

PUBLIC HEALTH GIS NEWS AND INFORMATION

September 2002 (No. 48)

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



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

2); News from GIS Users (pp.2-8); GIS Outreach (pp.16-19); DHHS and Federal Update (pp.16-19); Thoughts (pp.21-22)

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

September 19, 2002. "XML Web Services and the Enterprise Architecture: Implications for DHHS agencies and Geospatial Data Activities", Brand Niemann, Computer Scientist and XML/P2P/Web Services Specialist, Office of Environmental Information, U.S. Environmental Protection Agency. NCHS Cartography and GIS Guest Lecture Series programs are held, 2:00-3:30PM, at the NCHS Auditorium, RM1100, Hyattsville, MD; They have been presented continuously since 1988. Envision is available to offsite CDC/ATSDR locations; Web access is available to all others at site <http://video.cdc.gov/ramgen/envision/live.rm> (link becomes active approximately 30 minutes prior to the event and viewing requires RealPlayer installation). 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 NCHS GIS website]

- * National States Geographic Information Council (NSGIC) 2002 Annual Conference, September 9-12, 2002, Park City, Utah [See: <http://www.nsgic.org>]
- * Association of State and Territorial Health Officials (ASTHO) 2002 Annual Meeting, "Public Health: The Challenge Continues," September 10-13, 2002, Nashville, TN [See: <http://www.astho.org>]

*National Association of Community Health Centers, Inc. 2002 Annual Convention and Community Health Institute, Hilton New Orleans Riverside Hotel, New Orleans, LA; September 14-17, 2002 [See: <http://www.nachc.com/default.asp>]

*2002 American College of Epidemiology Annual Meeting: "Age, Sex, and Race: Towards a New Understanding for Epidemiology," September 22-24, 2002, Albuquerque, NM [See: <http://www.acepidemiology.org>]

*Second International Conference on Geographic Information Science (GIScience), September 25-28, Boulder, CO [See: www.giscience.org]

* Mapping the News Conference, September 27-29, 2002, Washington, D.C. [See current website at: http://www.esri.com/industries/media/mapping_the_news.html]

*Advancing the Health of Women: Prevention, Practice, and Policy, CDC/ATSDR Office of Women's Health, October 7-9, 2002, Atlanta, GA [See website: <http://www.cdc.gov/od/spotlight/wmconf/index.htm>]

*Federal Committee on Statistical Methodology Statistical Policy Seminar: Challenges to the Federal Statistical System in Fostering Access to Federal Statistics, November 6-7, 2002, Bethesda, MD [See website: <http://www.fcsfm.gov/events/index.html>]

*2002 Annual Meeting of the American Society for

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Information Science and Technology, November 16-21, 2002, Philadelphia, PA [See: <http://www.asis.org>]

* The Sixth Annual International Crime Mapping Research Conference: "Bridging the Gap Between Research and Practice," December 8-11, 2002. Denver, CO [See: <http://www.ojp.usdoj.gov/nij/maps>]

* Second International Workshop on Web and Wireless Geographical Information Systems (W²GIS) 2002, in conjunction with the 3rd International Conference on Web Information Systems Engineering, December 10-12, 2002, Singapore, Singapore [See workshop website at: <http://www.eng.nus.edu.sg/civil/conf/wgis2002>]

* 99th Annual Meeting of the Association of American Geographers, March 4-8, 2003, New Orleans, LA [See: <http://www.aag.org>]

* 2003 GeoTec Event: A Spirit of Collaboration, March 16-19, 2003, Vancouver, British Columbia [See: <http://www.GeoTecEvent.com>]

II. GIS News

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

A. General News and Training Opportunities

1. **New e-Handbook of Statistical Methods Available Online from NIST:** The Commerce Department's National Institute of Standards and Technology (NIST) and International SEMATECH (ISMT) announced today the new NIST/Sematech e-Handbook of Statistical Methods. NIST teamed up with International SEMATECH, a consortium of worldwide major semiconductor companies, to provide this Web-based guide for engineers, scientists, businesses, researchers and teachers who use statistical techniques in their work. The result of their effort is the new e-Handbook which provides modern statistical techniques and updated case studies for engineers and scientists who want to use statistical tools without becoming statisticians themselves. The e-Handbook is now available at

www.nist.gov/stat.handbook. The e-Handbook will be available on CD later this summer.

2. From the **University of Washington School of Public Health and Medicine**: A week-long program entitled "**Bioterrorism and Emergency Public Health Preparedness,**" will be offered by The Northwest Institute for Public Health Practice (formerly UW Summer Institute for Public Health Practice), September 9-13, 2002 (see University Washington website at <http://healthlinks.washington.edu/nwcp/hniphp>). This Fall program will be integrated via case studies around a central theme of bioterrorism (BT) preparedness and response, but much of the training will remain generally applicable to public health practice. [Contact: Nedra Pautler at pautler@u.washington.edu]

3. From **Dunrie Greiling**, TerraSeer: TerraSeer will offer a set of two 1-day short courses in "**Spatial and Temporal Data Analysis Methods and Software.**" This training will occur in Ann Arbor, MI, September 12-13, 2002. These courses are intended for researchers and policymakers who draw conclusions from spatial and temporal data, including epidemiologists, criminologists, urban planners, economists, environmental researchers, and sociologists. This two-day seminar will provide training in analysis techniques and software tools that assist in identifying and understanding the occurrence and likelihood of physical events in geographic space and time. [Contact: Laurie Smith at Smith@TerraSeer.com]

4. From **Lance Waller**, Emory University: A three-day conference entitled "**Spatial Statistics: Integrating Statistics, GIS, and Statistical Graphics,**" to be held October 17-19, 2002, in Seattle, Washington, is being organized by the Statistics and Environment Section of the American Statistical Association (ASA) and the National Research Center for Statistics and the Environment (see <http://www.engr.washington.edu/~uw-epp/gis/reginfo.html>). In addition, there will be a one-day short course on "Integrating Geostatistics and GIS." Papers will be given on recent advances in the analysis and display of environmental spatial data. [Contact: Lance at lwaller@sph.emory.edu]

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B. Department of Health and Human Services

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

5. **Gulf War Medical Research Library** The Departments of Defense, Health and Human Services, and Veterans Affairs have joined together to create this centralized reference library of government-sponsored Gulf War-related medical research (see website at: <http://www.gulflink.osd.mil/medsearch>). This library was developed to help service members, veterans, families, and the public learn about research efforts into **health concerns related to service during the Gulf War**. This web site reflects the federal government's desire to make the results of government-sponsored research available to as many people as possible. Additionally, this web site will provide scientists and others in the medical field the ability to learn about achievements and initiatives in Gulf War-related medical research.

Administration for Children and Families

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

6. The Bush administration will direct HHS to release \$100 million in Low Income Home Energy Assistance Program (LIHEAP) emergency funds for 33 states and the District of Columbia, which have been much hotter than normal this summer. The \$100 million is allocated to the states most affected by the **extreme heat**, based on the severity of the heat wave and the number of low-income households in the state. [See website for state awards and details]

Agency for Healthcare Research and Quality

(www.ahrq.gov)

7. With HCUPnet, a tool for identifying, tracking, analyzing, and comparing statistics on hospitals at the national, regional, and State level, users have easy access to national statistics and trends and selected State statistics about **hospital stays**. HCUPnet guides you step-by-step to obtain the statistics you need. HCUPnet generates statistics using data from the Nationwide Inpatient Sample (NIS), the Kids' Inpatient Database (KID), and the State Inpatient Databases (SID) for States that participate. HCUPnet is part of the Healthcare Cost and Utilization Project (HCUP) of the Agency for Healthcare Research and Quality (AHRQ).

Agency for Toxic Substances and Disease Registry

(<http://www.atsdr.cdc.gov>)

8. **Hazardous Substances & Public Health** is a quarterly newsletter published by the Agency for Toxic Substances and Disease Registry (ATSDR). This issue, Summer 2002:12(2), examines the relationship between diseases and the environment including **asthma, multiple sclerosis, endocrine disruptors, chronic beryllium disease, and disease clusters**, all of which have been linked to the environment.

Centers for Disease Control and Prevention

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

9. **Lina Balluz**, NCDPC: The Behavioral Surveillance Branch, Division of Adult and Community Health, National Center for Disease Control and Prevention, is pleased to announce the release of the **2001 behavioral risk factor data**. The Behavioral Risk Factor Surveillance System (BRFSS) is a unique, State-based surveillance system active in all 50 states, the District of Columbia, Puerto Rico, the Virgin Islands, and Guam. Information on health risk behaviors, clinical preventive health practices, and health care access, primarily related to chronic disease and injury, is obtained from a representative sample of non-institutionalized adults, 18 years and older, in each State.

