

PUBLIC HEALTH GIS NEWS AND INFORMATION

November 2001 (No. 43)

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



Selected Contents: Events Calendar (pp.1-2); (p.8); Public Health and GIS Literature 22); Website(s) of Interest (pp.22-24); Final



News from GIS Users (pp.2-8); GIS Outreach (pp.8-15); DHHS and Federal Update (pp.16-25); Thoughts (pp.24-25)

I. Public Health GIS (and related)Events SPECIAL NCHS/CDC/ATSDR GIS LECTURES: 14th Annual Geography Awareness Week

NOVEMBER 27, 2001 "GIS and Lyme Disease: Exploring Space-Time Relationships with Geostatistics," by Lee De Cola, Geographer and Mathematician, U.S. Geological Survey and **Charles M. Croner**, Geographer and Survey Statistician, Office of Research and Methodology, NCHS, CDC, from 2:00-3:30PM.

NOVEMBER 29, 2001 "LandView V: A Federal Spatial Data Viewer," by E. J. (Jerry) McFaul, Computer Scientist, U.S. Geological Survey, and **Peter Gattuso**, Information Management Specialist at the Environmental Protection Agency, from 2:00-3:30PM. These Geography Awareness Week and NCHS Cartography and GIS Guest Lecture Series programs will be held at the NCHS Auditorium, RM1100, Hyattsville, MD; Envision is available to offsite CDC/ATSDR locations; Web access is available nationally to non-CDC/ATSDR staff at <http://video.cdc.gov/ramgen/envision/live.rm>. The link will become active approximately 30 minutes prior to the event. Webcast viewers will need to have RealPlayer installed on their computers prior to the webcast.[See abstracts for 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]

☛ "GIS In Telecoms 2001," The Open GIS Consortium, Inc. (OGC) (Wayland, MA) and IIR Conferences-UK (UK), November 12-15, 2001, Geneva, Switzerland [See: <http://www.iir-conferences.com>]

☛ GIS Day 2001: "Discovering the World through GIS," November 14, 2001 [See: <http://www.gisday.com>]

☛ First Annual ESRI Health Conference, November 12-14, 2001, Washington, DC [See: <http://www.esri.com>]

☛ The Federal Committee on Statistical Methodology (FCSM) Research Conference, November 14-16, 2001, Arlington, Virginia [See: <http://www.fcsm.gov/events/index.html>]

☛ Confidentiality, Disclosure and Data Access Conference, Federal Committee on Statistical Methodology, January 7-9, 2002, Washington, D.C. [See: <http://www.census.gov/srd/sdc/index.html>]

☛ 2002 GITA (Geospatial Information & Technology Association) Annual Conference 25, March 17 - 20, 2002, Tampa, FL [See: <http://www.gita.org/events/webcasts/webcast.html>]

☛ 15th Annual Geographic Information Sciences Conference, "Thinking outside of the box: New GIS users and new GIS applications," Towson University,

March 25-26, 2001 [See: <http://cgis.towson.edu/tugis2002>]

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 **David Parrish**, US Environmental Protection Agency (EPA): U.S.-Mexico Border Grants, Request for Proposals: The U.S. Environmental Protection Agency is requesting grant proposals from U.S. county and city governments, U.S. Councils of governments, U.S. Indian Tribes, U.S. community-base organizations (CBOs), non-governmental organizations, U.S. Public schools and Universities. Special consideration will be given to U.S. CBOs, public schools, community colleges, and nongovernment organizations for projects within the U.S.-Mexico Border region, that area within 100 km on either side of the inland and maritime U.S.-Mexico border as defined in the La Paz Agreement (1983).

This is a regionally managed grants program whose goals and objectives directly relate to and are linked with the Border XXI Program. Successful grant applications will meet objectives of the Border XXI Program as outlined in the U.S.-Mexico Border XXI Program Framework Document and/or the annual Implementation Plans (1996, 1997-1998, 1999). The mission of the Border XXI Program is to protect public health and natural resources, and encourage sustainable development along the U.S.-Mexico border.

The original proposal plus one (1) copy must be mailed to the appropriate regional contact (see below) for the state in which the project will occur no later than **November 5, 2001**. [Grant Applications should be submitted to: 1) Region 6 (TX, NM), Alfredo Coy, U.S.-Mexico Border Program (6PD); USEPA, Region 6; 1445 Ross Avenue, Suite 1200, Dallas, TX 75202-2733; Voice: 214-665-2206; Email: coy.alfredo@epa.gov; and 2) Region 9 (CA, AZ), Dave Fege, Assistant Director, San Diego Border Liaison Office; USEPA, Region 9; 610 W. Ash St.,

Suite 905 San Diego, CA 92101; Voice: 619-235-4765; Email: fege.dave@epa.gov. Additional copies of this grant application can also be obtained through the EPA Border Liaison Offices located in El Paso (915-533-7273) or San Diego (619-235-4765), or call 1-800-334-0741. [Source: David at Parrish.David@epamail.epa.gov]

2. The Joint Program in Survey Methodology announces “**Statistical Disclosure and Disclosure Limitation**,” a two-day short course (see: <http://projects.isr.umich.edu/jpsm>), January 29-30, 2002, in Arlington, Virginia. The instructor is **Larry Cox**, Chief, Office of Research and Methodology (ORM), NCHS, CDC. Standard ethical, and often legal, survey practice demands that confidential data pertaining to individuals or entities not be revealed through released statistical data. This has resulted in a suite of survey methods for statistical disclosure limitation (SDL), several of which have become implemented in software and incorporated within the survey practices of statistical agencies.

This course will cover background and reasons for confidentiality protection; legal and administrative approaches to the problem; survey methods for quantifying disclosure and limiting disclosure in tabulations, microdata and public use statistical data base query systems; increasing data access by means of research data centers; and, experience with the use of SDL methods and their effects on the quality and completeness of released data products. Emphasis will be placed on recognizing potential disclosure and evaluating the effectiveness of disclosure limitation strategies by means of simple numeric examples. An OMB report, classroom notes, mathematical preliminaries, and references on disclosure limitation will be provided. [For more information call the JPSM at 800-937-9320 or email jpsm@umich.edu]

3. From **Susan Perlin**, US Environmental Protection Agency (EPA): My office, the National Center for Environmental Assessment (NCEA) is continuing to support Oak Ridge National Laboratory (ORNL) to develop the prototype of **LandScan USA** at the 90 meter cell size and to develop the user-friendly

population counting tool. Depending on funding, we hope to have the counting tool and most of the prototype finished by the end of this calendar year. Budhendra Bhaduri, the ORNL Project Officer, estimates it will cost about \$2M to develop LandScan USA at this resolution for the whole country, so we will need more collaborators to support this effort. Also, now in view of the recent terrorist activities, it is clear that having LandScan USA at this finer resolution will be a great asset to support efforts requiring knowledge about the location of both daytime and nighttime populations.

Because there has been so much interest in LandScan USA, we want to establish a Users' Group for the following purposes: 1) to keep all of you apprized on the progress of tool and database development; 2) to provide a forum where we can exchange ideas on other data layers and tools that need to be developed and incorporated into LandScan USA; and 3) to share ideas on other uses of, or problems with, LandScan USA. To help us get this Group started, I am asking you please confirm to me if you are interested in joining this Group. [Contact: Sue at Perlin.Susan@epamail.epa.gov]

4. From **Spencer Chainey**, UK: The UK Association for Geographic Information (AGI) is pleased to announce the launch of their **Crime and Disorder Special Interest Group** website at www.agi.org.uk/cdsig. The AGI Crime and Disorder SIG was formed in recognition of the increasing use of geographic information and desktop mapping applications for the measuring and analysis of patterns of crime and disorder. The aim of the SIG is to share expertise on crime and disorder mapping techniques, discuss concepts, present best practice, exchange ideas, and offer leadership and guidance on the use of geographic information, crime mapping methods, geographic profiling and crime pattern analysis. [Contact: Spencer at SChainey@infotech-europe.com]

5. From **Jay Morgan**, Towson University: The Center for GIS at Towson University (Towson, MD) is pleased to announce the offering of a new ESRI-Authorized Course, "**Introduction to ArcGIS I**" (for

ArcView 8, ArcEditor 8, and ArcInfo 8). This new two-day course introduces students to ArcGIS and provides the foundation for becoming a successful ArcView, ArcEditor, or ArcInfo user. Participants learn how to use ArcMap, ArcCatalog, and ArcToolbox and explore how these applications work together to provide a complete GIS software solution. The course covers fundamental GIS concepts as well as how to create, edit, and georeference spatial data. Attendees learn how to manipulate tabular data, query a GIS database, and present data clearly and efficiently using maps and charts. [Contact: Amy Matuska at amatuska@towson.edu]

B. Department of Health and Human Services Agency for Healthcare Research and Quality

5. Primary care is the underpinning of the health care system, and research studies have shown that having a usual source of care raises the chance that people receive adequate preventive care and other important health services. Data from **AHRQ's Medical Expenditure Panel Survey (MEPS)** reveal that: About 30 percent of Hispanic and 20 percent of black Americans lack a usual source of health care compared with less than 16 percent of whites; Hispanic children are nearly three times as likely as non-Hispanic white children to have no usual source of health care; and African Americans and Hispanic Americans are far more likely to rely on hospitals or clinics for their usual source of care than are white Americans (16 and 13 percent, respectively, versus 8 percent). [See: <http://www.ahrq.gov/research/minorix.htm>]

Agency for Toxic Substances and Disease Registry

6. "**Hypothesis Tests, Confidence Intervals and 21st Century Alternatives: Options for Dealing with Uncertainty in Public Health Science,**" **November 19, 2001**, ATSDR Science Seminar (Barry L Johnson Training Room, Building 35, Executive Park, Atlanta) from 9:00-10:15 a.m. (EST), by **Charles Poole**, University of North Carolina School of Public Health. [Contact: Olivia Harris oxh0@cdc.gov]

7. "**Working with Communities for Environmental**

Health,” November 29, 2001, from 1:00 - 3:30 p.m. (EST), a live satellite broadcast by the Agency for Toxic Substances and Disease Registry (ATSDR) and Public Health Training Network (PHTN); Panelist: Marshall Kreuter, former CDC Distinguished Scientist/Fellow and Donna Garland, Deputy Director of ATSDR’s Office of Policy and External Affairs. The goal is to enhance the professional’s ability to plan, implement and evaluate effective environmental health education activities that improve the capacity of individuals and communities to make informed decisions about behavioral, environmental and policy actions that can improve health and quality of life. [For questions about registration, please call the Division of Professional Development and Evaluation at 1-800-41-TRAIN (1-800-418-7246) or 404-639-1292]

Centers for Disease Control and Prevention

8. From **Betty Smith**, NCHS: This is to announce the publication on the Internet of the Provisional Tables on Births, Marriages, Divorces, and Deaths by State for 1998-2000. They may be found at <http://www.cdc.gov/nchs/> under Highlights section.

