning of each table definition. Further, more descriptive text is programmed behind the tables than what the tables visibly show. For example, when viewing the header of the first column of the HTML table for the county of Albany, New York resulting from the SAS program (see Web page to right), the words 'Average Annual Cases' are displayed. However, when a screen reader reads the data cell under Average Annual Cases for All invasive malignant cancers among males, it will state "Male Average Annual Incidence Cases 744.2".

The data tables posted by the NYSCR conform to the WCAG's Triple-A level of conformance for Guideline #5, as they satisfy all Priority 1, 2 and 3 checkpoints for that guideline. The HTML pages have been checked and approved utilizing the Web site validation tool "Bobby." [Copies of the above-described SAS program are available from Kathleen, Research Scientist, Albany, NY, at kkt01@health.state.ny.us; the following Web sites were utilized and found to be very helpful when defining and addressing accessibility issues regarding HTML data tables: <http://www.w3c.org> World Wide Web Consortium; <http://www.w3c.org/WAI> Web Access Initiative;

<http://www.w3.org/TR/WCAG10> Web Content Accessibility Guidelines; <http://www.w3.org/TR/html401/struct/tables.html> W3C recommendations for the generation of accessible tables; <http://www.w3.org/TR/WAI-WEBCONTENT/#gl-table-markup> W3C WAG Guideline #5-for generation of tables; <http://www.cast.org/bobby> Bobby is a Web site validation tool, developed by the Center for Applied Special Technology, that helps Web page authors identify and repair significant barriers to access by individuals with disabilities; <http://www.hj.com> Home page of Henter-Joyce, Inc., a division of Freedom Scientific, which offers free download of evaluation copies of the screen reading software JAWS (Job Access With Speech), which can be used by authors to assess how their pages will sound when read by a screen reader; <http://www lynx.browser.org> Lynx is a text-based browser that can be used to by authors to see what their pages will look like when viewed with Lynx, a text mode Web browser; <http://developer.webtv.net> Web TV Network service is an internet service accessed through set-top devices that connect to your television; authors can download to see what their pages will look like when viewed with Web TV]

V. Related Census, DHHS, FGDC and Other Federal Developments

HHS Announces New "Micro-grant" Approach to Enlist Community Support For Health Goals
HHS Secretary Tommy G. Thompson announced that HHS plans to award hundreds of "micro-grants" to community organizations for activities that support the goals of Healthy People 2010, the nation's public health agenda for the next decade. Worth up to \$2,010 each, the micro-grants represent a new, low-cost approach to foster effective prevention efforts at the community level. Each grant will support efforts by local groups to promote health education, quality care, access to care and other projects that support the far-reaching national health goals of Healthy People 2010. Faith-based organizations will be among those eligible to apply for funding. "This is a new idea for HHS, a way to leverage very small grants into very widespread action," Secretary Thompson said. "Though small in size, these grants can have a large impact by tapping

the potential of local organizations to make a difference in the lives of the people closest to them."

Healthy People 2010 has established a broad set of goals and specific targets for improving the nation's health over the next 10 years and, for the first time, has identified the Leading Health Indicators -- 10 high priority public health challenges. The plan is grouped into focus areas devoted to a comprehensive array of diseases, conditions and public health challenges, such as promoting exercise, reducing obesity and discouraging tobacco use. HHS will launch the new micro-grant initiative with a two-year pilot project. If successful, the approach could be expanded nationally. HHS will commit between \$500,000 to \$700,000 to a pilot project this year in order to study the potential of the micro-grant approach to further the goals of Healthy People 2010. The money will be distributed to local, non-profit organizations-and coalitions of such groups-in different geographic areas to support programs designed to increase the quality and years of healthy life of residents and to eliminate health disparities.

Grantees could use the money for such activities as developing anti-smoking campaign materials for local students, coordinating substance abuse prevention forums for parents in local schools, or other specific projects designed to promote prevention and improve health locally. Projects that involve coalitions of community groups may receive preference in obtaining funds. "The application will be easy to complete, so local groups can tap the money quickly and then focus immediately on health prevention projects in their communities," HHS Acting Assistant Secretary for Health Arthur J. Lawrence said. "We anticipate that much of the process will be handled electronically."