The BRFSS provides flexible, timely, and ongoing data collection that allows for State-to-State and State-to-nation comparisons. State-specific data, including racial-and-ethnic-specific data from the BRFSS, provide a sound basis for developing and evaluating public health programs, including programs targeted to reduce racial and ethnic disparities in health risks. The BRFSS is the largest telephone-based surveillance system in the world with over 200,000 interviews nationwide per year. The 2001 BRFSS data are located at www.cdc.gov/brfss. It is anticipated that the 2001 BRFSS Summary Prevalence Report will be released within one to two weeks; and also will be accessible through the BRFSS web site. [Contact: Lina at lib7@cdc.gov]

10. From **Irma Arispe**, National Center for Health Statistics (NCHS) and the Academy for Health Services Research and Health Policy are seeking applicants for

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the second cycle of the **NCHS/Academy Health Policy Fellowship**. The Application Deadline is January 10, 2003, and Fellowship Commencement is September, 2003. This program brings visiting scholars in health services research related disciplines to NCHS to collaborate on studies of interest to policymakers and the health services research community using NCHS data systems. [For more information regarding the Fellowship and receive a copy of the Call for Applications visit <http://www.academyhealth.org/nchs/index.htm> or email the Academy at nchs@ahsrhp.org]

11. From **Yvonne Lewis**, Office of Minority Health: IMHOTEP interns presented research projects at CDC on August 8-9, 2002. **IMHOTEP is an eleven-week summer internship program for minority students designed to strengthen their knowledge and skills in epidemiology, biostatistics and occupational safety and health**. The program also serves to increase interest in, and awareness of public health careers. Over the years, IMHOTEP has had a significant impact on the number of minority students accepted for graduate study in these fields. In addition, the program has provided an excellent opportunity for students to gain one-on-one experience and establish lasting relationships with career CDC professionals, without whose dedication and commitment, the summer program would not be possible. [Contact: Yvonne at (404) 639-7220]

Centers for Medicare and Medicaid Services

<http://cms.hhs.gov>

12. The Administrative Simplification provisions of the **Health Insurance Portability and Accountability Act of 1996** (HIPAA, Title II) require the Department of Health and Human Services to establish national standards for electronic health care transactions and national identifiers for providers, health plans, and employers. It also addresses the security and privacy of health data. Adopting these standards will improve the efficiency and effectiveness of the nation's health care system by encouraging the widespread use of electronic data interchange in health care.

Food and Drug Administration

<http://www.fda.gov>

13. **FDA Certified Mammography Facilities** can be identified geographically from the Web. If you click on Search for FDA Certified Mammography Facilities in Your Area, you can access a listing by ZIP Code of all mammography facilities in that ZIP Code certified by the Food and Drug Administration (FDA) as meeting baseline quality standards for equipment, personnel and practices under the Mammography Quality Standards Act of 1992 (MQSA). The effectiveness of mammography as a breast cancer detection technique is directly related to the quality of mammography procedures. In response to concerns that many providers were using mammography procedures of insufficient quality, Congress enacted MQSA. This statute establishes requirements for the accreditation, certification, and inspection of facilities and aims to ensure that all women have access to high-quality mammography services. As a result of this legislation, facilities must be certified to lawfully perform mammography and to be reimbursed by Medicare and Medicaid for mammography services. Certified facilities are listed alphabetically by State and updated weekly. The list provides each facility's name, address, and phone number.

Health Resources and Services Administration

<http://www.hrsa.gov>

14. **HHS Awards \$55.8 Million to 131 Health Centers to Expand Medical Capacity at Existing Sites**: HHS Secretary Tommy G. Thompson today (July 10, 2002) announced 131 grants totaling \$55.8 million to increase access to health care services for Americans in rural and inner-city areas as part of the President's long-term strategy to expand community health centers nationwide. "Today's awards represent a major leap forward in President Bush's plan to increase the number of people served at health centers from about 11 million now to over 16 million by 2006," Secretary Thompson said. "Nearly a half million Americans are expected to benefit from these awards through greater access to comprehensive primary and preventive health services."

Expanding community-based health centers is a key element of the Bush administration's plan to increase access to care for the nation's most medically underserved individuals. Today's grants from the

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Expanded Medical Capacity Initiative are intended to expand primary health care services by increasing a health center's ability to serve more people and improve their health status.

Today's grants are part of the Consolidated Health Center Program, which funds a national network of more than 3,300 community health centers, migrant health centers, health care for the homeless centers, public housing primary care centers and school-based health centers serving more than 11 million low-income patients. America's community health centers, the largest part of the program, received grants to provide services for more than 424,000 people. The other awards include grants to support critical services and outreach for more than 48,000 migrant/seasonal farmworkers and families, more than 20,000 homeless individuals, and 1,500 residents of public housing. The Health Resources and Services Administration (HRSA) oversees the program. [For grant locations see the following website at : <http://newsroom.hrsa.gov/releases/2002releases/EMC.htm>]

Indian Health Service

<http://www.ihs.gov>

15. IHS staff visited the Department of Energy research facility earlier this year. The visit was made to identify ways to collaborate on GIS issues and identify opportunities for collaboration on **environmental health** issues. Oak Ridge has extensive experience, expertise and resources in the use of GIS technology for environmental health, epidemiology, and public health applications. [See: Division of Environmental Health Services Director's Monthly Conference Call Minutes 3/14/2002, key word search GIS]

National Institutes of Health

<http://www.nih.gov>

16. **Treatment Disparities for Lung Cancer Related To Surgical Practices:** An NCI-funded study found that the lower survival rate among African American patients with early-stage, non-small-cell lung cancer, as compared with White patients, is largely explained by the lower rate of treatment through surgery among African Americans. This study of 10,984 patients 65 years of age or older, of whom 860 were African American and 10,124 were non-Hispanic White, showed that: The rate of surgery was

12.7 percentage points lower for African American patients than for White patients (64.0 percent versus 76.7 percent); The 5-year survival rate was also lower for African Americans (26.4 versus 34.1 percent); and, for patients who had surgery, survival was similar for the two racial groups; For patients who did not have surgery, survival was also similar. Study results suggest that increased use of surgery for African American patients would improve survival. [See: **Fiscal Year 2003 Plans & Priorities for Cancer Research** at <http://plan.cancer.gov>]

Substance Abuse and Mental Health Services Administration

<http://www.samhsa.gov>

17. On any given day, approximately 1 million people are receiving treatment for drug or alcohol addiction, according to the **2000 National Survey of Substance Abuse Treatment Services**. This report presents tabular information and highlights from the 2000 National Survey of Substance Abuse Treatment Services (N-SSATS), conducted between October 2000 and April 2001, with a reference date of October 1, 2000. It is the 24th in a series of national surveys designed to collect data on the location, characteristics, and use of alcohol and drug abuse treatment facilities and services throughout the 50 States, the District of Columbia, and other U.S. jurisdictions.

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

[A listing of Historically Black Colleges and Universities (HBCU) may be found at

<http://www.smart.net/~pope/hbcu/hbculist.htm>]

18. From **Linda Adams, NCHS (Paid Health Internships at CDC/ATSDR):** The ASTDHPPHE/CDC (Association of State and Territorial Directors of Health Promotion and Public Health Education/National Center for Chronic Disease Prevention and Health Promotion) Internship Program (see: <http://www.astdhpphe.org/program/index.htm>) aims to provide practical experience to students of minority-serving institutions whose classroom preparation has been dedicated to health education and health promotion

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disciplines. Students are eligible for internship opportunities if they: (1) are enrolled in a health education or health promotion program in an undergraduate or graduate program at four-year college or university designated as a minority-serving institution (e.g., Minority-serving institutions hold federal classifications as Historically Black Colleges and Universities (HBCU), Hispanic-serving Institutions (HSI) or Tribal Serving Institutions (TSI), (2) are US citizens, non-citizen nationals, or foreign nationals possessing a visa permitting permanent residence in the US, and; have decided or are considering a professional career in health education and health promotion. **Benefits:** The Internship Program and its placement process provide a channel for the development of partnerships between public health agencies and minority-serving institutions. The Internship Program is an ideal component of such a partnership in that it provides benefits to each of the three parties involved; the student, the academic program, and the public health agency.

19. From **Lisa MacSpadden**, National Capital Planning Commission (**Advanced Technology Training For Historically Black College and University Faculty**): The National Capital Planning Commission (NCPC) and the Washington Geographic Information System Consortium (WGIS) hosted the Historically Black College and University (HBCU) Summer Faculty Geographic Information System (GIS) Workshop, August 4-10, 2002, in Washington, D.C. Howard University's Continuing Education Program coordinates this annual workshop with the support of federal agencies. Faculty members from HBCUs participated in this year's program. The opening session, to which the public was invited, featured as a keynote speaker Ambassador Leonard Spearman, Executive Director of the White House Initiative on HBCUs. Former President of Texas Southern University and a former envoy to two African countries, Ambassador Spearman discussed ways to close the achievement gap between minority students and their peers. In discussing the GIS workshop, Ambassador Spearman said, "We need to find innovative ways to close the achievement gap that exists among minorities and non-minorities and ensure that African American professionals have the opportunities they need in order to

succeed. This effort in which HBCUs, the federal government, and the private sector are working together to achieve that goal is an excellent move in the right direction." The workshop promotes GIS technology through training sessions conducted by research faculty and federal agency representatives for novice and advanced users.

In addition to the National Capital Planning Commission and Howard University, this year's sponsors included the Department of the Interior's Office of Surface Mining and Bureau of Land Management, the U.S. Army Corps of Engineers, and ESRI, a leading GIS software developer. Patricia Gallagher, Executive Director, NCPC said of the Commission's sponsorship, "We are delighted to be part of a program that ensures that this generation of minority students will be able to enter careers in advanced technology fully prepared. This is precisely the kind of effort that we as government executives need to support." [Further information on the GIS workshop program is available online at the website www.con-ed.howard.edu or www.wgis.org]

20. HHS Secretary Tommy G. Thompson leads HHS's continued progress in the Department-wide focus on **minority health improvement**. Minority health inequalities remain startlingly clear in some areas, however strong efforts are being made to attempt to change this. As it stands, African American men continue to be 26% more likely than white males and twice as likely as Hispanic males to die of heart disease, with 40% of African American heart disease deaths occurring before age 65. Efforts to change this, however, include the CDC's Racial and Ethnic Approaches to Community Health (REACH) community-driven project, and the Closing the Health Gap campaign.