9. From **Viola King**, NCHS: The National Health and Nutrition Examination Survey (NHANES) announce the Internet release of the NHANES III, Series 11 No. 10A Hepatitis C Virus Genotype Data and Documentation. This data release contains the genotype of the 364 HCV RNA positive samples out of the 402 positive specimens for anti-HCV obtained during the survey. This release can be found at <http://www.cdc.gov/nchs/about/major/nhanes/nh3data.htm>. [Contact: Viola at vyk1@cdc.gov]

10. From **Dabo Brantley**, NCEH: The CDC/ATSDR GIS Users Group-Atlanta hosted the seminar “**Using GIS to Predict the Spread of West Nile Virus,**” by Sean Ahearn and Strite Potter, on October 17. The slide package is available on request. Two rescheduled presentations will be cohosted with the Division of Reproductive Health on **November 30, 2001: (1) “Measuring the Contribution of Contextual and Environmental Risk: Comparison of results using**

various levels of risk modeling for PTD,” by Jennifer Culhane, Thomas Jefferson Medical College, Irma Elo, University of Pennsylvania, and Kelley Farley McCollum, Health Federation of Philadelphia; and (2) “**A New Method for Analyzing Contextual Influences: Raster Density GIS 101 and its application to perinatal health,**” by Tony Smith, Amy Hillier, University of Pennsylvania, and Jennifer Culhane, Thomas Jefferson University. Both will be held at Rhodes Building, Atlanta, in Conference Rooms A, B & C. Web cast will be available. [Contact: Dabo at mdb4@cdc.gov]

Health Resources and Services Administration

11. The Area Resource File (ARF; see <http://www.arfsys.com>) is a database containing over 7,000 variables for each county in the US. ARF contains information on health facilities, health professions, measures of resource scarcity, health status, economic activity, health training programs, and socioeconomic and environmental characteristics. In addition, the basic file contains geographic codes and descriptors which enable it to be linked to many other files and to aggregate counties into various geographic groupings. The ARF System is comprised of data from over 50 different source files and results from processing millions of micro data records (e.g., NCHS detail mortality and natality records, AHA facilities, and AMA physician specialty data). All information contained on the file is derived from existing data sources. The great advantage to the Area Resource File Access System is that no knowledge of statistical programs/packages is necessary to extract the data. In addition, one does not even have to know MS Access to be able to effectively use the system.

A new release of the ARF data file is issued annually. The **2000 release** of the ARF is now available in MS Access (Versions 97 and 2000). This system enables users to select the variables they want to see, the counties they want to see them in, and the format (Access table or query, Excel, etc.) in which they want to see the data. The Access version is designed with a front-end component that allows the use of the data without knowing Access and also provides a direct link to the underlying data for those

users familiar with Access. In addition, the help file associated with the front-end contains the source information previously found only in the User Documentation file. **Independent Cities and Alaska Boroughs/Census Areas-** Previously, the data for only a few independent cities were broken out from their original counties.

The **2001 release** of the ARF contains data for all independent cities as well as for the Alaska boroughs and census areas. All data for 1992 and later are broken out for the independent cities and the Alaska boroughs/census areas unless otherwise noted in the User Documentation. **Revised FIPS Codes-** The 2001 release of ARF uses the standard FIPS codes rather than the modified FIPS codes previously used. **U.S. Territories-** For new data added to the 2001 release, information is provided when available from the source for the counties of the U.S. Territories Guam, Puerto Rico and the Virgin Islands.

National Institutes of Health

12. From **Ron Abeles**, Office of Behavioral and Social Sciences Research: December 10, 2001, NIH Symposium on Economic Perspectives on Health Disparities, Natcher Conference Center, 9:30AM-4:30PM. The Office of Behavioral and Social Sciences Research (OBSSR) and the National Center for Minority Health and Health Disparities (NCMHD) are planning a December 10 symposium on **Economic Perspectives on Health Disparities**. The goal of this one-day symposium is to expand our understanding of the economic implications of racial and ethnic health disparities in the U.S. and ultimately, to encourage research activities in this area.

Four papers by leading economists and policy analysts will be presented, each of which is directed toward estimating an aspect of the economic consequences of racial and ethnic health disparities. Robert Topel and Kevin Murphy (University of Chicago) will focus on the potential economic benefit to society of research and resulting interventions that would eliminate disparities. José Escarce (RAND) will attempt to estimate the health care system costs associated with health disparities. John Bound (University of Michigan) will estimate the effects of

health disparities on labor market performance. Finally, David Meltzer (University of Chicago) will explore the evidence relating disparities in health to investments in education. We hope that this symposium will highlight the importance of eliminating disparities by attempting to estimate the likely enormous costs to society. [Contact: Georgeanne Patmios at PatmiosG@od.nih.gov]

Substance Abuse and Mental Health Services Administration

13. From **Robert Stephenson**, Center for Substance Abuse Prevention: The Substance Abuse and Mental Health Services Administration (SAMHSA) convened a GIS Expert Panel on September 28, 2001, in Washington, D.C. SAMHSA is working towards creating a “behavioral health” GIS. Discussion centered on the availability of epidemiologic, census, and other socio-demographic georeferenced data related to mental health and substance abuse services need, risk, and vulnerability factors. [Contact: Bob at rstephens@samhsa.gov]

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

14. **The Joint Program in Survey Methodology** strives to increase the number of survey professionals from groups traditionally under-represented in the field. As part of the effort, a limited number of minority fellowships are available for African-Americans, Hispanic Americans, and Native American Indians. Short course information and schedules can be accessed at <http://projects.isr.umich.edu/jpsm>. A two-day short course entitled Introduction to Small-Area Estimation will be offered **November 15-16, 2001**.

15. **The overall health of the American population has improved over the past few decades, but all Americans have not shared equally in these improvements.** Among nonelderly adults, for example, 17 percent of Hispanic, and 16 percent of black Americans report they are in only fair or poor health, compared with 10 percent of white Americans. How much do differences in the health care that

people receive contribute to disparities in health? What strategies can overcome these differences in care? These are questions for health services research, and ones that researchers supported by the Agency for Healthcare Research and Quality (AHRQ, formerly the Agency for Health Care Policy and Research at <http://www.ahrq.gov>) have begun to address.

D. Other Related Agency or Business GIS News

16. From **Bill Davenhall**, ESRI: **First Annual ESRI Health Conference, November 12-14**, 2001, Washington, DC [See: <http://www.esri.com/industries/health/index.html>]. Geographic information system (GIS) software is an important analysis tool for health professionals. Managing and accessing geographic-based data is even more important as organizations and agencies develop their strategies for homeland security. GIS is a core tool for planning, mitigation, preparedness, response, and recovery for any emergency. Of course GIS is also the tool of choice for day-to-day services, community planning, and many other health related applications. To learn more, attend the ESRI Health Conference, and discover how GIS can help your organization.

17. From **Janet Thot-Thompson**, Multi-Sector Crisis Management Consortium: The October meeting of the Multi-Sector Crisis Management Consortium (MSCMC), Arlington, VA, included the presentation "A Perspective: The response to the 9/11 Terror Attacks," by Joseph Barbera, Co-Director, Institute for Crisis, Disaster and Risk Management, Professor of Engineering Management and Systems Engineering (Crisis & Emergency Management); Clinical Associate Professor of Emergency Medicine, George Washington University. [Contact: Janet at jtt@ncsa.uiuc.edu]

18. From **John Blodgett**, OSEDA (Office of Social & Economic Data Analysis), University of Missouri, Columbia: The Missouri Census Data Center has downloaded a complete collection of geographic header files from the Bureau's 2000 SF1 data directory and converted these to SAS data sets in our public archive. These can be accessed via the uexplore/xtract

software using <http://mcdc2.missouri.edu/cgi-bin/uexplore?/pub/data/sf12000@secure> to get to the 2000 sf1 directory and then clicking on the xxgeos subdirectory (at the very bottom) to get to the collection of geographic headers. A brief description of the collection is included in the Readme.html file (search on string "xxgeos") in the sf12000 directory (<http://mcdc2.missouri.edu/data/sf12000/Readme.html>).

The xxgeos directory has 2 data sets per state, 1 for census blocks and 1 for all other geographic levels. Thus, to get header information for all county subdivisions in Michigan (for example) you would go to the migeos.sas7bdat data set and code the filter: SumLev Equal To (=) 060 or to access block header info for all blocks in Autauga county, AL you would select data set alblks.sas7bdat and code the filter: County Equal To (=) 01001.