HHS will choose several not-for-profit organizations or groups of organizations to recruit, review and award grant applications in different geographic areas. Those organizations will make the decisions about micro-grants for specific community projects in their region. A notice published in today's Federal Register explains the application process. HHS' Office of Disease Prevention and Health Promotion will oversee the pilot project. More

information about Healthy People 2010, including a copy of the Federal Register notice, is available at www.health.gov/healthypeople. [HHS press releases, fact sheets and other press materials are available at www.hhs.gov/news]

Federal Geographic Data Committee (FGDC)

[The Federal Geographic Data Committee (FGDC) is an interagency committee, organized in 1990 under OMB Circular A-16, that 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 17 federal agencies that make up the FGDC (pending DHHS membership) 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>]

Deployment of the National Spatial Data Infrastructure to State and Local Government: The Case of Maryland's Geographic Data Implementation Team Plan and Example of the Cadastre Data Profile

(Prepared by the Maryland State Geographic Information Committee, July 26, 2001-Excerpts-Approved Draft) 3.0-The National Spatial Data Infrastructure and The White House Office of Management & Budget's Implementation Teams. The single most important document that regulates Federal agency mapping activities is OMB Circular A-16 which has been in effect since 1953. Circular A-16 is undergoing revision during 2001 to reflect Federal activities related to the National Spatial Data Infrastructure (NSDI). The purpose statement of the draft Circular A-16 states *"This revision describes the National Spatial Data Infrastructure (NSDI) as the technology, policies, standards, financing, procurement, human resources, and related activities necessary to acquire, process, distribute, use, and archive spatial data (e.g. information and process discovery, publishing data, publishing symbol libraries, query filtering, data fusing, earth imaging, photogrammetry, location processing, and spatial analysis). The NSDI will serve the interest of the Federal government and the nation by promoting public and private partnerships, assuring broad*

accessibility of spatial information through the Internet and other avenues and through emphasis of data standards that are independent of scale."

The White House's Office of Management and Budget (OMB) began a new initiative in July 2000, to complete the framework data that comprise the National Spatial Data Infrastructure (NSDI). A document titled *"Implementing a New Paradigm"* (Attachment A) was developed by OMB in response to an increased awareness within Federal agencies that accurate spatial data is a fundamental tool for governance in the 21st Century. In this document, OMB is calling for individual states to create **"Implementation Teams" (I-Team)** to foster the development of framework data within each state. OMB is offering assistance to state governments through assignment of a Federal Partners Team, a Financing Solutions Team and a Technology Assistance Group to work with each I-Team.

The following is excerpted from a publication titled Framework Introduction and Guide that was written by Rebecca Somers and published by the Federal Geographic Data Committee in 1997. "The framework is a collaborative effort to create a widely available source of basic geographic data. It provides the most common data themes (that) geographic data users need, as well as an environment to support the development and use of these data. The framework's key aspects are: *seven themes of digital geographic data that are commonly used; procedures, technology, and guidelines that provide for integration, sharing, and use of these data; and institutional relationships and business practices that encourage the maintenance and use of data.* The framework represents **"data you can trust"**-the best available data for an area, certified, standardized, and described according to a common standard. It provides a foundation on which organizations can build by adding their own detail and compiling other data sets."

The seven layers of the framework are **Elevation/Bathymetry, Hydrography, Geodetic Control, Cadastre, Transportation, Governmental Units, and Orthoimagery**. Maryland has a long history of developing and using framework layers to help accomplish the mission of state government. In

addition, many Maryland counties have significant GIS operations. Some use data produced at larger scales to meet county needs, while others rely on the products produced by state and federal agencies. Spatial data clearly improves the efficiency of government agencies and has played a significant role in Maryland's implementation of highly acclaimed planning efforts such as the Smart Growth Initiatives. Having access to suitable spatial data products has also aided the acquisition of large tracts of land for environmental protection strategies. In addition, it serves as the backbone of "high-tech" initiatives such as the CHART Center at the Department of Transportation.

Those familiar with the application and use of spatial data products have recently been fond of saying **"You can't have e-Gov without g-Gov"**. These individuals know that we can not fully implement e-Government unless we are first able to implement Geographic Information System (GIS) technologies to their fullest extent. The vast majority of government data (generally estimated at 80%) can be used more effectively when it is managed in a spatial or geographic context. It also has much greater value to the public in this form. The I-Team initiative provides an ideal opportunity (at precisely the right time in Maryland) for state and local government agencies to work together on the next generation of framework layers to provide a consistent large scale product across the entire state. Federal, State and local government agencies worked to develop a new strategic plan for GIS implementation in the State. **Part of our shared vision is a new framework comprised of seamless 1:2,400 scale layers.** It is more cost effective and logical to produce uniform 1:2,400 scale data products to meet national standards, and to generalize them where appropriate, than it will be to redevelop the existing array of scales and data to meet national standards. As data production prices continue to fall, new products can be created for the cost of reworking existing data. In addition, most observers agree that the general demand for spatial data has moved to 1:2,400 scale products in Maryland to support the needs of County and municipal governments, the private sector and utility companies.