In 2002, the Department of Health and Human Services will spend \$5.7 billion on minority health programs. This is \$261 million more than in 2001, and includes \$158 million in funds for the newly created NIH National Center on Minority Health and Health Disparities. The Office of Minority Health continues the Department's Initiative to Eliminate Racial and Ethnic Disparities in Health. The initiative was first implemented in 1998 to focus on 6 key areas that disproportionately impact minority communities: infant mortality, cancer

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screening and management, cardiovascular disease, diabetes, HIV/AIDS and immunization. [See website at: <http://www.hhs.gov/news/newsletter/weekly>]

21. **Hispanic/Latino Health Initiative:** The **NCID (National Center for Infectious Diseases) Hispanic/Latino Health Initiative** began in 2002 with an examination of NCID work currently under way in Hispanic/Latino populations, and will identify areas for future research, intervention, and policy development (see <http://www.cdc.gov/ncidod/omwh>). In addition, the Hispanic/Latino Health Initiative focuses attention on Hispanic/Latino public health workforce development issues, and supports new and expanded training options. The Hispanic/Latino Health Initiative works with community-based organizations, Hispanic-serving institutions, centers and programs of CDC/ATSDR, and the Association of Latino Employees of CDC/ATSDR (ALECA) in promoting Hispanic/Latino health and well being.

22. From **Bonnie Gallahan**, USGS (**Federal/State/Tribal NSDI Forum**): The Federal Geographic Data Committee (FGDC) is continuing to sponsor Federal/State/Tribal NSDI Forums across the nation. This year's regional forum, August 20-21, 2002, at the Bureau of Land Management State Office in Billings, MT, explored ways to strengthen relationships between Federal, State and Tribal Geographic Information coordinators. This forum is a result of ongoing efforts of the FGDC, NSGIC, USGS and Sinte Gleska University, a tribal academic institution. Metadata training was also offered at the forum. [Contact: Bonnie at bgallahan@usgs.gov]

D. Other Related Agency or Business GIS News

23. From **Sabby Nayar**, MapInfo: **MapInfo Homeland Security and Continuity of Government Grant Program**. MapInfo's grant program assists small to medium-sized municipalities (counties, cities, towns, villages, etc) in the United States to develop and deploy Homeland Security/Continuity of Government Plans and Initiatives (see MapInfo website at following URL: http://www.mapinfo.com/industry/government/homeland_security_grant.cfm). In the current state of heightened

awareness, location-based intelligence (LBI) plays an increasingly critical role in threat management. LBI allows for planning, detection and mitigation of risk, response and recovery. It enables better communication, collaboration and coordination, helping to quickly identify and understand important location issues and, thus, to make more insightful decisions. *Phase 1:* For municipalities with populations of 75,000 or less- Applications will be accepted until **October 31, 2002**; *Phase 2:* For municipalities with populations of 150,000 or less- Applications will be accepted between **Aug. 1 and Oct. 31, 2002**. [Contact: Sabby at sabby_nayar@mapinfo.com]

24. From **Jennifer Harar**, ESRI-Washington DC Regional Office: George Mason University's Center for Biodefense is hosting a two-day seminar entitled **"Bioterrorism: Threat and Defense"** on September 19 and 20, 2002. Featured speaker includes Ken Alibek, Executive Director of the GMU Center and author of *The Hot Zone* [See: www.ocpe.gmu.edu or call (703) 993-8335]

25. From **Joe Francica**, *Directions Magazine*: Directions Magazine has teamed with GISbid.com to provide a new online service to organizations that need to **post projects that require GIS expertise**. GISbid.com™ (see www.GISbid.com) provides a simple and secure venue to link project managers with providers of GIS services. GISbid.com was developed to provide an environment where GIS professionals can openly communicate project needs for the purposes of contracting, subcontracting, and project teaming. RFPs, RFIs and other contracts are posted free of charge. [Contact: Joe at joe.francica@directionsmag.com]

26. From **Ric Skinner**, Baystate Medical Center: The new online **International Journal of Health Geographics** is accepting papers on the application of geographic information systems and science in public health, healthcare, health services, and health resources. This new journal (see <http://www.ij-healthgeographics.com>), published by BioMed Central, proposes to publish original papers and reviews on all aspects of the application of geographic information

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systems and science in public health, healthcare, health services, and health resources. It is an interdisciplinary journal covering a wide, but well-focused range of topics, and is thus expected to attract audiences from many different fields. Authors may include full color maps. M. Nabih Kamel Boulos and Richard Hoskins serve as Editors-in-Chief. [Contact: Ric at ric.skinner@bhs.org]

27. From **Eric Jefferis**, National Institute of Justice: The National Institute of Justice's Crime Mapping Research Center has recently been renamed **NIJ's Mapping and Analysis for Public Safety** (MAPS) program. With this change arrives a new and improved website which can be found at www.ojp.usdoj.gov/nij/maps. For general inquiries, please note the new email address as well: maps@ojp.usdoj.gov. [Contact: Eric at jefferis@ojp.usdoj.gov]

III. GIS Outreach

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

F From **Paul Rooney**, Federal Emergency Management Administration (FEMA): FEMA publishes paper maps showing areas of flood risk that are used for regulatory purposes under the National Flood Insurance Program. We are hoping to transition to a future program where FEMA can publish GIS data depicting the regulatory floodplain information and the GIS data is considered authoritative. FEMA is interested in examples anyone is aware of where GIS data is used as a legally binding depiction of location.

In particular, FEMA's situation is somewhat different than land records where the historical deeds and property descriptions are considered authoritative and therefore in any situation where the deed and a GIS depiction disagree, the deed governs. FEMA has a statutory mandate to identify areas of flood hazard. Therefore, following a hazard analysis and specific due process procedures FEMA creates the official floodplain designations that supersede any previous designations. So there is no requirement for the new digital data to match exactly a previous paper map.

Related to this, any information about the legal/regulatory precedence of various map elements in interpreting locations shown on a map would be

appreciated. FEMA's maps have traditionally been interpreted by reference to the primary physical features shown on the map, roads, railroads, and surface water features. In a GIS environment, it is more desirable to interpret features relative to the coordinate system of the GIS rather than physical features. This allows the use of the data without a base map, such as with precision surveyed coordinates, or with a different base map of equal or higher accuracy. For example, in contract law, handwritten language governs over typewritten or printed language on the contract. Does anyone know of similar rules for maps, such as the coordinate grid, considered to govern over the location of roads? [Contact: Paul at Paul.Rooney@fema.gov]

IV. Public Health GIS Presentations and Literature

NCHS Cartography and GIS Guest Lecture Series September 19, 2002. "XML Web Services and the Enterprise Architecture: Implications for DHHS agencies and Geospatial Data Activities", Brand Niemann, Computer Scientist and XML/P2P/Web Services Specialist, Office of Environmental Information, U.S. Environmental Protection Agency. **Abstract** Topics to be discussed include- Introduction to XML and XML Web Services; Creating Even Better Content from Good Content; Managing Content as Collections and a Network; Web Content Management Tools; Introduction to VoiceXML; and Introduction to GML and Open Web Services for Geospatial Data. [Contact: Brand at niemann.brand@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 **September 2002** edition is currently available at the CDC web site <http://www.cdc.gov/ncidod/EID/index.htm> and has several articles of potential GIS related interest including:

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Public Health Impact of Reemergence of Rabies, New York and Spatial Analysis of Human Granulocytic Ehrlichiosis near Lyme, Connecticut.

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. 51, No. 34- Outbreak of Measles-Venezuela and Colombia, 2001-2002; Immunization Registry Progress-United States, 2002; Progress Toward Poliomyelitis Eradication-Angola, January, 1998-June 2002; West Nile Virus Activity-United States, August 21-28, 2002, and Illinois, January 1-August 27, 2002; Vol. 51, No. RR-12 *Women and Smoking: A Report of the Surgeon General Executive Summary*; Vol. 51, No. 33- Nonfatal Sports- and Recreation-Related Injuries Treated in Emergency Departments-United States, July 2000-June 2001; West Nile Virus Activity-United States, August 15-21, 2002; Vol. 51, Number RR-9- *Hantavirus Pulmonary Syndrome-United States: Updated Recommendations for Risk Reduction*; Vol. 51, Number SS-6- *Chronic Obstructive Pulmonary Disease Surveillance-United States, 1971-2000*; Vol. 51, No. 32- West Nile Virus Activity-United States, August 8-14, 2002, and Mississippi, July 1-August 14, 2002; Notice to Readers: Working with Communities for Environmental Health Satellite Broadcast and Webcast; Notice to Readers: Epidemiology in Action; Vol. 51, No. 31- West Nile Virus Activity-United States, July 31-August 7, 2002, and Louisiana, January 1-August 7, 2002; Human Rabies-California, 2002; Vol. 51, No. SS-5- *Malaria Surveillance-United States, 2000*; Appendix: *Microscopic Procedures for Diagnosing Malaria*; Vol. 51, No. 30- National, State, and Urban Area Vaccination Coverage Levels Among Children Aged 19-35 Months-United States, 2001; Weekly Update: West Nile Virus Activity-United States, July 24-30, 2002; Vol. 51, No. 29- Cigarette Smoking Among Adults-United States, 2000; Weekly Update: West Nile Virus Activity-United States, July 17-23, 2002; Vol. 51, No. 28- Tetanus-Puerto Rico, 2002; Pertussis Deaths-United

States, 2000; Weekly Update: West Nile Virus Activity-United States, July 10-16, 2002; Vol. 51, No. 27- Infant Mortality and Low Birth Weight Among Black and White Infants-United States, 1980-2000; Update: AIDS-United States, 2000; Diagnosis and Reporting of HIV and AIDS in States with HIV/AIDS Surveillance-United States, 1994-2000; Weekly Update: West Nile Virus Activity-United States, July 3-9, 2002; Notice to Readers: Resumption of Routine Schedule for Diphtheria and Tetanus Toxoids and Acellular Pertussis Vaccine and for Measles, Mumps, and Rubella Vaccine; Vol. 51, No. 26- Heat-Related Deaths-Four States, July-August 2001, and United States, 1979-1999; Injuries and Deaths Among Children Left Unattended in or Around Motor Vehicles-United States, July 2000-June 2001; Public Health Dispatch: Certification of Poliomyelitis Eradication-European Region, June 2002.