Finally, we created 3 national data sets with headers for the entire U.S. in single data sets. These are for counties (SumLev= 050), 5-digit ZCTAs (SumLevs 871 and 881) and places (SumLevs 160 and 155). These data sets are named uscntys.sas7bdat, uszctas.sas7bdat and usplaces.sas7bdat. To list all ZIP codes (5-digit ZCTA's) in the Chicago CMSA you would select data set uszctas.sas7bdata and code the filter: SumLev Equal To (=) 881 and MSACMSA Equal To (=) 1602. This will actually list portions of ZCTA's within counties (SumLev 881) rather than complete ZCTAs (SumLev 871). The variables you can select from include the pop100 and hu100 counts as well as total and land area in square miles, internal coordinate points, and other relevant geocodes. (Note that codes for County and MSACMSA are present on the ZCTA-within-county level, 881, but not on the complete ZCTA level (871).) You can also access the LogRecNo variable which can be used to link to the sf1 data files (not included, except for a handful of states at our site.) Those of you familiar with the MABLE/Geocorr application (see <http://www.oseda.missouri.edu/plue/geocorr>) will recognize the fact that this collection has the potential for becoming the basis of a MABLE2000. [Contact: John at blodgettj@umsystem.edu]

19. From **Space Imaging**, Denver CO: Space Imaging announced an agreement [see <http://www.spaceimaging.com/newsroom/releases/2001/navtech.htm>] with Navigation Technologies Corporation (NTC) where Space Imaging is a master reseller of NAVTECH® NAVSTREETS(tm) data, and Navigation Technologies is a reseller of Space Imaging data products. Under the agreement, Space Imaging will sell accurate road-network map data using NAVTECH NAVSTREETS data from Navigation Technologies. NAVSTREETS data is a detailed, vector representation of the road networks in both North America and Europe. Space Imaging will sell the data by individual states (in North America) in three different levels-Base, Standard and Premium. The Standard product includes addresses and the Premium product includes navigation attributes such as one-ways, turn restrictions and lane dividers. NAVSTREETS data is available in both MapInfo and ArcView formats. [Source: Space Imaging News Wire, October 22, 2001]

20. From **Mark E. Reichardt**, Open GIS Consortium, Inc.: The Open GIS Consortium, Inc. (OGC) announces that a **Call for Participation/Request for Quotation for the Multi-Hazard Mapping Initiative (MMI)**. Phase I is available for download at <http://ip.opengis.org/mmi>. This pilot project, sponsored by the US Federal Emergency Management Agency (FEMA), will establish a limited operational framework of interoperable services to illustrate the advantages of using products with OGC interfaces to access, fuse and visualize critical spatial information in support of FEMA multi-hazard mitigation, response and recovery functions. FEMA is an independent agency of the federal government, reporting to the President. Since its founding in 1979, FEMA's mission has been to reduce loss of life and property and protect the nation's critical infrastructure from all types of hazards through a comprehensive, risk-based, emergency management program of mitigation, preparedness, response and recovery.

By implementing interoperable geospatial services based on OGC interfaces, FEMA will be able to operationally demonstrate the value of a "common

thread of interoperability" across federal, state, and local agencies and with other organizations supporting mitigation efforts. During the pilot, spatial information from multiple agencies and sources will be accessed across the Internet using vendor products and reference implementations developed during OGC's previous Interoperability Initiatives. Responses to the CFP/RFQ are due **November 21**, 2001 at 1:00 PM EDT and the program is expected to begin later this year with completion by March 2001. Inquiries related to MMI should be addressed to Jeff Harrison, Director of OGC Interoperability Programs. [Contact: Jeff at jharrison@opengis.org]

21. From **GEOTec Media**: 39th Annual Urban and Regional Information Systems Association (URISA) Conference and Exposition Oct. 21-24, 2001 (excerpts)-The first day also featured a special session titled **"GIS in New York City: Response to the World Trade Center Attack."** The session provided behind-the-scenes accounts by personnel from PlanGraphics Inc. and ESRI Inc. who were instrumental in setting up and staffing the New York City Emergency Mapping and Data Center. Their stories, images and around-the-clock efforts created a strong sense of appreciation from the crowd, and upon closing the speakers were rewarded with a standing ovation...The keynote address on the third day was delivered by Michael Goodchild, chair of the Executive Committee, National Center for Geographic Information and Analysis (NCGIA), and professor, University of California-Santa Barbara. His talk, **"GIS: Time for a Change,"** was a play on words to reflect his belief that GIS is changing as a result of new technologies and research to capture the dimensions of time in addition to space. He said that policy is driven by changes, not by constants, and that to capture the imagination of decision-makers you must be able to illustrate change. [Source: GEOReport, October 26, 2001, at geo-from@dsi-epubs.net]

22. From **ESRI Virtual Campus** (Protecting Your Investment in Data with Metadata): Mystified by metadata? Protecting Your Investment in Data with

Metadata deciphers the U.S. Federal Geographic Data Committee (FGDC) metadata standards and teaches how to create FGDC-compliant and useful metadata using ArcGIS™ software. This course is designed for GIS professionals who are interested in learning how to create and maintain metadata for geospatial data. To learn more, go to <http://campus.esri.com/index.cfm?cid=35>. [Source: ESRI Virtual Campus Newsletter, October 20, 2001 at campusinfo@esri.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: **Bill Gross**, Gaston County Health Department (NC): At a recent in-service education program on the Health Insurance Portability and Accountability Act (HIPAA), our staff was told we could map patient information only with the permission of our clients. Looking forward, this would necessitate signed permission, which should not pose a significant problem. At the same time, we were also told we might not be able to use existing patient records, including those that predate HIPAA, for GIS mapping. Can you clarify the rules of engagement for GIS under HIPAA? [Contact: Bill at bgross@co.gaston.nc.us]

☛ From **Ric Skinner**, GIS Consultant: I have been asked by a colleague at large northeastern healthcare system for some guidance on what other hospitals/healthcare systems are doing to incorporate GIS into bioterrorism response, management and recovery. I would be interested in hearing from other Public Health GIS Users in this regard. [Contact: Ric at wskinner@fast.net]

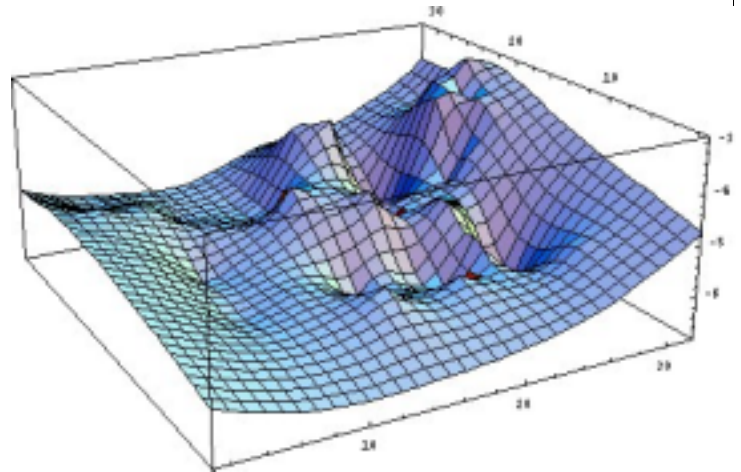
☛ From **Basil Low**, Singapore Health Office: In Singapore, we define a dengue cluster (referring to an outbreak when dengue fever is spreading contagiously from one person to the next) as at least 2 cases (points) within 200 m of each other and within 3 weeks of incidence of each other. With about 2,000 cases so far this year, I have about 80 clusters according to this definition. However, I suspect that the occurrence of some clusters (especially the ones with just 2 or 3

cases) may be by chance, instead of an actual disease transmission happening. How can I test this? Possibly, a Monte Carlo simulation of some kind will help. Is there any software out there that can help to do this? SATScan has got some promising functions, unfortunately it deals with areal or polygon data and not point data (I think). [Contact: Basil at Basil_LOH@env.gov.sg]

IV. Public Health GIS Presentations and Literature

Special NCHS Cartography and GIS Guest Lecture Series: Celebrating our 14th Annual Geography Awareness Week at NCHS

(1) November 27, 2001. "GIS and Lyme Disease: Exploring Space-Time Relationships with Geostatistics," by **Lee De Cola**, Geographer and Mathematician, US Geological Survey and **Charles M. Croner**, Geographer and Survey Statistician, Office of Research and Methodology, NCHS, CDC, at NCHS, from 2:00-3:30PM. Abstract: The purpose of this exploratory research is to consider the use of kriging in mapping routinely-reported national public health data. Traditionally, choropleth or area maps are commonly used to display geographic and temporal



epidemiologic events. Kriged maps may strengthen our ability to visually communicate event patterns, especially over time. As a geostatistical modeling technique, kriging takes into account the existing

underlying spatial structure of georeferenced information (distances among samples or observations). Statistically optimal estimates and their standard errors for locations with missing data may be derived and the actual and estimated data represented as a smoothed surface using Geographic Information Systems (GIS). Keywords: kriging, GIS, spatial autocorrelation, visualization.

November 29, 2001. "LandView 5: A Federal Spatial Data Viewer," by **E. J. (Jerry) McFaul**, Computer Scientist, U.S. Geological Survey, and **Peter Gattuso**, Information Management Specialist at the Environmental Protection Agency, at NCHS, from 2:00-3:30PM. Abstract: For local state and health departments with scarce GIS resources, LandView 5 may be a cost-effective startup, interim, or supplementary mechanism for basic GIS applications. LandView 5 reflects the collaborative efforts of the U.S. Environmental Protection Agency (EPA), the U.S. Census Bureau, the U.S. Geological Survey (USGS), and the National Oceanic and Atmospheric Administration (NOAA) to provide the public ready access to published Federal spatial and related data (see <http://landview.census.gov>).

The LandView database program (developed in FileMaker Pro 5.5) allows users to browse and query records extracted from **EPA's Envirofacts Warehouse**, demographic statistics from the **U.S. Census Bureau's Decennial Census**, and the **USGS Geographic Names Information System (GNIS)**. The LandView program provides the following capabilities: Display current or queried records on a map; Calculate the population and housing counts within a radius; Export data to popular spreadsheet and database formats; Locate a street address on the map; Create thematic maps displaying census demographic data; and Provide Internet access to the online databases of EPA, Census and USGS.

The MARPLOT desktop mapping system creates computerized maps that the user can customize by turning on or off various map layers such as roads, hazardous waste facilities, schools and places. These maps cover the entire United States and display: EPA regulated sites; A detailed network of major and

minor roads (over 6.3 million miles), rivers, and railroads based on the U.S. Census Bureau's TIGER/Line® files; Legal entities states, counties, cities and towns, and congressional districts); Census statistical entities (such as census tracts and block groups); and, Geographic names for places, features, and areas from the USGS Geographic Names Information System.

LandView 5 is a radically different product from LandView III. Some changes include: Demographic data are now based on Census 2000 data, including **ZCTAs [ZIP Code Tabulation Areas]** which are generalized area representations of U.S. Postal Service ZIP Codes. The EPA and USGS data have been updated as well; New address finder function allows users to quickly locate an address on a map based on street and ZIP Code; A greatly improved population/housing unit estimator now based on 8 million plus Census 2000 blocks; Internet interface to sponsoring agencies to retrieve the most recent data; MARPLOT® mapping program has several enhancements including WYSIWYG printing of maps and a shape file translator utility that allows importing ESRI Shape Files into the MARPLOT User map; Addition of Barrios and Barrios-Pueblos to Puerto Rico under the Minor Civil Division (MCD) layer; and others at http://landview.census.gov/geo/landview/lv5help/whats_new.html. [Contacts: Jerry at jmcfaul@usgs.gov or Peter at gattuso.peter@epa.gov]

CDC Emerging Infectious Diseases and MMWR

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 November-December 2001 (Vol. 7, No. 6) edition of CDC's journal, Emerging Infectious Diseases (EID), is now available at website <http://www.cdc.gov/ncidod/EID/upcoming.htm>. This

issue contains several articles on smallpox related to new vaccines and modeling for bioterrorism.