Example of Cadastre Data Profile

15.1 General Discussion: Depending on the mapping technique used, a 1:2,400 scale cadastre file may be the most expensive framework data layer to produce. Maryland is fortunate to be one of only two states that maintain responsibility for parcel mapping at the state level. This allows for production of uniform products on a statewide basis such as the existing MdProperty View product. However, in spite of its small size, Maryland will likely incur greater expenses than many other states during creation of a cadastre layer for two reasons. First is the **number of parcels**, and the other reason is that our parcels are based on the **"Meets and Bounds"** system instead of the Public Land Survey System. A cadastre layer built on the "Meets and Bounds" system is inherently more difficult and expensive to accurately map.

Two basic options exist for creating a vector layer of parcel ownership. The first is to convert the existing parcel maps to a vector base and then "approximately hand fit" each parcel boundary to the visual references in a 1:2,400 scale orthophoto. This effort will create a vector based product that is more precise and useful than existing products, but can not be used for legal purposes. The second option uses a technique called COGO which is an acronym for Coordinate Geometry. Using this technique, an operator enters the "Meets and Bounds" from the deed description or plat for each property. Eventually a uniform cadastre layer is created by the accumulation of individual property plats. This technique requires a great deal of reconciliation, because many surveys are not accurate and the boundaries of adjoining parcels will not join or "close" properly. Assuming it is accurately created (under the supervision of a Licensed Land Surveyor), this layer can then be used for certain legal purposes.

There is also significant interest in the maintenance of information regarding lands managed under public ownership, currently about 15% of Maryland's land mass. Under the new 2000 Chesapeake Bay Agreement (C2K) each state will have to report public land ownership and show progress toward goals established by the Agreement to increase the acreage of public lands. Additionally,

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Maryland has many easement acquisition programs including the Maryland Agricultural Land Preservation Foundation easement program, the Maryland Environmental Trust easement program and the Maryland Historic Trust easement program. Each of these programs can benefit from more precise and larger scale cadastre data.

15.2 Existing Product: Several counties have initiated or completed vector based mapping of their parcels. An accurate and up-to-date inventory does not exist. The Maryland Department of Planning (MDP) produces MdProperty View which is a product that combines, 1) binary raster scans of the existing parcel maps, 2) a vector node for each parcel that is linked to 3) the Department of Assessment and Taxation's real property database and 4) other non-parcel specific layers that make the product more useful to a wider range of users. This digital map series is available for the entire state at a scale of 1:24,000. During the Vertical Integration of Spatial Data study, MDP determined that this product cost approximately \$818,000.00 to create. Since its introduction, it costs approximately \$1,228,000.00 to maintain the product on an annual basis. The existing product is created through a "zero-base budget" and depends on data sales to fund the operation. [For the full report from Maryland see <http://www.fgdc.gov/I-Team>]

Web Site(s) of Interest for this Edition:

Animations for Visualization

<http://www.epa.gov/airnow> The U.S. EPA has developed the AIRNow website to provide the public with easy access to national air quality information. The website offers daily air quality forecasts as well as real-time air quality for over 100 cities across the U.S., and provides links to more detailed State and local air quality websites. The AIRNow website presents comprehensive air quality maps and forecasts; supplies real-time images of air quality and visibility via webcams; displays air quality forecasts (good, moderate, unhealthy for sensitive groups, unhealthy, very unhealthy, hazardous) for "air action days" in major metropolitan areas around the country; and provides suggestions on what you can do to help improve the air quality where you live. The AIRNow

website has four primary areas: *Ozone Maps, Air Quality Forecasts, Where I Live and Publications.*

<http://www.crimereduction.gov.uk/toolkits/fa020405.htm> Hot Spots in Space and Time. Crime and disorder hotspot maps generate a snapshot of events for a particular period in time. Exploring hotspots in time also helps to understand the patterns and nature of crime in partnership areas. Hotspots in space, may only exist at certain times of day, and give rise to others during other time periods. One way to visualise the geographic and time elements of a crime and disorder is to compose animations. Each "frame" produced for the animation is a snapshot of crime or disorder patterns for a particular time period. The animation shows a typical day of crime in the London Borough of Harrow, created using one year's worth of data, split into 24 one hour frames (jpg files), and knitted together using Animation Shop.