Journal Articles and Other Submissions

Zip Code Caveat: Bias Due to Spatiotemporal Mismatches Between Zip Codes and US Census-Defined Geographic Areas-The Public Health Disparities Geocoding Project, Krieger N, Waterman P, Chen JT, Soobader MJ, Subramanian SV, Carson R.. *Am J Public Health*, 92(7):1100-2, JULY 2002. Partial Text (for complete text and tables, see website at: <http://www.ajph.org/cgi/content/full/92/7/1100?view=full&pmid=12084688>): Use of Zip Codes in US public health research is on the rise. As of February 2002, 230 articles were indexed by Zip Code in PubMed, all published since 1989. Fifty-two of these articles (23%) involved the use of census derived Zip Code socioeconomic data (e.g., median household income) to investigate the effects of socioeconomic position on specified health outcomes (article citations are available on request from the authors).

To date, discussions regarding the use of Zip Code socioeconomic data for US public health research have focused chiefly on whether Zip Codes' larger population size (average: 30,000) and potentially greater socioeconomic heterogeneity would attenuate estimates of socioeconomic gradients in health detected using Zip Codes in comparison with estimates obtained via census tract (average population: 4,000) or block group (average population: 1,000) socioeconomic data. Unacknowledged

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in the public health literature, however, is the fact that Zip Codes differ from census tracts and block groups in other important ways, including spatiotemporal definition and stability.

Unlike census tracts, defined by the US Bureau of the Census as "small, relatively permanent statistical subdivision[s] of a county . . . designed to be relatively homogeneous with respect to population characteristics, economic status, and living conditions," Zip Codes are "administrative units established by the United States Postal Service . . . for the most efficient delivery of mail, and therefore generally do not respect political or census statistical area boundaries." Spanning in size from a single building or company with a high volume of mail to large areas that cut across states, "carrier routes for one Zip Code may intertwine with those of one or more Zip Codes" such that "this area is more conceptual than geographic."

Distinction between ZCTAs and Zip Codes "Even though the codes may appear the same, the addresses and areas covered by these areas may not be the same. We strongly advise data users who wish to compare 1990 and 2000 data to determine and evaluate any coverage differences that exist before making any comparisons. There are several reasons for this caution: The USPS has extensively modified Zip Codes over the last ten years. Even though a 1990 Zip Code matches a Census 2000 ZCTA code, there is no guarantee that these cover the same geographic area. Also, some Zip Codes in the 1990 data products were discontinued by the USPS, and new Zip Codes were created; ZCTAs and the 1990 data products were discontinued by the USPS, and new Zip Codes were created; ZCTAs and the 1990 census Zip Code areas were delineated using different methodologies and therefore may not have comparable coverage area or size; and the Census 2000 ZCTAs will include some dedicated PO box Zip Codes. All dedicated PO box Zip Codes were excluded as Zip Code areas in 1990. The resulting 1990 areas include data for both PO box Zip Codes and the Zip Codes that provide street or rural route delivery to the surrounding area."

To "overcome the difficulties in precisely defining the land area covered by each Zip Code," the US Census Bureau created a new statistical entity built from census

blocks: the 5-digit Zip Code tabulation area (ZCTA), first used in the 2000 census. Of note, ZCTAs and Zip Codes sharing the same 5-digit code may not necessarily cover the same area (see Table 1 in article), so that Zip Codes obtained via self-report or from addresses in medical records cannot be assumed to correspond to census-defined ZCTAs.

Even before introduction of the ZCTAs, there were 2 types of spatiotemporal discontinuity that could conceivably affect health studies linking Zip Codes to census-derived data: (1) changes in Zip Code delivery routes-and hence in population covered by the affected Zip Code-and (2) discontinuation and addition of Zip Codes in nondecennial years. Between 1997 and 2001 alone, the US Post Office added approximately 390 new Zip Codes nationwide and discontinued 120 (oral communication, Meg Ausman, US Post Office Data Center, February 5, 2002). One implication of these changes is that persons could be correctly geocoded to a Zip Code that did not exist in the preceding decennial census.

Findings from the Public Health Disparities Geocoding Project illustrate the potential problems for health research of spatiotemporal Zip Code-census mismatches, even those dating from before the creation of ZCTAs. This project was designed to assess which area-based socioeconomic measures at which levels of geography (census tract, block group, and Zip Code) are most appropriate for monitoring socioeconomic inequalities in health. Health data from 2 states (Massachusetts and Rhode Island) and the 1990 census were used. Records were geocoded in 1999 by a firm whose accuracy we ascertained to be high (96%), and the firm, following standard practice, returned the most recent geocodes available.

Cancer incidence rates were one of the health outcomes addressed. We found that in Massachusetts (474 Zip Codes listed in the 1990 census), 17 376 (10.4%) of the 166 730 cancer cases occurring during 1987 to 1993 were geocoded to 193 Zip Codes not included in the 1990 census; 15 774 (90.8%) of these 17 376 cases were in one of 30 Zip Codes changed or established after the 1990 census. By contrast, in Rhode Island (70 Zip Codes listed in the 1990 census), only 0.7% (148) of the 19 766 geocoded cancer incidence records were matched to Zip

Codes not included in the 1990 census.

In the case of colon cancer incidence in Massachusetts, moreover, the impact of excluding persons linked to Zip Codes not included in the 1990 census was substantial. Zip Code-level analyses yielded socioeconomic gradients contrary to those observed via data at the tract and block group levels and contrary to those reported in the literature (see Tables 2-4 in article).

Given the growing interest in linking geographic and health data, we urge researchers, when using geocoded records, to pay careful attention to the potential for spatiotemporal mismatches between census derived and Zip Code data as well as to changes in Zip Code boundaries and years in which boundaries were established. Public health projects and programs that use Zip Code data should likewise be alert to potential new issues stemming from the replacement of Zip Codes with ZCTAs in the 2000 census. [See article for references]

Alcohol mortality: a comparison of spatial clustering methods, Hanson CE, Wieczorek Wf. *Soc Sci & Med*, 55 (5): 791-802 SEP 2002. Abstract: The identification of spatial clusters of alcohol mortality can be a key tool in identifying locations that are suffering from alcohol-related problems or are at risk of experiencing those types of problems. This study compares two methods for identifying statistically significant spatial clusters of county-level alcohol mortality rates in New York. One method utilizes a local indicator of spatial association to determine which groups of neighboring counties have rates that are significantly related to each other. The other method is a spatial scan technique that calculates a maximum likelihood ratio of cases relative to the underlying population to identify the group of counties that rejects the null hypothesis of "no clustering". The results show that because each technique bases its cluster detection on its own criteria, different counties are selected by each method. However, the overlap of the selections indicates that the two analytic methods illustrate different elements of the same clusters. Consequently, these spatial analytic techniques are seen as complimentary and are best used in tandem rather than individually. These findings suggest that multiple methods are a preferred approach to identifying clusters of alcohol-related mortality at the county level.

The evolution of e-government among municipalities: Rhetoric or reality?, Moon Mj. *Pub Admin Review*, 62 (4): 424-433 JUL-AUG 2002. Abstract: Information technology has become one of the core elements of managerial reform, and electronic government (e-government) may figure prominently in future governance. This study is designed to examine the rhetoric and reality of e-government at the municipal level. Using data obtained from the 2000 E-government Survey conducted by International City/County Management Association and Public Technologies Inc., the article examines the current state of municipal e-government implementation and assesses its perceptual effectiveness. This study also explores two institutional factors (size and type of government) that contribute to the adoption of e-government among municipalities. Overall, this study concludes that e-government has been adopted by many municipal governments, but it is still at an early stage and has not obtained many of expected outcomes (cost savings, downsizing, etc.) that the rhetoric of e-government has promised. The study suggests there are some widely shared barriers (lack of financial, technical, and personnel capacities) and legal issues (such as privacy) to the progress of municipal e-government. This study also indicates that city size and manager-council government are positively associated with the adoption of a municipal Web site as well as the longevity of the web site.