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. 42- Update: Investigation of Bioterrorism-Related Anthrax and Interim Guidelines for Exposure Management and Antimicrobial Therapy, October 2001; Weekly Update: West Nile Virus Activity-United States, October 17-23, 2001; Notice to Readers: National Lead Poisoning Prevention Week-October 21-27, 2001; Notice to Readers: Availability of Final Recommendations on Reducing the Risk for Transmission of Enteric Pathogens at Petting Zoos, Open Farms, Animal Exhibits, and Other Venues; Vol. 50, No. 41- Update: Investigation of Anthrax Associated with Intentional Exposure and Interim Public Health Guidelines, October 2001; Recognition of Illness Associated with the Intentional Release of a Biologic Agent; Weekly Update: West Nile Virus Activity-United States, October 10-16, 2001; Vol. 50, No. 40- Cigarette Smoking among Adults-United States, 1999; Weekly Update: West Nile Virus Activity-United States, October 3-9, 2001; Notice to Readers: Ongoing Investigation of Anthrax-Florida, October 2001; *Recommendations and Reports*, Vol. 50, Number RR-17, *CDC Response to a Report from the National Vaccine Advisory Committee*; Vol. 50, No. 39- Vaccination Coverage Among Children Enrolled in Head Start Programs and Licensed Child Care Centers and Entering School-United States and Selected Reporting Areas, 1999-2000 School Year; Public Health Dispatch: Update: Outbreak of Poliomyelitis-Dominican Republic and Haiti, 2000-2001; Weekly Update: West Nile Virus Activity-United States, September 26-October 2, 2001. Vol. 50, No. 36- Influence of Homicide on Racial Disparity in Life Expectancy-United States, 1998; Notice to Readers: Publication of *Health, United States, 2001 with Urban and Rural Health Chartbook* (see <http://www.cdc.gov/mmwr/preview/mmwrhtml/mm>

[5036a4.htm](#)); Notice to Readers: Satellite Broadcast on Immunization.

Other Literature: Annual Reports, Books **Health, United States, 2001**

with Urban and Rural Health Chartbook

CDC has published *Health, United States, 2001 with Urban and Rural Health Chartbook*, the 25th edition of the annual report on the nation's health. This report includes 148 trend tables organized around four broad subject areas: health status and determinants, health-care use, health-care resources, and health-care expenditures. Disparities in health by race/ethnicity and socioeconomic status are presented in several tables. This year's report also includes the *Urban and Rural Health Chartbook*. Communities at different urbanization levels differ in their demographic, environmental, economic, and social characteristics, and these characteristics influence the magnitude and types of health problems that communities face. The chartbook presents population characteristics, health risk factors, health status indicators, and health-care access measures for residents of counties grouped by five urbanization levels (from the most urban to the most rural). Of U.S. residents examined, those who have the best health measures are residents of fringe counties of large metropolitan areas. In comparison, the urbanization level associated with adverse health measures is less consistent. Residents of the most rural counties fare worst on some measures (e.g., motor vehicle traffic-related injury mortality) and residents of the most urban counties fare worst on other measures (e.g., homicide). [Additional information about the report is available at <http://www.cdc.gov/nchs> (click on "Top 10 Links" to locate "Health, United States")]

An Introductory Guide to Disease Mapping

Andrew B. Lawson, Fiona L. R. Williams, March 2001(John Wiley & Sons). This introductory guide explains the basic principles underlying the construction and analysis of disease maps. Growing public awareness of environmental hazards has increased the demand for investigations into the geographical distribution of disease and as data resulting from studies is not always straightforward to

interpret, there has been a need for an accessible, clearly written introduction to the subject. This book supplies the reader with an array of tools and skills so that maps may be produced and correctly interpreted, and also describes the role of disease mapping within epidemiology, highlighting its important role in studies of environmental health and environmental epidemiology. It provides: ·An introduction to new developments in disease mapping; ·Comprehensive coverage of an active area of research and development; ·Numerous case studies to highlight the application of the techniques discussed. This text will be invaluable to anyone with an interest in disease mapping, and is an essential volume for both the specialist and the non-specialist. It is of particular relevance to epidemiologists, medical statisticians, geographers, and public health advisors, as well as environmental health workers, occupational health physicians, and infectious disease specialists. Table Of Contents: Introduction; Visual Perception and Map Construction; Data Types and Sources; Basic Methods; Study Design; Advanced Methods; Public Health Surveillance and Mapping; Appendix: Software for Disease Mapping.

A Social Health Atlas of Australia

A Social Health Atlas of Australia, second edition (produced by John Glover, Kevin Harris and Sarah Tennant), and made available April, 2000 by the Public Health Information Development Unit, University of Adelaide, South Australia. The project was funded by the Commonwealth Department of Health and Aged Care and supported by the South Australian Department of Human Services. The information in this atlas adds to a convincing body of evidence built up over a number of years in Australia on the striking disparities in health that exist between groups in the population. People of low socioeconomic status (those who are relatively socially or economically deprived) experience worse health than those of higher socioeconomic status for almost every major cause of mortality and morbidity. The challenge for policy makers, health practitioners and governments is to find ways to address these health inequities. The atlases (nine volumes) draw together a

wide range of information on the demographic and socioeconomic characteristics of the Australian population. The nine volumes cover Australia (entire country), New South Wales, Victoria, Queensland, South Australia, Western Australia, Tasmania, Northern Territory, and Australian Capital Territory. Contents include: 1. Medical Geography; 2. Statistics; 3. Public health- Maps; 4. Public health- Statistics; 5. Health facilities- Utilization Maps; 6. Health facilities- Utilization Statistics; and, 7. Health surveys. In Volume I, there are chapters that address: Demography and socioeconomic status, Income support payments, Health status, Utilisation of health services, Availability of selected health services, Statistical analysis, and Methods. [The atlases and supporting data are available at <http://www.publichealth.gov.au>]

Ecosystem Change And Public Health:

A Global Perspective

Ecosystem Change and Public Health: A Global Perspective (Johns Hopkins University Press, 2001), edited by Joan L. Aron, and Jonathan A. Patz, has earned a Seal of Approval from the NASA Earth Science Enterprise. NASA cites the book as an outstanding interdisciplinary text for upper level undergraduate and graduate students in studying the connections between global change and public policy. Main contents include: **Part I: Approaches-** Information on Issues of Global Change, Epidemiological Study Designs, Geographical Information Systems, The Science/Policy Interface, and Integrated Assessment; **Part II: Environmental Changes-** Human Populations in the Shared Environment, The Changing Chemistry of Earth's Atmosphere, An Earth Science Perspective on Global Change, Water Resources Management, and Ecology and Infectious Disease; **Part III: Case Studies-** Cholera and Global Ecosystems, Malaria and Global Ecosystem Change, Global Climate Change and Air Pollution: Interactions and Their Effects on Human Health, and Too Little, Too Much: How the Quantity of Water Affects Human Health [See: <http://www.jhupbooks.com/aron>]

**Confidentiality, Disclosure and
Data Access: Theory and Practical Applications
for Statistical Agencies**

Edited by Pat Doyle, Julia Lane, Jules Theeuwes, and Laura Zayatz (The U.S. Census Bureau and Elsevier Science of Reed Elsevier, Inc., forthcoming). This new book presents the latest developments in statistical data protection methodology and application. There is a fundamental tension at the heart of every statistical agency's mission. Each is charged with collecting high quality data to inform National policy and enable statistical research. This necessitates dissemination of both summary and microdata. Each is also charged with protecting the confidentiality of survey respondents. This often necessitates blurring the data to reduce the probability of the reidentification of individuals. The trade-off dilemma, which could well be stated as protecting confidentiality (avoiding disclosure), but maximizing access, has become more complex as both technological advances and public perceptions have altered in an information age. Fortunately, statistical disclosure limitation techniques have kept pace with the rapidly growing changes affecting data access and dissemination. [See announcement Part I (this edition) of conference January 7-9, 2002, with contributors to this book]

**Other Literature: Articles, Reports from GIS Users
GIS and Anthrax**

A national register of historic and contemporary anthrax foci. Cherkasskiy BL. *J Appl Microbiol* 1999 Aug;87(2):192-5, Central Research Institute of Epidemiology, Moscow, Russia. **Abstract.** Anthrax in Russia has for a long time posed a serious problem for public health and veterinary services. At the beginning of the century, 40-60 thousand cases of this infection were annually reported in the country in agricultural animals and about 10-20 thousand cases in people where each fourth (25%) was dying. In the Russian Federation the registration of anthrax foci is obligatory for veterinary as well as for sanitary-epidemiological services. So our initial project, funded by the International Technical and Scientific Center in Moscow, has envisaged the collection of all data of known anthrax foci, including the village name,

agricultural council, region, oblast and year of occurrence. The objective is to assemble a reference handbook, "Register of stable anthrax sites in the Russian Federation", containing organized information on more than 10 000 anthrax foci occurring during the past 100 years. Such a study makes it possible to identify regions characterized by the highest concentrations of stationary anthrax sites in Russia, to identify trends in expressed activity of such sites through the periodic emergence of disease in humans and animals, and to determine the factors contributing to the formation of such trends. In doing this, it makes it possible to develop contingency plans for different risk locations (i.e. high risk of persistent infection, high risk of sporadic occurrence, low risk areas, etc.) in terms of anthrax in Russia, to identify high risk areas and develop a differentiated strategy of vaccination and other control strategies, and to develop preventive recommendations to reduce risk in high risk areas. It is now important to develop the second step of the project: to develop in depth studies of particular clusters to determine which factors are associated with Russian anthrax outbreaks. Maps will greatly enhance the value of this work in terms of spatial analysis. Furthermore, this supplementary project will allow the incorporation of powerful Geographic Information System (GIS) electronic mapping technology so that natural geographic features, such as soil type, climate, etc., can be compared with anthrax distributions in Russia using standard GIS and statistical analysis. At the present time, it is imperative to develop a detailed understanding of the world's distribution of anthrax and what geographic factors determine its prevalence.