<http://www.cdc.gov/ncidod/eid/vol4no4/parasharG.htm> Average time of peak rotavirus activity in the contiguous 48 states, United States, July 1991 to June 1997. This contour plot was derived using the median value for time of peak activity for each laboratory. The + indicates location of laboratories participating in the surveillance system. The surveillance system and analytic methods used to create this map are described in greater detail in Töörök TJ, Kilgore PE, Clarke MJ, Holman RC, Bresee JS, Glass RI. Visualizing geographic and temporal trends in rotavirus activity in the United States, 1991 to 1996. *Pediatr Infect Dis J* 1997;16:941-6.

www.lymelinks.org These animated maps of Lyme disease were prepared by Marjorie Roswell, Spatial Analyst, University of Maryland Baltimore County Center for Health Program Development and Management. They are illustrations of *reported* Lyme disease, compared with *Healthy People 2010* (HP 2010) goals. HP 2010 is a national health promotion and disease prevention initiative. The animated maps show rates relative to HP 2010 goals. HP 2010 sets a Lyme infection target of 9.7 new cases per 100,000 people. The current baseline is 17.4 per 100,000

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people. Five times the target is 48.5, and ten times the target is 97 cases per 100,000. Margie encourage readers and viewers to become familiar with the literature on the reporting (and underreporting) of Lyme disease at website <http://www.geocities.com/HotSprings/Oasis/6455/reporting-links.html>.

<http://members.home.net/ldecola/projects/health/animation.gif> These animated maps of West Nile Virus are being developed by Lee De Cola, Research Physical Scientist, U.S. Geological Survey and Adjunct Professor, George Mason University. The animation was generated as follows: numbers of West Nile virus positive crows in a county for each of 17 weeks were divided by county population to give an

incidence value that was associated with the 135 county centroids. These points were then kriged to give a varying incidence surface that were used in the animation.

<http://www.ph.ucla.edu/epi/snow.html> This is the University of California at Los Angeles (UCLA), Department of Epidemiology, School of Public Health site devoted to John Snow (1813-1858), a legendary figure in the history of public health, epidemiology and anesthesiology. Includes sight and sound animation describing the life and accomplishments of John Snow, and many resources on his identification of cholera outbreak from the Broad Street pump in 1854.

Final thought: Visualizing Spatial Phenomenon in Time

I hope you will take a few moments to review some of the example animations in the preceding section. One of the GIS frontiers in development is the incorporation of techniques to capture the temporal dimension of spatial events. In our efforts to display spatial events in time we have done so with a variety of “static” mapping and statistical techniques that capture either a point, in a moment of time, or some periodicity of the event. We map with the constraints that govern the data. Often the data may not be collected with consistent frequency. Also, confidentiality protections against possible unique geoidentification can result in some imposed combination of limits on geographical unit of reporting, localized road networks, data periodicity and data aggregation. These limitations are not unique to animations. However, animations provide a visual sense of continuity of events in both space and time. There appears to be communication or cognitive power in animation. Animation seems to enhance or improve our readability of event pattern change, trends and association with other spatial covariates.

Technology today supports animation. Computer tools allow us to build instant animations with animation wizards, reduce the size of our GIF files with supercompression, create sophisticated animated transitions between still images, rotate, crop, color-adjust and resize all or part of an animation sequence, convert animated GIF files to AVI for use with PowerPoint, and many other supportive functions. Based on scientific modeling tools we will animate future forecasts and with a high degree of spatial-statistical reliability. Animation is an exciting arena for GIS application. I think it would be worthwhile to build an animation resource library of GIS and related public health events. To that end, I invite readers to submit to me their web site animations of choice. I look forward to compiling these in a future edition and for all to share.

Charles M. Croner, Ph.D., Editor, *PUBLIC HEALTH GIS NEWS AND INFORMATION*, Office of Research and Methodology, National Center for Health Statistics, e-mail cmc2@cdc.gov. While this report is in the public domain, the content should not be altered or changed. This is the 42st edition with continuous reporting since 1994. The CDC/ATSDR Public Health GIS Users Group now serves more than 3,700 online professionals worldwide.

Please join us at NCHS on October 17 :NCHS Cartography and GIS Guest Lecture Series

Our GIS Home Page is located at <http://www.cdc.gov/nchs/gis.htm>