Does public transit counteract the segregation of carless households? Measuring spatial patterns of accessibility, Grengs J. *Transit Planning, Intermodal Facilities, and Marketing Transpor Res Record*, (1753): 3-10 2001. Abstract: Although local transit agencies struggle to keep pace with low-density urban development, most people who depend on transit continue to live in concentrated clusters at the core of metropolitan regions, becoming more distant to the variety of places they need to access. Standard transit performance measures fail to help local transportation agencies adapt their services to changes in demographics and urban form. Geographic information systems (GIS) provide a method for measuring transit service at the neighborhood scale while accounting for land-use changes. The first

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aim was development of a GIS-based accessibility indicator that is straightforward to calculate, easy to interpret, and flexible enough to use for employment and nonwork travel alike. The second objective was to introduce recent advances in spatial statistics to transportation planners to help them quantitatively assess changes in accessibility patterns over time. A case study is examined of accessibility to supermarkets in Syracuse, New York. The analysis finds that over 7,500 households, representing 12 percent of the city's households, do not have reasonable access to supermarkets. Furthermore, using visual assessment of maps, a spatial database operations, and spatial statistical tests, the study provides statistically significant evidence that poor accessibility is associated both with low-income neighborhoods and with neighborhoods with disproportionately high populations of African Americans.

Titles

-Semantic granularity in ontology-driven geographic information systems, Fonseca F, Egenhofer M, Davis C, Camara G. *Annals of Mathematics and Artificial Intelligence*, 36 (1-2): 121-151 SEP 2002;

-Risk-based analysis of environmental monitoring data: Application to heavy metals in North Carolina surface waters, Preston BL, Shackelford J. *Envir Manage*, 30 (2): 279-293 AUG 2002;

-Exploring geographic information systems, 2nd edition. by Chrisman N, Ashford J. *Journal of Documentation*, 58 (3): 339-342 2002;

-Detection, characterization, and prediction of tick-borne disease foci, Cortinas MR, Guerra MA, Jones CJ, Kitron U. *Intern'l J of Med Microbiology*, 291: 11-20 Suppl. 33 JUN 2002;

-A baseline study of importance of bovines for human *Schistosoma japonicum* infections around Poyang Lake, China: Villages studied and snail sampling strategy, Davis GM, Wu WP, Chen HG, Liu HY, Guo JG, Lin DD, Lu SB, Williams G, Sleigh A, Feng Z, McManus DP. *Am J of Trop Med and Hyg*, 66 (4): 359-371 APR 2002;

-Mapping environmental injustices: Pitfalls and potential of geographic information systems in assessing environmental health and equity,

Maantay J. *Environ Health Persp*, 110: 161-171 Suppl. 2 APR 2002;

-Spatial patterns in benthic biodiversity of Chesapeake Bay, USA (1984-1999): Association with water quality and sediment toxicity, Preston BL. *Envir Tox and Chem*, 21 (1): 151-162 JAN 2002;

-Traffic-related air pollution and respiratory health during the first 2 yrs of life, Gehring U, Cyrus J, Sedlmeir G, Brunekreef B, Bellander T, Fischer P, Bauer CP, Reinhardt D, Wichmann HE, Heinrich J. *Eur Resp J*, 19 (4): 690-698 APR 2002;

-Influence of exposure assessment methods on risk estimates in an epidemiologic study of total trihalomethane exposure and spontaneous abortion, Waller K, Swan SH, Windham SC, Fenster L. *J of Expos Analysis and Envir Epid*, 11 (6): 522-531 NOV-DEC 2001;

-Method of improving pedestrian safety proactively with geographic information systems - Example from a college campus, Schneider RJ, Khattak AJ, Zegeer Cv. *Transport Res Rec* (1769): 20-27 2001

-Geographic information system-based integrated model for analysis and prediction of road accidents, Saccomanno FF, Fu LP, Roy RK. *Transport Res Rec* (1768): 193-202 2001

Other Literature: Special Reports Beyond Mapping:

The Challenges of New Technologies in the Geographic Information Sciences

Workshop of the National Academies Division on Earth and Life Studies, National Research Council, Board on Earth Sciences and Resources, Mapping Science Committee, held August 22, 2002, to examine IT and other technologies that will impact the collection, use, and management of geospatial data and information.

Plan of Action: Proposed Statement of Work

The assessment of the mapping sciences addressed the following questions:

1. How have mapping/geographic information activities evolved and what have been their fundamental underpinnings?

*What are the core disciplines that contribute to the mapping sciences? Non-core, contributing disciplines?

*What new disciplines are emerging?

*In these contexts, what are the gaps among disciplines and how can the geographic information sciences begin to bridge these gaps. e.g. among spatial data applications, natural resource management, the social sciences and relevant disciplines?

2. What is the nature of the research agenda related to the mapping sciences and will these questions (societal and technological issues) be addressed by current and possibly future collaborations amongst many disciplines?

*Society is dependent upon the 7 framework layers of the NSDI (geodetic framework, elevation, imagery, cadastral, transportation, hydrology, boundaries). The development of the NSDI demands collaboration among disciplines and agencies. How can we collaborate in ways that integrate and link these layers into a unified frame that will meet the future needs of society?

*How can research contribute to the NSDI's models of participation?

*How should the private sector, government, and academia participate and cooperate in the research and development of the geographic information sciences?

3. What knowledge and skills will be required for professionals in the mapping sciences in corporations, agencies, and educational institutions?

*How is geographic information science currently addressed by the academic community? What are the positive and negative aspects of variability in academic approaches to incorporating spatial technologies?

*What core competencies will be needed in the workforce over the next 20 years?

*What are the education innovations (e.g., life-long learning, distance leaning) needed to provide and maintain workforce skills in the geographic information sciences?

4. What are the current strengths and weaknesses of the mapping sciences and how successful have they been in responding to technological change?

*What current technologies merit evolution and development?

*What are the significant current and predicted challenges that merit research attention?

*What enabling technologies are necessary to meet these challenges (e.g., How can the interaction of space and ground technologies be facilitated? Should global

positioning technologies be developed in conjunction with satellite technologies?)

5. What is the state of the research infrastructure that supports geographic information science?

*What are the varying roles of the universities, government laboratories, and private sector in supporting geographic information science?

*What changes in the research infrastructure are needed to shape the trajectory of the geographic information sciences to meet the needs of the future?

*How might the evolution of the research infrastructure be influenced to address societal needs?

*What is the best way to disseminate and implement geographic information science research findings into government, private and public use.

A separately appointed panel, working under the aegis of the Mapping Science Committee, will be responsible for the study and its report. The panel will be small enough to act effectively, but large enough to represent a range of backgrounds and roles in the field. A panel of about ten members is anticipated including the following areas of expertise: Geographic Information Sciences (GIS), including photogrammetry and remote sensing; Geography; Information Systems and Government; Information Systems and the Private Sector; Education; Work Force Issues. [See: <http://www.national-academies.org> or contact Kristen Krapf, Study Director, National Research Council, at (202) 334-2744]

Meetings and Announcements

GIS in Public Health and Human Services at URISA's 40th Annual Conference and Exposition

October 26-30, 2002 - Chicago, Illinois

Overview of Selected Sessions.

GIS in Public Health and Human Services. Public Health has embraced GIS as a key tool in its mission. New spatially-enabled applications in human services are indicative of increased scope of GIS in a variety of agencies. In addition, the events since September 11 have highlighted the need for increased interaction and support for Public Health across government levels. **New Challenges in Public Health GIS** (Oct. 28): In the course of protecting public health, the local and state departments of public health can benefit from GIS and other spatial technologies. This session considers the

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spatial data requirements for these technologies in public health and the challenges of enhancing linkages between public health, emergency management and other local, state and federal agencies' spatial data efforts. ***Critical Issues of GIS Mapping in Emergency Response and Public Health-** R Cramer, Digital Data Technologies, Inc., Columbus, OH; S Wallace, Digital Data Technologies, Inc., Columbus, OH; ***A Local Department of Public Health and the Geospatial Data Infrastructure-** MO Ruiz, U of Illinois, Urbana, IL; **GIS in Public Health Surveillance-** R Fiedler, Scientific Technology Corporation, Tucson, AZ

Improving Human Services Through Dynamic Maps and GIS. Social programs are more effective and efficient with appropriate information for planning and analysis. Issues of public transit, optimal portrayal of and planning for service delivery locations, and developing a better understanding of clients can all be addressed through innovative collection and use of spatial data.

***Accessibility to Urban Opportunities via Transit Networks- A GIS Approach-** R Huang, U of Wisconsin-Milwaukee, WI; ***Use Of Spatial Analysis To Explore Child Health Indicators In Urban Areas-** M Barndt, Nonprofit Center of Milwaukee, WI; ***emPowerSD Website Helps San Diegans Locate Self-Sufficiency Resources,** A Weed, County of San Diego Health and Human Services Agency, CA

Urban Neighborhoods and Spatial Analysis- Spatial data informed by local knowledge, collected at an appropriate scale, and enhanced through visualization can greatly aid our ability to better evaluate and improve urban neighborhoods. Studies from a variety of large urban areas illustrate creative methods that will provide information to help improve the quality of urban life.