GIS and Faith-Based Operations

Use of innovative technologies in the evaluation of Nashville's REACH 2010 community action plan: reducing disparities in cardiovascular disease and diabetes in the African American community, Schlundt DG, Mushi C, Larson CO, Marrs M. J; *Ambulatory Care* 2001; 24 (3): 51-60. [Note: Within the National Center for Chronic Disease Prevention and Health Promotion at CDC, the Racial and Ethnic Approaches to Community Health (REACH 2010)

project is an initiative aimed at eliminating disparities in health status experienced by ethnic minority populations in key health areas (see: <http://www.cdc.gov/reach2010>). This article reports on the use of geographic information systems (GIS) technology as part of REACH. **Abstract:** Ethnic minorities in the United States suffer disproportionately from chronic diseases such as cancer, heart disease, AIDS, and diabetes. A nationally-funded initiative known as Racial and Ethnic Approaches to Community Health (REACH) has designated 26 communities to implement demonstration projects to reduce health disparities in targeted minority populations. This article presents two methods of integrating innovative technologies into the program's evaluation plan: (1) a Web-based data entry system for recording project activity and (2) geographic information systems (GISs) for developing visual maps of project targets [Editor: e.g., location of faith-based organizations (where to introduce church-based nutrition and exercise programs) and participation of individuals throughout the community (to visualize needed efforts to engage others)]. These technologies can assist other programs in managing and measuring community-based public health initiatives. Key words: community intervention, evaluation research, geographic information systems, health disparities.

GIS and Dasymetric Mapping Methods

Dasymetric mapping and areal interpolation: Implementation and evaluation, Eicher CL, Brewer CA. *Cartography and Geographic Information Science* 2001; 28 (2): 125-38. **Abstract:** Dasymetric

maps display statistical data in meaningful spatial zones. Such maps can be preferable to choropleth maps that show data by enumeration zones, because dasymetric zones more accurately represent underlying data distributions. Though dasymetric mapping has existed for well over a century, the methods for producing these maps have not been thoroughly examined. In contrast, research on areal interpolation has been more thorough and has examined methods of transferring data from one set of map zones to another, an issue that is applicable to dasymetric mapping. Inspired by this work, we tested five dasymetric mapping methods, including methods derived from work on areal interpolation. Dasymetric maps of six socio-economic variables were produced for a study area of 159 counties in the eastern U.S. using county choropleth data and ancillary land-use data. Both polygonal (vector) and grid (raster) dasymetric methods were tested. We evaluated map accuracy using both statistical analyses and visual presentations of error. A repeated-measures analysis of variance showed that the traditional limiting variable method had significantly lower error than the other four methods. In addition, polygon methods had lower error than their grid-based counterparts, though the difference was not statistically significant. Error maps largely supported the conclusions from the statistical analysis, while also presenting patterns of error that were not obvious from the statistics. Keywords: Dasymetric mapping, areal interpolation, mapping census data, map error.

Special Report

Using GIS To Protect Public Drinking Water: An Early Notification System For Surface Water Intake Facilities

Benjamin T. Aller, GIS Specialist, Chester County Health Department, West Chester, PA

azardous material spills and bioterrorism pose an imminent threat to the quality of public water supplies which maintain in-stream water intakes. As chemicals escape into waterways, it is crucial that public water suppliers be notified as quickly as possible so that their intakes can be closed down to avoid contaminants in the water treatment system. And with the increase in bioterroristic threats to people and the environment, it's important that local health departments take additional steps to deal with environmental and human contamination from unknown sources.

Between 2000 and early 2001, Chester County Pennsylvania experienced several hazardous material spills which threatened the County's waterways and consequently its surface water intakes (SWIs). The Health Department's ability to respond to such disasters was compromised because it lacked an accurate method for determining the direction of streamflow and thus quickly notifying the public water suppliers. With over 3,300 miles of natural waterways and 12 surface water intakes (SWI) serving approximately 50% of the County's 433,500 population, the Health Department clearly recognized the need for a reliable early notification system.

One of the initial goals was to first "build up" communications between agencies responsible for emergency and environmental response. The County's Department of Emergency Services (DES) is usually the first to respond to a disaster, so the Health Department's "on-call" staff and the Pennsylvania Department of Environmental Protection (DEP) rely on DES for locational information. Multi-departmental meetings between these agencies spawned the use of pagers to relay information. Once DES pages other departments with information on where a release occurred, staff can then use GIS to quickly analyze SWIs at risk, as well as the surrounding environment and population at risk.

The Health Department began implementing the GIS application by taking inventory of what data it had and what data was needed. It was using ArcView for other Public Health programs and had several layers already shared by the GIS Department. The SWI layer was provided by DEP, so the only layer still needed was hydrological data that supported upstream and downstream navigation. Research efforts yielded surface water coverages from USGS's National Hydrography Data (NHD). Though not as detailed as the County's surface water layer, NHD features were already networked and available with a set of navigation tools. The final requirement was to

And with the increase in bioterroristic threats to people and the environment, it's important that local health departments take additional steps to deal with environmental and human contamination from unknown sources.

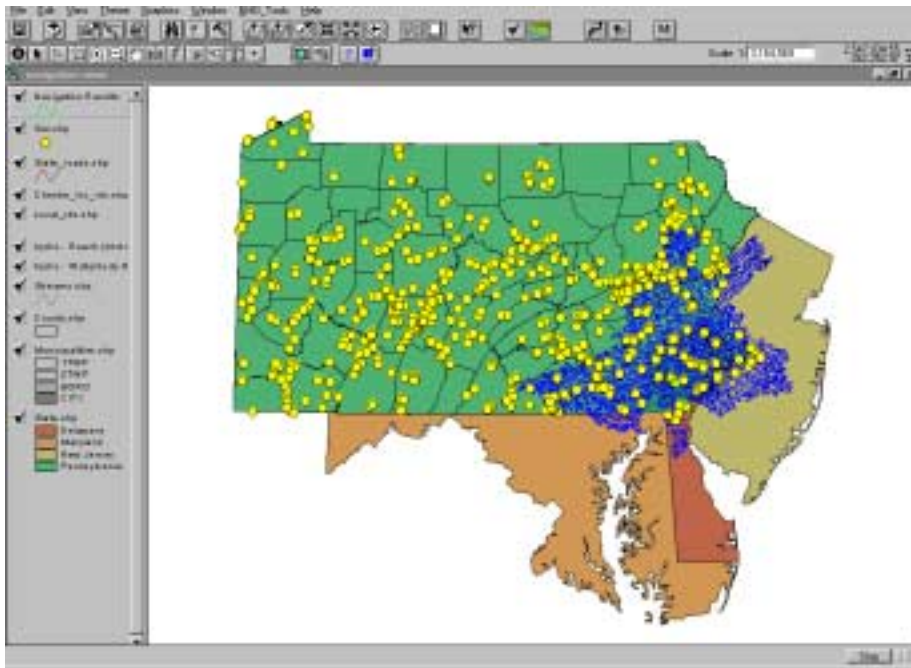


Fig. 1- The state of PA has 620 surface water intakes (yellow dots)

provide some programming to determine which facilities are at risk and how far they are from the source of contamination.

After several weeks of research, testing, and programming, the application was built. The application starts with the user locating the origin of the chemical release using a street address or street name, supplied by DES. Once the search parameters are entered, the system zooms to that specified location. If the user does not know

whether the contaminants have entered surrounding surface water, then he or she must identify the surface water feature(s) near the source which may be at risk for carrying chemicals downstream. Once this is done, the user selects that surface water feature using USGS's NHD navigate tools to determine the downstream path. Finally, the user clicks a button which programmatically determines what SWIs are in the downstream path. The application can then generate a html report showing a map, a list of facilities which could be impacted, how far downstream they are from the source, and who to contact if a facility is found to be at risk. The report also sorts the list of facilities by their proximity from the source, so the user can immediately begin notifying facilities about an approaching contamination hazard.

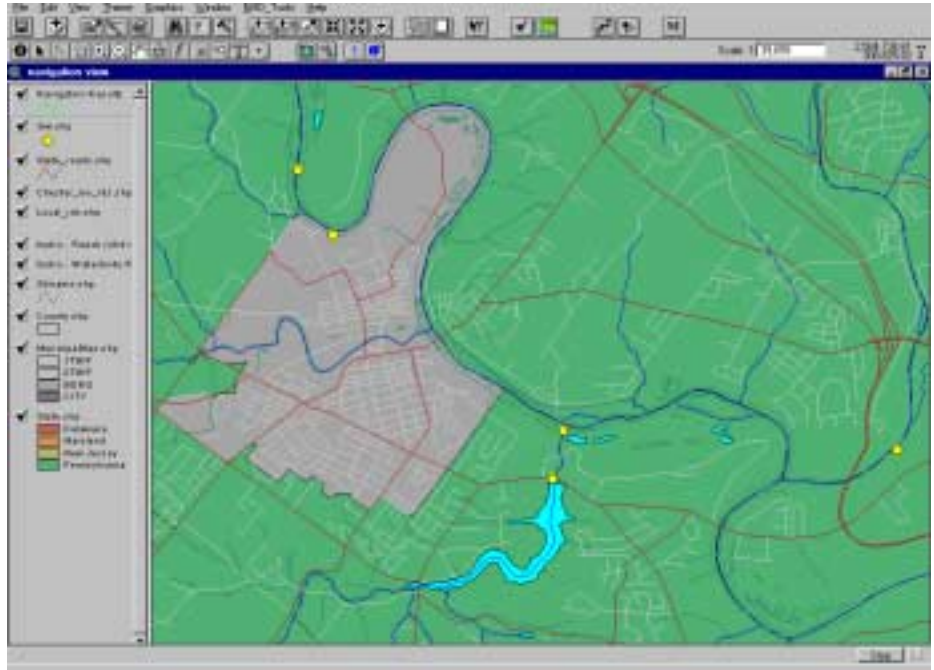


Fig. 2- Phoenixville Borough on Schuylkill River- Home to 4 surface water intakes

The NHD navigate tools also allow the user to navigate upstream. This is potentially significant from a bioterroristic standpoint. If contamination is found in surface water or in a SWI, investigators may not know where the contamination came from. Using the Navigate Upstream tool, the user can determine the possible surface water and tributaries that could have fed the chemicals downstream. From there, GIS can be used to determine every parcel of land that the upstream surface water passes through, and every road that provides an access point to the surface water. Addresses and contact names can then be generated from the parcel attributes to help in an investigation.

The application simplifies efforts tremendously and has already proven successful in several hazardous material spills. Immediately after Health Department staff were notified of a spill, the application was used, and the public water intake facilities were notified within minutes. Chester County was able to improve communications between agencies responsible for emergency and environmental response, and promote the expanding use of GIS. Its strong support has resulted in it being shared with staff in the County's Emergency Operations Center (EOC) and DEP.

One of the real successes of this application is that it was created with limited resources and virtually no costs other than time spent. At present, the application is limited to navigating with NHD coverages, but future plans include enhancements to the surface water network, and adding storm drains, industrial water intakes and recreation areas. It's likely that variations of the application will be used by the Health Department for environmental studies as well. [Contact: Ben at baller@chesco.org]

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

CDC Public Health Emergency Preparedness and Response Program

Based on a rigorous case definition, CDC is reporting [as of October 29] **15 confirmed cases** of anthrax: 2 in Florida, 3 in New York City, 5 in New Jersey, and 5 in Washington, D.C. (in collaboration with MD and VA). CDC is also reporting **4 suspect cases**: 3 in New York City and 1 in New Jersey. CDC defines a confirmed case of anthrax as 1) a clinically compatible case of cutaneous, inhalational, or gastrointestinal illness that is laboratory confirmed by isolation of *B. anthracis* from an affected tissue or site or 2) other laboratory evidence of *B. anthracis* infection based on at least two supportive laboratory tests.

Facts about Anthrax

Anthrax is an acute infectious disease caused by the spore-forming bacterium *Bacillus anthracis*. Anthrax most commonly occurs in hoofed mammals and can also infect humans. Symptoms of disease vary depending on how the disease was contracted, but usually occur within 7 days after exposure. The serious forms of human anthrax are inhalation anthrax, cutaneous anthrax, and intestinal anthrax. Initial symptoms of inhalation anthrax infection may resemble a common cold. After several days, the symptoms may progress to severe breathing problems and shock. Inhalation anthrax is often fatal.

The intestinal disease form of anthrax may follow the consumption of contaminated food and is characterized by an acute inflammation of the intestinal tract. Initial signs of nausea, loss of appetite, vomiting, and fever are followed by abdominal pain, vomiting of blood, and severe diarrhea. Direct person-to-person spread of anthrax is extremely unlikely, if it occurs at all. Therefore, there is no need to immunize or treat contacts of persons ill with anthrax, such as household contacts, friends, or coworkers, unless they also were also exposed to the same source of infection.

In persons exposed to anthrax, infection can be prevented with antibiotic treatment. Early antibiotic treatment of anthrax is essential—delay lessens chances for survival. Anthrax usually is susceptible to penicillin, doxycycline, and fluoroquinolones. An

anthrax vaccine also can prevent infection. Vaccination against anthrax is not recommended for the general public to prevent disease and is not available.

Facts about Botulism

Botulism is a muscle-paralyzing disease caused by a toxin made by a bacterium called *Clostridium botulinum*. There are three main kinds of botulism: Foodborne botulism occurs when a person ingests pre-formed toxin that leads to illness within a few hours to days. Foodborne botulism is a public health emergency because the contaminated food may still be available to other persons besides the patient; Infant botulism occurs in a small number of susceptible infants each year who harbor *C. botulinum* in their intestinal tract; and wound botulism occurs when wounds are infected with *C. botulinum* that secretes the toxin.

With foodborne botulism, symptoms begin within 6 hours to 2 weeks (most commonly between 12 and 36 hours) after eating toxin-containing food. Symptoms of botulism include double vision, blurred vision, drooping eyelids, slurred speech, difficulty swallowing, dry mouth, muscle weakness that always descends through the body: first shoulders are affected, then upper arms, lower arms, thighs, calves, etc. Paralysis of breathing muscles can cause a person to stop breathing and die, unless assistance with breathing (mechanical ventilation) is provided. Botulism is not spread from one person to another. Foodborne botulism can occur in all age groups.

A supply of antitoxin against botulism is maintained by CDC. The antitoxin is effective in reducing the severity of symptoms if administered early in the course of the disease. Most patients eventually recover after weeks to months of supportive care.

Facts about Pneumonic Plague

Plague is an infectious disease of animals and humans caused by the bacterium *Yersinia pestis*. *Y. pestis* is found in rodents and their fleas in many areas around the world. Pneumonic plague occurs when *Y. pestis* infects the lungs. The first signs of illness in pneumonic plague are fever, headache, weakness, and cough productive of bloody or watery sputum. The pneumonia progresses over 2 to 4 days and may cause

septic shock and, without early treatment, death. Person-to-person transmission of pneumonic plague occurs through respiratory droplets, which can only infect those who have face-to-face contact with the ill patient.

Early treatment of pneumonic plague is essential. Several antibiotics are effective, including streptomycin, tetracycline, and chloramphenicol. There is no vaccine against plague. Prophylactic antibiotic treatment for 7 days will protect persons who have had face-to-face contact with infected patients.

Facts about Smallpox

Smallpox infection was eliminated from the world in 1977. Smallpox is caused by variola virus. The incubation period is about 12 days (range: 7 to 17 days) following exposure. Initial symptoms include high fever, fatigue, and head and back aches. A characteristic rash, most prominent on the face, arms, and legs, follows in 2-3 days. The rash starts with flat red lesions that evolve at the same rate. Lesions become pus-filled and begin to crust early in the second week. Scabs develop and then separate and fall off after about 3-4 weeks. The majority of patients with smallpox recover, but death occurs in up to 30% of cases.

Smallpox is spread from one person to another by infected saliva droplets that expose a susceptible person having face-to-face contact with the ill person. Persons with smallpox are most infectious during the first week of illness, because that is when the largest amount of virus is present in saliva. However, some risk of transmission lasts until all scabs have fallen off.

Routine vaccination against smallpox ended in 1972. The level of immunity, if any, among persons who were vaccinated before 1972 is uncertain; therefore, these persons are assumed to be susceptible. Vaccination against smallpox is not recommended to prevent the disease in the general public and therefore is not available. **In people exposed to smallpox, the vaccine can lessen the severity of or even prevent illness if given within 4 days after exposure.** Vaccine against smallpox contains another live virus called vaccinia. The vaccine does not contain smallpox virus. The United States currently has an

emergency supply of smallpox vaccine. There is no proven treatment for smallpox but research to evaluate new antiviral agents is ongoing. Patients with smallpox can benefit from supportive therapy (intravenous fluids, medicine to control fever or pain, etc.) and antibiotics for any secondary bacterial infections that occur. [Source: See <http://www.bt.cdc.gov>]

Privacy Rule: Health Insurance Portability and Accountability Act

[Mandated by the Health Insurance Portability and Accountability Act (HIPAA), the final rule implementing the privacy standards covers health plans, health clearinghouses, and health providers who transmit health information electronically. The rule became effective April 14, 2001 and health care providers must comply with applicable requirements by April 14, 2003. The site provides links to a number of documents containing information about the rule; See: http://inside.nchs.cdc.gov/opbl/Privacy%20Rule/privacy_rule.htm]

Areas of Particular Interest to NCHS in the Final Regulation on Standards for Privacy of Individually Identifiable Health Information

The regulation covers health plans, health clearinghouses, and health providers who transmit health information electronically or for whom transactions are electronically transmitted on their behalf (referred to as "covered entities"). NCHS is not a covered entity, but to the extent that we obtain information from covered entities NCHS activities could be affected. All medical records and other individually identifiable health information used or disclosed by a covered entity in any form- electronic, paper, or oral -are covered by the regulation.

Disclosure of Identifiable Information by Covered Entities. The regulation restricts how covered entities can use and disclose protected health information. Individual authorization is required for some disclosures, but not for others. The regulation allows for the use and disclosure of identifiable health information without individual authorization for research and public health purposes subject to certain conditions. Disclosures that are made, with certain exceptions, must be limited to the minimum information necessary to accomplish the purpose of the disclosure and must be disclosed consistent with the practices described in the entity's privacy notice.

Privacy Notice. The regulation gives

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individuals a right to a notice of the uses and disclosures of their protected health information. The notice must include (among other things) a description of each of the purposes for which the covered entity is permitted or required to disclose information without authorization as specified in this regulation. If a covered entity chooses to limit its permissible disclosures, it may describe these more limited disclosures in its notice. Covered entities are permitted to change their privacy practices and the associated notice. For a covered entity to change a practice described in a notice to apply to information created or received prior to issuing a revised notice, its notice must contain a statement reserving the right to change the terms of its notice and to make the new notice provisions applicable to all protected health information.

The preamble of the regulation indicates that the Department will develop further guidance on notice requirements prior to the compliance date, and encourages states, state professional associations, and other organizations to develop model language to assist covered entities in preparing their notices.

Disclosures for Research Purposes. Covered entities can disclose protected health information for research purposes without individual authorization if the research is approved by a properly constituted IRB (or equivalent privacy board) and the covered entity obtains signed documentation that the IRB has approved a waiver of the authorization for disclosure of protected health information. The documentation must include a description of the information approved for disclosure and must include a statement that the IRB has determined that a waiver of authorization satisfies the following criteria: the disclosure involves no more than minimal risk to the individual; the waiver will not affect the privacy rights and welfare of the individual; the research could not practicably be conducted without the waiver; the research could not practicably be conducted without access to and use of the protected health information; the privacy risk is reasonable in relation to the expected benefits and the knowledge that may result from the research; there is an adequate plan to protect the identifiers from improper use and disclosure; there is an adequate plan

to destroy the identifiers at the earliest opportunity consistent with conduct of the research, unless there is a health or research justification for retaining the identifiers; and there are adequate written assurances that the protected health information will not be reused or disclosed further except for other research that would be permitted by this regulation.

De-identified Information. The regulation specifies that information that does not identify an individual and with respect to which there is no reason to believe that the information can be used to identify an individual is not individually identifiable health information. It establishes two possible procedures for determining that health information is "de-identified:" (1) a knowledgeable person applying appropriate methods determines that the risk is very small that the information could be used alone or in combination with other reasonably available information to identify an individual; or (2) a specific set of 18 identifiers - ranging from names to medical record numbers, and including zip codes except for the first three digits of a zip code if the three digit zip code includes at least 20,000 people-has been removed from the information.