***GIS and Web-Enabled Analysis of Access to Urban Services and Infrastructure in the Context of Developing Countries,** ZN-Budic, U of Illinois, Champaign, IL; ***Let Maps Tell the Story: Using GIS Technology in the Evaluation of Community-Based Groups;** JSaul, Metis Associates, NY; D Kim, Metis Associates, NY; ***Segregated Spaces and Violence in Chicago,** B Rauch, U of Illinois at Chicago, IL

Disease Modeling and Monitoring (Oct. 29). Surveillance, monitoring and modeling of diseases and

disease agents require an understanding of the spatial variation of the disease, the agent and environmental and social factors that affect them. This session presents results from studies on the spatial and temporal aspects of public health issues. ***4000 Points in a Breast Cancer Study on Cape Cod,** J Gardner, Applied Geographics, Inc., Boston, MA; ***Modeling the Variability of E.coli Using GIS: Implications for Public Health,** S Rabinovici, US Geological Survey, Menlo Park, CA; ***Using GIS to Portray & Monitor the Prevalence of HIV/AIDS in 3 Limpop Districts,** R Pillay, U of the North, Pietresburg, South Africa.

Hazards, Social Justice and Environmental Health (Oct. 30). Urban areas are subjected to a variety of environmental health risks, both natural and man-made. Decision-makers and community members can be more prepared to avoid and address urban environmental issues through improved decision support and data access.

***Building An Online Environmental Information System for the St. Louis Region,** SK Walker, City of St. Louis, MO; J Frank, St. Louis Community Information Network, St. Louis, MO; ***An Interactive GIS Linking Science to Natural Hazard Mitigation Decisions,** L Dinitz, US Geological Survey, Menlo Park, CA; S Rabinovici, US Geological Survey, Menlo Park, CA; ***The Boston Industrial Archeology Mapping Project,** K Kolodziej, Massachusetts Institute of Technology, Boston, MA. [Contact for these and related sessions: Marilyn Ruiz, Clinical Assistant Professor, GIS and Spatial Analysis, at moruiz@uiuc.edu]

Release of Long Island Cancer Study

On August 13, 2002, TerraSeer released a geographic study of breast, lung, and colorectal cancer on Long Island, NY. Geoffrey Jacquez and Dunrie Greiling, used TerraSeer Environmental Insight software to detect spatial patterns in these three cancers and compared these patterns to exposure to air toxics. They found no relationship between air toxics and breast and colorectal cancer, but there was a significant spatial association between exposure to air toxics that are known to cause lung cancer with the pattern of lung cancer cases. This study was commissioned by New York Newsday, a paper with a circulation of 700,000 on Long Island.

This study was prompted by ongoing concern

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over cancer patterns on Long Island. Citizens and public health workers are concerned about two things--whether cancer clusters exist and, if so, what may be causing them. Researchers and activists have been tracking cancer patterns on Long Island for the last decade, as part of the Congressional Long Island Breast Cancer Study \$30 million Project.

Jacquez and Greiling used publicly available data for their study. They downloaded information on cancer diagnoses in ZIP codes in three Long Island counties, Nassau, Queens, and Suffolk Counties, for 1993-1997. These data were made available by the New York State Department of Health Cancer Surveillance Improvement Initiative. They used TerraSeer's ClusterSeer(TM) to identify significant clusters of ZIP codes that had more cancer cases than expected and fewer cancer cases than expected (using the NY State expected values, based on the population and the ages in each ZIP code). Next, they obtained estimates of concentration of known air toxics in 1996 from the EPA National Air Toxics Assessment Program (the earliest year available). They tallied the amount of exposure to air toxics known to be associated with each cancer, then they multiplied the exposure by the EPA's assessment of how many excess cancers might come from that exposure, to obtain an overall predicted risk for each cancer based on exposure to air toxics. They used TerraSeer's BoundarySeer® software to identify boundaries in cancer and predicted risk, and then tested whether those boundaries overlapped significantly. There was no significant overlap between breast cancer boundaries and predicted risk from air toxics known to be associated with breast cancer. The pattern for colorectal cancer was similar--no relationship. For lung cancer, however, there was significant spatial association between lung cancer and predicted risk from air toxics.

While suggestive, this analysis does not demonstrate a causal link between air toxics and lung cancer. They did not control for several important variables, such as smoking prevalence or demographic factors. The next steps would be to incorporate a geographic approach alongside these social factors in a larger study. This geographic analysis has identified areas for further study--areas where cancer rates and/or exposure are changing rapidly, which may provide insight

into mechanisms and causes. [Contact: Dunrie Greiling at dunrie@terraseer.com]

CrimeStat II is Available

The National Institute of Justice (NIJ) Mapping and Analysis for Public Safety program is pleased to announce the availability of an improved version of the *CrimeStat* spatial statistics program. The program was developed by Ned Levine & Associates of Houston, TX under a research grant. *CrimeStat II* is Windows-based and interfaces with most desktop GIS programs. The program provides statistical tools for law enforcement agencies and criminal justice researchers in their crime mapping efforts. However, it can also be used for a variety of other applications for which public health analysts and researchers would be interested. It is being used by many analysts and researchers in the United States and throughout the world, including those in public health.

CrimeStat has a collection of statistical tools for the analysis of point/incident locations and includes a range of diagnostic and modeling spatial statistics, including statistics for measuring spatial distribution, for examining distances between incident locations, for detecting hot spots, for interpolating one-variable and two-variable density surfaces, and for analyzing space-time interactions.

The program inputs incident locations in 'dbf', 'shp', ASCII, or ODBC formats using either spherical or projected coordinates. It calculates various spatial statistics and writes graphical objects to ArcView®, ArcGIS®, MapInfo®, Atlas*GIS™, Surfer® for Windows, and ArcView Spatial Analyst®. Version 2.0 includes many improvements to the functionality of the program including ODBC access, the ability to save parameters and alternative reference files, the output of Monte Carlo simulation data, and an improved help menu that is linked to the manual.

New statistical routines include the mode, fuzzy mode, the Spatial and Temporal Analysis of Crime module (STAC), a risk-adjusted nearest neighbor clustering routine, the Knox index, the Mantel index, and a Correlated Walk Analysis module. Many of the existing routines from version 1.1 have been improved. Six of the statistical routines also have a Monte Carlo simulation to

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approximate confidence intervals around the calculated statistic.

Among the many public health applications for which *CrimeStat* would be useful is in detecting spatial changes in medical coverage by time period (e.g., shifts in the pattern of treatment of a particular disease over time), in identifying concentrations of incidents within small areas (e.g., the location of motor vehicle crashes involving fatalities or injuries), in assessing where disease incidents cluster relative to a baseline population (e.g., tuberculosis cases), in identifying time sensitive hot spots (e.g., an emerging infection), in estimating the likely origin of a disease outbreak, and in predicting the likely time and location for a next incident for an emerging infectious agent.

CrimeStat is accompanied by three sample data sets and a manual that gives the background behind the statistics and examples. The current manual includes examples of diverse applications of *CrimeStat* by other researchers, including some in public health. The program and sample data sets are in Windows-based zipped files that can be downloaded. The manual is a set of individual files in 'pdf' format that can also be downloaded. The program, the manual, and sample data sets can be downloaded from the NIJ archivist at: <http://www.icpsr.umich.edu/nacjd/crimestat.html>. [Contact: Ned Levine, Ned Levine and Associates at ned@nedlevine.com; Technical note from Ned in response to ArcGIS 8.x compatibility question: ArcGIS 8.x can read shape files created by CrimeStat II. There should be no problem. However, the shape files produced by the older versions (1.0 and 1.1) are not readable by ArcGIS 8.x; in fact, they will crash that program. Anyone wishing to use the ArcGIS framework should upgrade to CrimeStat version 2]

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

Department of Health and Human Services (HHS) Strategic Plan (Draft) Fiscal Years 2003 - 2008

<http://aspe.hhs.gov/hhsplan/draft>

[Note: [Invitation to Comment](#). Recommendations are invited for improving the Department plan. Currently, the draft contains 8 goals and 40 objectives, and implementation strategies for accomplishing the objectives. Particular interest exists in hearing whether HHS has successfully identified the most important health and human service

priorities that need to be addressed over the next six years and whether proposed implementation strategies are adequate for the task of achieving these strategic goals and objectives. Comments or questions can be sent to the HHS Strategic Plan Team by September 9, 2002, at strategicplan@hhs.gov]

EXECUTIVE SUMMARY

Eight (8) strategic goals [and 40 objectives] have been established for accomplishing the Department of Health and Human Services (HHS) mission to protect and improve the health and well-being of the American public. These goals and accompanying objectives provide the focus for HHS investments of effort and resources over the next five years. The following summary highlights the key priorities of the Secretary that are found in the plan:

To PREVENT DISEASE AND ILLNESS, Goal 1 is to “reduce the major threats to the health and well-being of Americans.” To achieve our goal, we will focus on the behavioral and environmental threats that have a significant effect on health. We especially will focus on:

- promoting healthy behaviors, such as regular exercise and a healthy diet to reduce obesity and the incidence of chronic diseases, such as diabetes;
- increasing abstinence education for young Americans and providing educational and other materials aimed at reducing unsafe sexual behaviors and preventing unintended pregnancies; and
- reducing substance abuse by expanding and improving communities’ substance abuse prevention and treatment programs.

To PROTECT OUR HOMELAND, Goal 2 is to “enhance the ability of the Nation’s health care system to effectively respond to bioterrorism and other public health challenges.” To achieve this goal we will focus our efforts on:

- building the capacity of the health care system to prepare for and respond to public health threats, especially bioterrorism; and
- Initiating steps to ensure the safety of food, drugs, biological products, and medical devices.

To CLOSE THE GAPS IN HEALTH CARE, Goal 3 is to “increase the percentage of the Nation’s children and adults who have access to regular health care and expand consumer choices.” To achieve our goal, we plan to undertake a multi-faceted approach that includes:

- creating new, affordable health insurance options;

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- expanding the health care safety net, especially in underserved rural and urban areas and for low income persons; and

- expanding the availability of health services for populations with special needs, such as those needing organ and tissue transplantations, persons with HIV/AIDS, and persons with mental illnesses.

To IMPROVE HEALTH SCIENCE, Goal 4 is to “enhance the capacity and productivity of the Nation’s health science research enterprise.” To achieve this goal we will concentrate on:

- making investments that advance the understanding of basic biomedical and behavioral science and how to prevent, diagnose, and treat disease and disability; and
- accelerating the development of new drugs, medical technology, and biologic therapies.

To REALIZE THE POSSIBILITIES OF 21st CENTURY HEALTH CARE, Goal 5 is to “improve the quality of health care services.” For this goal, we will especially focus on:

- steps to reduce medical errors and improve consumer and patient protections; and
- accelerating the development and use of an electronic health information infrastructure.

To WORK TOWARD INDEPENDENCE, Goal 6 is to “improve the economic and social well-being of individuals, families, and communities, especially those most in need.” Our efforts will concentrate on:

- engaging all welfare families in work leading to self sufficiency;
- reducing barriers to independent living for persons with disabilities; and
- expanding community and faith-based partnerships to find more creative and effective ways of delivering human services.

To LEAVE NO CHILD BEHIND, Goal 7 is to “improve the stability and healthy development of our Nation’s children and youth.” In achieving this goal we will focus on:

- promoting family formation and healthy marriages; and
- instituting creative and innovate ways to improve the learning readiness of preschool children.

To IMPROVE DEPARTMENT MANAGEMENT, Goal 8 is to “achieve excellence in management practices.” To help us achieve the above seven program

objectives, we will institute a multi-pronged approach to improve management practices and achieve excellence by focusing on the key areas in the President’s Management Agenda. For example, management reforms will center on:

- creating a unified “One HHS”
- improving workforce planning and financial management;
- enhancing the efficiency and effectiveness of competitive sourcing; and
- enhancing the use of electronic commerce.

The Department: “One HHS”

The over-arching central direction of the Department is to function as a single entity- as *One HHS*. To ensure that HHS is “One Department” rather than a collection of disparate and unrelated agencies, we have taken a number of actions, and are planning more. We are reforming the management of the Department and improving the programs that our Department runs. Over the next few years we will be increasingly collaborating and coordinating significant activities among HHS agencies, such as work on HIV/AIDS, Medicare, Medicaid, delivery of health care services to children and families, privacy and confidentiality policies, and research on the effectiveness of HHS programs.

For the first time ever, the HHS Strategic Plan contains a Management Improvement Goal, including strategies to reduce the number of personnel offices; modernize and improve human, financial, and technological management at HHS; and reform regulations to reduce excessive paperwork and burden to doctors and hospitals. To provide accountability, as well as feedback and tracking of how we are doing, we are instituting performance contracts (tied to the strategic goals and objectives) for the Department’s senior leadership which will cascade throughout the Department. This performance contract will institute explicit standards against which HHS officials’ work will be measured.

In terms of our structure, the Department of Health and Human Services (HHS) is one of the largest federal departments, the Nation’s largest health insurer, and the largest grant-making agency in the United States federal government. The Department promotes and protects the health and well-being of all Americans and provides world leadership in biomedical and public health

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sciences. As indicated above, in doing this, HHS is committed to becoming a unified Department. HHS will be accomplishing its objectives through an array of programs in basic and applied science, public health, income support, child development, and the financing and regulation of health and social services. The Department manages this broad range of activities in collaboration with its state, local, tribal, and non-governmental partners, and with the coordination of the staff agencies in the Office of the Secretary. [We welcome your constructive feedback on the plan by September 9, 2002. Your comments will inform the development of a final plan that will be sent to Congress. Bobby P. Jindal, Assistant Secretary for Planning, and Evaluation, HHS]

August 2002 Report on Legislative Activities National Center for Health Statistics, Office of Planning, Budget and Legislation

http://inside.nchs.cdc.gov/opbl/Legislation/RecentHillAct.htm#_Toc18132644

BIOTERRORISM (Excerpts): In June, the president signed into law (P.L. 107-188), an anti-bioterrorism bill. This law provides the policy parameters to go along with funds appropriated to fight bioterrorism. It authorizes funding for activities to enhance preparation for public health emergencies including funding for grants to enhance state and local preparedness and anti-bioterrorism capability. It also expands the national stockpile of medical vaccines and supplies, and authorizes funds to upgrade CDC equipment and facilities, to increase food inspections, to protect the water supply, and to conduct research on anti-microbial resistant pathogens.

The Administration's proposal for a Department of Homeland Security addresses bioterrorism as well, proposing to move to the new Department some NIH and CDC research activities, management of the national pharmaceutical stockpile, and Department level disaster response responsibilities. In House action, the proposed transfer of research activities was scaled back. Even if research activities were to be transferred, there is strong support for contracting back this responsibility to the Department, while maintaining budget control in Homeland Security. Further action on this bill will take place in September.

OTHER HEALTH PROMOTION ISSUES

(Excerpts): Bills have been introduced in both the Senate (S. 2054) and the House (H.R. 4061) to establish state networks and a national network for tracking of chronic diseases including environmental risk factors. There are minor differences between the two bills. Both call for pilot projects, a commission on nationwide health tracking, and funding beginning in FY 2005 for grants to states to establish state tracking networks. States could use their grant funds to (among other things) "collect data through bio-monitoring and other advanced methods." The bills call for use of existing systems and surveys to the maximum extent practicable. The bills also provide for a nationwide health tracking network, again emphasizing use of existing data sources including NHANES, and require the expansion of bio-monitoring data collected by CDC such that data will be available at the census tract or other appropriate level on a range of environmental exposures including prenatal exposures. The bills require the Secretary to issue an annual tracking report beginning four years after enactment. The Senate Health, Education, Labor, and Pensions Committee may act on this bill after the August recess.

PRIVACY AND CONFIDENTIALITY (excerpts): A bill (H.R. 5215) on data sharing among statistical agencies, drafted by OMB and the statistical agencies, was introduced by Rep. Horn (R-CA) just before the August recess. This issue has been of interest to the statistical community for years and bills have been proposed in the past but not enacted. The latest bill would allow for limited data sharing as well as provide minimum confidentiality protections for all data collected by the federal government for statistical purposes. It would permit data sharing among the economic statistical agencies -BLS, Census, and BEA- for statistical purposes. The bill would also provide for the use of "agents," subject to the same confidentiality requirements as employees, to perform statistical activities. For several years NCHS has sought (unsuccessfully) a change to our legislative authority to allow us to designate agents to conduct statistical activities subject to our confidentiality authority. [Report author and contact: Kathy Moss, NCHS, at kgm0@cdc.gov]

Federal Geographic Data Committee (FGDC)

[The Federal Geographic Data Committee (FGDC) is an interagency

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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, including HHS, are developing the NSDI in cooperation with organizations from state, local and tribal governments, the academic community, and the private sector. See <http://www.fgdc.gov>]

Circular No. A-16 Revised

August 19, 2002

http://www.whitehouse.gov/omb/circulars/a016/a016_rev.html

Coordination of Geographic Information and Related Spatial Data Activities

Subject: **This Circular provides direction for federal agencies that produce, maintain or use spatial data either directly or indirectly in the fulfillment of their mission.** This revised Circular provides for improvements in coordination and use of spatial data. Spatial data refers to information about places or geography, and has traditionally been shown on maps. This Circular describes the effective and economical use and management of spatial data assets in the digital environment for the benefit of the government and the nation. The Circular affirms and describes the National Spatial Data Infrastructure (NSDI) as the technology, policies, standards, human resources, and related activities necessary to acquire, process, distribute, use, maintain, and preserve spatial data. The Circular describes the management and reporting requirements of Federal agencies in the acquisition, maintenance, distribution, use, and preservation of spatial data by the Federal Government. The Circular establishes the FGDC as the interagency coordinating body for NSDI-related activities, chaired by the Secretary of the Interior with the Deputy Director for Management, Office of Management and Budget (OMB) as Vice-Chair. This revised Circular supersedes Circular No. A-16 dated October 19, 1990, and incorporates Executive Order 12906. It will remain in effect until replaced pursuant to section 8.e.(j) of this Circular.

Web Site(s) of Interest for this Edition

<http://www.epa.gov/wtc> The **cleanup of residual dust**

and debris from building rooftops, facades and canopies is under way. The work, being done by New York City Department of Environmental Protection (NYCDEP) contractors, follows a visual survey of



approximately 400 buildings surrounding the World Trade Center (WTC) site. Of these, some 250 were found to have residual dust and debris needing removal. The owners of 20 percent of these buildings agreed to do the cleaning themselves, leaving about 200 buildings for the city to clean. The work is being done to prevent resuspension of WTC dust in the air. Lower Manhattan residents can request cleaning and/or testing of their homes from the U.S. Environmental Protection Agency (EPA).

<http://www3.cancer.gov/prevention/bb/satscan.html>

Updated URL for SaTScan. The **SaTScan v2.1 software analyzes spatial, temporal and space-time point data using the spatial, temporal, or space-time scan statistic.** It is designed for any of the following interrelated purposes: To evaluate reported spatial or space-time disease clusters, to see if they are statistically significant; To test whether a disease is randomly distributed over space or over time or over space and time; and, To perform geographical surveillance of disease, to detect areas of significantly high or low rates. Revised memory estimates will be provided in the help files for SaTScan v3.0, when that version is released in the future, and have more efficient use of memory.