Applicability to Deceased Persons. Generally, the regulation applies to protected health information of deceased persons in the same manner as to other persons. It permits covered entities to disclose information about a deceased person for research purposes, however, without authorization of a patient representative and without IRB approval. Before doing so, the covered entity must confirm that the researcher is conducting research only on deceased persons and that protected information is necessary for the research project. The covered entity may obtain proof of death from the researcher.

Disclosures for Public Health Activities. Covered entities can disclose protected health information without individual authorization to public health authorities that are authorized by law to collect or receive such information for the purpose of preventing or controlling disease, injury, or disability, including, but not limited to, the reporting of disease, injury, vital events such as birth or death, and the conduct of public health surveillance, public health

investigations, and public health interventions.

Disclosures for Reporting of Births and Deaths. The regulation does not preempt state law and state procedures established under such law providing for the reporting of birth or death. As discussed above, the reporting of vital events is also addressed in the section of the regulation dealing with uses and disclosures for public health activities. This section allows covered entities to disclose protected health information without authorization to public health authorities that are authorized by law to collect or receive such information for the reporting of vital events such as birth or death.

Disclosures about Decedents. The regulation permits covered entities to disclose protected health information without authorization to coroners and medical examiners to determine cause of death and for other purposes. It also permits information to be disclosed to funeral directors, consistent with law, to carry out their duties.

Adherence to Fair Information Practices. Covered entities are required to adhere to certain fair information practices giving individuals certain rights. In addition to the notice provisions discussed above, individuals have: the right to obtain access to information about themselves; and the right to obtain an accounting of how their protected health information has been disclosed within the last six years (there are a few exceptions to this provision such as for treatment, payment, or health care operations); the accounting must include the date of disclosure, name of the person who received the information, a brief description of the disclosure, and a statement of the purpose of the disclosure.

Preemption of Existing Law. Generally, the regulation preempts state laws that are contrary to it. The regulation does not preempt state laws that are more stringent, nor does it preempt state laws in certain areas, such as the reporting of births and deaths. It also does not impact federal law such as NCHS' 308(d) authority or other similar federal confidentiality laws.

Selected Definitions.

"Disclosure means the release, transfer, provision of access to, or divulging in any other

manner of information outside the entity holding the information."

"Individually identifiable health information is information that is a subset of health information, including demographic information collected from an individual, and: (1) Is created or received by a health care provider, health plan, employer, or health care clearinghouse; and (2) Relates to the past, present, or future physical or mental health or condition of an individual; the provision of health care to an individual; or the past, present, or future payment for the provision of health care to an individual; and (i) That identifies the individual; or (ii) With respect to which there is a reasonable basis to believe the information can be used to identify the individual."

"Protected health information" refers to all individually identifiable health information that is transmitted or maintained by a covered entity.

"Public health authority means an agency or authority of the United States, a State, a territory, a political subdivision of a State or territory, or an Indian tribe, or a person or entity acting under a grant of authority from or contract with such public agency, including the employees or agents of such public agency or its contractors or persons or entities to whom it has granted authority, that is responsible for public health matters as part of its official mandate."

"Research means a systematic investigation, including research development, testing, and evaluation, designed to develop or contribute to generalizable knowledge." [Questions concerning the Privacy Rule may be directed to Alvan Zarate, NCHS Confidentiality Officer, at aoz1@cdc.gov]

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>]

HOMELAND SECURITY AND GEOGRAPHIC INFORMATION SYSTEMS

How GIS and mapping technology can save lives and protect property in post-September 11th America

Introduction

Timely, accurate information, easily accessed and capable of being shared across federal, state, and local political jurisdictions is fundamental to the decision making capability of those tasked with the homeland security mission. But without the real-time ability to quickly visualize activity patterns, map locations, and understand the

The FGDC believes it is imperative that the Nation accelerate implementation of the NSDI

multi-layered geospatial context of emergency situations, homeland security will not be achieved.

The current state of geospatial information technology can provide decision-makers the data they need to confidently confront a wide variety of threats including natural disasters, terrorist attacks, sabotage, and similar crises. However, the current *implementation* of that technology, across all the federal, state, and local agencies and jurisdictions necessary to fully coordinate an effective response, is seriously lacking in specific areas.

As the concept of Homeland Security becomes infused into the work-a-day pattern of government and the everyday life of our citizens, decision makers will greatly profit from the crisis management “edge” that GIS provides. Homeland Security leaders should understand and implement the policy changes necessary to fully realize this technology’s capability, and make the management decisions necessary to implement it on a national basis.

Background

As never before, in the aftermath of the terrorist attacks of September 11, it has become clear that in emergency situations of whatever origin our Nation is dependent on rapid access to and application of many types of current, accurate geospatial

information. Critical information such as:

- ❖ Facilities and operations susceptible to attack.
- ❖ Critical infrastructure, including telecommunications; electrical power systems; gas and oil production, storage and distribution; banking and finance; water supply systems; emergency services.
- ❖ Accurate employment data tied to specific locations.
- ❖ Detailed and current “framework” data, including orthophotography, transportation, elevation, political boundaries, property ownership, hydrography and geodetic control.

Powerful geographic information systems are now available that quickly render one to several layers of digital geospatial data into map-like products. These systems can facilitate near-real time performance of a wide range of relevant geospatial analyses. These systems can be used to access and process digital geospatial data virtually anywhere because it, unlike analog data, can be instantly transmitted from wherever it’s maintained and stored to any place where its needed.

These characteristics make geographic information technologies, combined with appropriate sets of geospatial information, an invaluable tool for the handling, display, and analysis of information involved in every aspect of Homeland Security. For example:

Detection: Geospatial information provides the spatial and temporal backdrop upon which effective and efficient threat analysis is accomplished. By linking and analyzing temporally and spatially associated information in real time, patterns may be detected that lead to timely identification of likely modalities and targets.

Preparedness: Emergency planners and responders must often depend on geospatial information to accomplish their mission. Current, accurate information that is readily available is crucial to ensuring the readiness of teams to respond. Geospatial information access and interoperability standards are essential elements as they support the means for the Nation’s response units to react to terrorist attacks, natural disasters, and other emergencies.

Prevention: Geospatial information provides a means to detect and analyze patterns regarding terrorist

threats and possible attacks. This information, coupled with information about borders, waters, and airspace, in turn may lead to the disruption of their plans or the prevention or interdiction of their attacks.

Protection: Geospatial information is a very important component in the analysis of critical infrastructure vulnerabilities and in the use of decision support technologies such as visualization and simulation to anticipate and protect against cascading effects of an attack on one system as it relates to other interdependent systems.

Response and Recovery: Geospatial information has been used by many organizations in response to and recovery from natural disasters. Similarly, this information is invaluable for emergency response services of all kinds, as well as for carrying out long-term recovery operations. The Federal Response Plan, developed by 26 federal agencies and the Red Cross, identifies overall responsibilities and the concept of operations for presidential declared disasters. A number of emergency support functions are identified, with the Federal Emergency Management Agency (FEMA) having the lead for coordinating response to natural disasters and the federal wildland agencies responsible for coordinating response to wildland fires.

Current Status

Accurate and comprehensive data are the heart of information technology, and **geographic location is a key feature of 80-90% of all government data.** It is critical that as a Nation we take the steps necessary to assure that strategic information assets relative to Homeland Security--particularly geospatial information assets--are created, are maintained for currency and accuracy, are readily available to those who need them, and are interoperable. Although Homeland Security requires much of the same basic real-time spatial information needed for other uses and applications, we know from recent events that it must be immediately and comprehensively available.

In short, we need to assure:

- ❖ Implementation of a comprehensive national spatial data infrastructure,
- ❖ Interoperability of the systems that process this information, and
- ❖ Commonality of the processes that collect, manage,

and disseminate geospatial information.

Fortunately the Nation already has a well-founded interagency effort under way to build such a National Spatial Data Infrastructure (NSDI) under the auspices of the Federal Geographic Data Committee (FGDC) which is chartered by the Office of Management and Budget. The NSDI provides crosscutting mechanisms for organizations of many types, affiliations, and responsibilities to be able to collaborate in assuring that geospatial data and systems are in-place, ready for use. The data, technology, and associated intergovernmental and government-private mechanisms forged in this effort will be invaluable to intelligence, law enforcement, and other national security-related elements, as well as to local communities, in dealing with terrorism and other major threats to public safety and welfare.

In collaboration with all levels of government, industry, and academia, the FGDC and its member federal agencies have in-place a wide variety of effective organizational relationships and processes that could readily be used and expanded upon as needed -- given appropriate sanction and backing -- to produce a nationally consistent framework of Homeland Security-related base data characterized by common data content standards and supported by interoperable technologies. Several examples already exist of how this process works well:

- ❖ The coordinated application and use of geospatial data in New York City in response and recovery to the World Trade Center attack.
- ❖ Development of geospatial data as a foundation for critical infrastructure protection and emergency preparedness/response in the greater Chicago area.
- ❖ The use of geospatial information in wildfire suppression through the coordinated work of the Geospatial Multi-Agency Coordinating Group

However, at present there are gaps that should be filled to achieve assurance of data and technology accessibility and interoperability. Examples are:

- ◆ National data standards still need to be developed for a number of framework and other data themes to provide data that is immediately useful in Homeland Security events.
- ◆ NSDI Framework Themes are not yet complete.

◆ E911 capabilities are limited by the lack of consistent, standardized road data across the Nation, preventing true interoperability between all levels of government.

◆ Current and accurate information about the Nation's critical infrastructure is not consistently available or shareable among relevant agencies, leaving the Nation unable to effectively plan for modern terrorist activities.

The FGDC believes it is imperative that the Nation accelerate implementation of the NSDI. As we move forward to improve and support planning and management activities, the contribution of geospatial information and technologies in support of critical decision-making should be fully utilized. The NSDI has already established certain standards, processes, and relationships that serve to advance Homeland Security including:

□ Well established relationships with Federal, State, Local and Tribal governments and ongoing coordination mechanisms such as I-Teams, an initiative to collect basic framework data collaboratively among all levels of government.

□ A multi-node geospatial information Clearinghouse Network that can be extended to promote rapid discovery, sharing, and protection of critical geospatial information.

□ Access to industry and international standards bodies and programs to advance standards that promote data consistency and interoperability of spatial technologies.