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http://cindi.usgs.gov/hazard/event/west_nile/west_nile.html The CDC is working with USGS, USDA Animal and Plant Health Inspection Service, state wildlife agencies, and state and local health and vector control agencies to **track the occurrence of West Nile Virus (WNV)**. The resulting data now are available to the public via a series of multilayer national and state maps.

<http://geomac.usgs.gov> GeoMac represents a multiagency effort to provide **real-time data on wildfires**. The site is maintained on a USGS server. It allows visitors to zoom in to view maps for individual fires and to select features (roads, bodies of water, etc.). Fire perimeter data for the maps are updated daily and are based on information from sources such as Global Positioning System data and infrared imagery.

<http://geode.usgs.gov> GEODE (Geo-Data Explorer) is a U.S. Geological Survey Application for Data Retrieval, Display, and Analysis through the Internet. It provides **digital geographically referenced data to the desktop computers of any user**, including policymaker, land and resource managers, educators, industries, and private citizens. The ultimate goal of GEODE is to provide diverse users a gateway (data portal) that will supply real-time data and analysis over the Internet without the need for special hardware, software or training. There is both a Java and an HTML client version.

www.terrafly.com TerraFly: **A Web-enabled Application for Visualization and Manipulation of Remotely Sensed Data**. Prepare for a virtual flight over your neighborhood. You can see aerial photography over most areas of the United States by filling in the address, or the city and state, or the ZIP Code of the area you would like to see, and clicking the "fly" button. The Aerial Photography that you see over the United States was acquired within the last 5-7 years, and varies depending on what state you are flying over.

<http://www.cdc.gov/cancer/ncccp/guidelines/index.htm> **Guidance for Comprehensive Cancer Control Planning Volume 1: Guidelines**. This document presents **guidelines** for developing a comprehensive cancer control (CCC) plan that can be both implemented and evaluated. The information contained in this document is based on the experiences of several states that undertook a comprehensive cancer control planning process in recent years. These states, called "model planning states," included four that had participated in comprehensive cancer control case studies in 1997 and 1998 (Arkansas, Illinois, Maine, and Utah) and two additional states (Kansas and Kentucky). Each of the model planning states worked with a CDC program consultant and a Battelle Centers for Public Health Research and Evaluation (CPHRE) liaison to go through a planning process to develop a comprehensive cancer control plan.

<http://arcobjectsonline.esri.com> Online Developer samples for **Clustering Engine, Cluster Analysis Tool, Correlation, and Scatterplot** have recently been posted at this site. For more details, go to Samples folder (on left hand side of page), then go to the Analysis and Visualization folder.

<http://www.cdc.gov/ncipc/maps/default.htm> Injury Maps, NCIPC's (National Center for Injury Prevention and Control, CDC) interactive mapping system, gives you access to the geographic distribution of injury-related mortality rates in the the United States. Injury Maps allows you to create county-level and state-level maps of age-adjusted mortality rates for the entire United States and for individual states.

<http://stats.ma.ic.ac.uk/~ngb30> Imperial College. Extensive collection of Spatial Epidemiology coursework: lectures and statistical and software links.

Final Thoughts

Emerging Lessons from GIS Study of Cancer on Long Island

Our field of GIS and public health is beginning to receive some important feedback from GIS exploratory research into cancer clusters and potential environmental relationships and other associative evidence of cancers on Long Island, New York. As you read more thoroughly from the my Final Thoughts sources a picture will emerge that reveals what many of us originally suspected: this is a complex task but one that, at the minimum, will provide lessons for learning more about the subtleties of studying long-term or chronic disease conditions with GIS. Lessons are beginning to be evidenced which is a positive development for GIScience.

Not all of the news on the Long Island Breast Cancer Study is positive. *Newsday*, Inc. (*Newsday*) has dedicated extensive examination and review to the Long Island study. The first three segments were published beginning July 28, 2002, and the final three segments began on Aug. 11, 2002. These include: **Part I- What Went Wrong- Tattered Hopes:** A \$30-Million Federal Study of Breast Cancer and Pollution on LI has Disappointed Activists and Scientists; **Part II-Study In Frustration-** So Many Things Went Wrong: Costly search for links between pollution and breast cancer was hobbled from the start, critics say; **Part III- Still Searching:** A computer mapping system was supposed to help unearth information about breast cancer and the environment; **Part IV- Prescription for Failure:** Poorly designed, superficial studies means the state can't answer key questions about cancer clusters on Long Island; **Part V- Flaws in the System:** The Anatomy of a Cancer Cluster Probe: 'Why Can't Anyone Figure Out What's Going On?'; and, **Part VI-New Approaches in Cluster Hunting.** New Computer-Aided Methods May Help Researchers Identify the Hidden Causes of Cancer Clusters. These appear to be well-researched articles and include many other links to cancer-related sites and issues. The lessons reported on by *Newsday* are not trivial. [See: <http://www.newsday.com/ny-canceronlongisland0728.html>story]

Newsday also requested colleague and friend Geoffrey Jacquez, and his associate Dunrie Greiling, of Michigan-based TerraSeer Inc., use cutting-edge statistical techniques to search Long Island and Queens for clusters of three of the most common types of cancer: breast, lung and colorectal. The abbreviated announcement of their findings is reported in this edition of *Public Health GIS News and Information* (see Section IV). The contents of the full report, "The Geographic Distribution of Breast, Lung and Colorectal Cancer in Long Island, New York," includes: 1. Background, Statement of Purpose, Data and Methods: a) Health-environment relationships, b) Geographic Pattern Analysis, Value questions, Change questions, Association questions, c) Data, Cancer Incidence, National Air Toxics Assessment, and d) Methods; 2. Results: Colorectal Cancer, Colorectal Cancer Incidence- Local Cluster Analysis, Colorectal Cancer -Boundary Analysis -Colorectal Cancer- Analysis of NATA Data; 3. Results: Breast Cancer, Breast Cancer-Local Cluster Analysis, Breast Cancer-Boundary Analysis, Breast Cancer-Analysis of NATA Data; 4. Results- Lung Cancer, Lung Cancer-Local Cluster Analysis, Lung Cancer-Boundary Analysis, Lung Cancer-Analysis of NATA Data; 5. Results-All Cancers: Colorectal, Breast and Lung Cancer-Multivariate Clusters; and 6. Comparison to Prior Studies. There are concluding sections on Interpretation and Caveats, Acknowledgements and References. [See full report at www.terraseer.com/casestudies/longisland]

There are many lessons for us conveyed in the TerraSeer study. These range from the difficulty of establishing or demonstrating causal relationships e.g., the existence of a geographic association is not sufficient to demonstrate causality, particularly given the latency of cancer and the time span of the available environmental data; that the evaluation of geographic clusters must include consideration of potentially misleading aspects of ecologic studies e.g., ZIP codes and census tracts are a coarse spatial unit for aggregating cancer cases and for estimating individual exposure to air toxics; privacy concerns for the patients and the limitations on existing environmental data; the ZIP code

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of residence at diagnosis is an inadequate descriptor of an individual's location during the development of cancer e.g., using the ZIP code of residence assumes the patient lived within that ZIP code area during the period of time required to develop cancer following exposure to an environmental compound that influenced cancer risk; the use of residence as a surrogate for exposure clearly is invalid whenever causative exposures largely occur outside of the home; the study accounted for age but ignored other confounders and covariates such as socioeconomic status, occupation, risk behaviors (such as smoking and diet) and ethnicity. No attempt was made to account for genetic predispositions to cancer; the use of a national-scale assessment to predict cancer risk based on EPA air toxics Unit Risk Estimates (see USEPA National Air Toxics Assessment at www.epa.gov/ttn/atw/nata) is subject to major areas of variability and uncertainty; sample size considerations; and other significant issues.

One of the important findings pertains to our ongoing efforts to better define and determine clusters. The recommendation by TerraSeer Inc. is to bring a variety of methods to bear upon the analysis. Each method has its own unique characteristics such as Martin Kulldorff's Scan Statistic (detecting clusters within circular shapes), used by the New York State Health Department (see maps at www.health.state.ny.us), and TerraSeer's own five spatial-statistical tests (designed to find clusters of any shape, including global and multivariate boundary analysis, and the local Moran test, Monte Carlo significance testing and Bonferroni adjustments). The idea is that using a variety of different cluster techniques can help point to a consensus of clustering both in space and time.

There is much information to digest from this early look at procedures and findings of the Long Island Breast Cancer Study. It is an exciting chapter for all of us in GIS and public health. It helps define currently many of the realities to be expected in the GIS study of chronic or long-term disease. While the *Newsday* articles reveal many of these realities, including political and financial, it appears GIScience is gaining positively in terms of the lessons learned. The combination of spatial and space-time analytic methods, especially those employed by Kulldorff and Jacquez to help assess cancer clustering within the privacy constraints of ZIP Codes, appear to be notable and scientifically sound in addressing this challenge. Moving into the area of causality is another and more elusive challenge but one that in the future will be made more achievable now that limitations to these potential associations have been identified.



Recipient of the “2002 NCHS Director's Award for Equal Employment Opportunity and Civil Rights Program Activities”

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

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