Recommendations

It is our opinion that more needs to be done to fully realize the potential this technology brings to decision making. To that end, we recommend that the Office of Homeland Security consider the following recommendations:

1. Address the gaps outlined above by supporting:
 - a. National data standards
 - b. Completion of all NSDI Framework Themes
 - c. Nationwide geospatial data compatibility for E911 operations
 - d. Compilation of comprehensive georeferenced information on Critical Infrastructure
2. Bring additional focus on these activities to elected

officials at all levels of government across the Nation.
3. Promote, enhance, and provide sufficient resources for collaborative relationships between federal, state and local agencies and with the private sector.

4. Develop uniform approaches to planning for Homeland Security events while relying on standardized data and systems.

5. Develop sophisticated mobile GIS labs and trained staff that can be delivered to any site in the Nation within 12 hours of an event. [Source: FGDC, October 26, 2000-will be posted at www.fgdc.gov under What's New]

Web Site(s) of Interest for this Edition: Focus on Public Health and Bioterrorism

<http://www.bt.cdc.gov> Website of the **CDC Public Health Emergency Preparedness and Response Program**. As an example, CDC has started a cooperative agreement program for state and major local public health departments to help improve their preparedness and response capabilities for bioterrorism. CDC has identified the biological agents most likely to be involved in a terrorist attack and developed case definitions to assist in detection and medical management of infection with these agents. CDC has established a Rapid Response and Advanced Technology laboratory that can provide rapid identification of biological and chemical agents that are rarely seen in the United States. The newly established National Pharmaceutical Stockpile Program will allow caches of medical materiel located throughout the nation to be on site within 12 hours of a bioterrorist event. A nationwide, integrated information, communications, and training network, being developed through the Health Alert Network (HAN), National Electronic Data Surveillance System (NEDSS), and Epidemic Information Exchange (*Epi-X*), will include the integration of several CDC efforts. The network will allow highspeed Internet communications, including early-warning broadcast alerts, among CDC and state and local health departments.

<http://www.bt.cdc.gov/DocumentsApp/faqs.asp> CDC Anthrax Update: Interview with Jeffrey P. Koplan,

Director, CDC, October 18, 2001. **The following questions are available in text and video formats at** <http://www.cdc.gov/od/oc/media/qa.htm>:--*What is CDC's role in the anthrax investigation?* --*What is the average risk of contracting anthrax?* --*What can the average person do to protect himself/herself?* --*Should people buy and store antibiotics?* --*Should the public be vaccinated against anthrax?* --*Can a person get screened or tested for anthrax?* --*What are the symptoms of anthrax?* --*Is anthrax contagious?* --*What should an individual do about suspicious mail?*

<http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5042a1.htm> **Update: Investigation of Bioterrorism-Related Anthrax and Interim Guidelines for Exposure Management and Antimicrobial Therapy, October 2001**, CDC's *MMWR* October 26, 2001/50(42);909-919 online report which updates previous findings, provides new information on case investigations in two additional areas, presents the susceptibility patterns of *Bacillus anthracis* isolates, and provides interim recommendations for managing potential threats and exposures and for treating anthrax. As of October 24, investigations in the District of Columbia (DC), Florida, New Jersey, New York City (NYC), Maryland, Pennsylvania, and Virginia have identified 15 (11 confirmed and four suspected) cases of anthrax according to the CDC surveillance case definition. Seven of the 15 cases were inhalational anthrax and eight were cutaneous. **All *MMWR* articles related to anthrax and bioterrorism are now archived at one location. The web address is** <http://www.cdc.gov/mmwr/indexbt.html>.

<http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5041a2.htm> **Recognition of Illness Associated with the Intentional Release of a Biologic Agent**, CDC's *MMWR* October 19, 2001/50(41);893-7 online report which recommended heightened surveillance for any unusual disease occurrence or increased numbers of illnesses that might be associated with the terrorist attacks. Subsequently, cases of anthrax in Florida and New York City have demonstrated the risks associated with intentional release of biologic agents. This report

provides guidance for health-care providers and public health personnel about recognizing illnesses or patterns of illness that might be associated with intentional release of biologic agents. .

<http://appropriations.senate.gov/releases/index.cfm?code=DEM> The **U.S. Senate Appropriations Committee** site was created to provide up-to-date information on committee and subcommittee activities, including hearings, pending and enacted legislation, membership, and more. The site is updated as soon as new information becomes available. The 13 subcommittees of the Appropriations Committee also have their own web sites, accessible through the home page. For example, The Senate Appropriations Subcommittee on **Labor, Health and Human Services, and Education** met on Tuesday, October 23, 2001, to receive testimony from various individuals on the subject of "Assessing the Public Health Response to Recent Anthrax Exposures." Two panels included: The Honorable Dale Watson, Assistant Director for Counter Terrorism, Federal Bureau of Investigation; Jeffrey P. Koplan, Director, Centers for Disease Control; Barbara Hunt, District Health Officer, Washoe County District Health Department, Nevada; and Bob Kramer, President, BioPort Corporation. Other bioterrorism issues are chronicled here.

<http://www.bioterrorism.slu.edu> **St. Louis University's School of Public Health, Center for the Study of Bioterrorism and Emerging Infections (CSB&EI)**, whose mission is "to provide public health and healthcare facilities with the tools needed for preparedness, response, recovery, and mitigation of intentional or naturally occurring outbreaks." The first priority for the CSB&EI is to conduct a needs assessment of healthcare workers. This needs assessment will use qualitative and quantitative research methods to discern the level interest and concern of health care professionals on the subjects of bioterrorism and emerging infections.

<http://www.hopkins-biodefense.org/pages/agents/agentanthrax.html> **Johns Hopkins University Center for Civilian Biodefense Studies.** Approach is to increase

national and international awareness of the medical and public health threats posed by biological weapons, thereby augmenting the potential legal, political and moral prohibitions against their use. Develop a broader appreciation of the scope of the threat posed by the major biological agents and possible medical and public health responses to them through analysis of expected clinical manifestations, available treatment strategies, epidemiology, and potential methods of prophylaxis. Disseminate this knowledge throughout the medical and public health communities. Foster the planning and preparation for response to possible bioterrorist attacks, and by so doing, lessen their potential effectiveness and attractiveness as instruments of terror. Engage the medical and public health communities in comprehensive planning for the epidemiological characterization of the epidemic, for the care and treatment of casualties, for communication of information to the public and for the pursuit of unmet research and preparedness needs.

<http://publichealthgrandrounds.unc.edu/bioterrorism.htm> Public Health Grand Rounds, June 11, 1999.
Bioterrorism: Implications for Public Health, A

Live Interactive Satellite Broadcast. "The use of biological agents to threaten or harm civilians on American soil is no longer a remote possibility. It is very real." The inaugural session of the Public Health Grand Rounds featured presentations and discussions on bioterrorism and its implications for public health practitioners, organizations, and systems. Using actual examples of domestic biological threats and hypothetical scenarios as background, public health leaders explored the potential impact of an act of bioterrorism on public health agencies, and the implications for the public health infrastructure. Handouts and videotape of the program are available. Course faculty included: Jeffrey Koplan, Director, Centers for Disease Control and Prevention; William L. Roper, Dean, School of Public Health, University of North Carolina at Chapel Hill, Scott R. Lillibridge, Director, Office of Bioterrorism Preparedness and Response, National Center for Infectious Diseases, Centers for Disease Control and Prevention; and Hugh Tilson, Clinical Professor, Epidemiology and Health Policy, School of Public Health, University of North Carolina at Chapel Hill

Final thoughts: GIS and Public Health in the Aftermath of Recent Terrorism

Our GIS and public health agenda faces new challenges in the wake of the World Trade Center and Pentagon attacks of September 11, 2001, and continued bioterrorist activities. The CDC has provided guidance for some of the next steps. CDC and state and local health departments will: *continue to enhance public health infrastructure; continue to develop response capacity; provide training in bioterrorism preparedness and response for the public health workforce; and continue to enhance the pharmaceutical stockpile and information systems*. There can be no question about the key supporting role of georeferenced information in this guidance.

CDC's guidance for state and local health departments to continue the public health infrastructure and building of information systems is echoed clearly by our nation's Federal Geographic Data Committee (FGDC). As you read the FGDC position on Homeland Security and GIS (this edition) one theme distinctly emerges: *The FGDC believes it is imperative that the Nation accelerate implementation of the NSDI*. As explained by FGDC, there are gaps in the infrastructure and it is imperative to fill them. The urgency to continue to roll out our National Spatial Data Infrastructure (NSDI) could not be greater. The health and well being of every citizen and community in the U.S. depends on being an integral part of this infrastructure. Geospatial data of good quality and positional accuracy, and well documented, now become one of our most vital capital assets for public health and homeland security. Effective planning for, response to, and management and mitigation of, emergencies, hazards and

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disasters, now depends more than ever on georeferenced information, and its interoperability and sharing through geospatial data standards and GIS tools.

The voice of industry echoes this message. Excerpts from “GIS for Homeland Security” (ESRI White Paper, October 2001) include: *A fundamental component of security is information, and for homeland security this means geographic information...Homeland Security will require managers at all levels of government to develop effective methods to collect, analyze, and share location-based data to do effective planning... [and] The value of building data warehouses for each community as well as obtaining permissions and access to invaluable proprietary data sets cannot be stressed enough. Gathering data to create a GIS to meet potential emergencies requires an immediate and concentrated effort. It is far easier to accomplish this task before an attack or emergency than in its aftermath.*

We will face and overcome new challenges to this mission. For example, uncertainty as to how prudent it is to make available selected national spatial datasets to the public is a new concern. Current response to terrorism by some federal agencies is that georeferenced information on commercial energy producing facilities, nuclear cooling towers, selected transportation networks, surface water intake pipes, air dispersion models, and other GIS databases may be considered potentially “sensitive” to national security. Understandably, the issue of public access to what once constituted routinely available geospatial information will come under review and examination at all levels of government.

But above all we need to keep our focus and determination on the goal e.g., accelerated development of a comprehensive, seamless and interoperable NSDI. U.S. communities not yet empowered with geospatial tools may want to follow the example of Chester County, PA (see special report, this edition) where geospatial information on local surface water intake facilities is GIS ready for effective emergency planning and response. Accelerating the NSDI could not be more timely. Our nation’s future public health and well being depend on it.

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 43rd edition with continuous reporting since 1994. The CDC/ATSDR Public Health GIS Users Group now serves more than 4,000 online professionals worldwide.

Please join us at NCHS on November 27 and 29 for our 14th Annual Celebration of Geography Awareness Week

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