

PUBLIC HEALTH GIS NEWS AND INFORMATION

September 1999 (No. 30)

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

Selected Contents: Events Calendar (p. 1); (p. 6); Special Reports (pp. 6-10); GIS Update (pp.13-19); Website(s) of Interest



News from GIS Users (pp. 1-6); GIS Outreach Lectures (pp. 10-13); DHHS and Federal (pp.19-20); Final Thoughts (pp.20-21)

I. Public Health GIS (and related) Events Calendar

SPECIAL CDC/ATSDR GIS LECTURES: (1) **"The Use of a Spatial Statistics Package for GIS Analysis in Public Health Applications"** by Ned Levine, Ned Levine and Associates, Annandale, VA, **September 16**, 1999, 2:00-3:15 P.M., at the NCHS Auditorium, Hyattsville, MD; and (2) **"The Historical Black Colleges and Universities (HBCUs) GIS Summer Faculty Workshop"** by Cynthia Warrick, Howard University and Lee De Cola, US Geological Survey, **October 21**, 1999, 2:00-3:15 P.M., also at the NCHS Auditorium (Envision is available to offsite CDC/ATSDR locations for these lectures). Abstracts are included in this edition. These talks are sponsored by the CDC/ATSDR Behavioral and Social Science Working Group, the CDC Statistical Advisory Group, and the NCHS Cartography and GIS Guest Lecture Series. [Contact: Chuck Croner at e-mail cmc2@cdc.gov]

☛ Pecora14/The Land Satellite Information III Conference, "Demonstrating the Value of Remote Sensing," American Society for Photogrammetry and Remote Sensing (ASPRS), December 6-10, 1999, Denver, CO [Contact: ASPRS at voice (301) 493-0290 or visit <http://www.asprs.org/asprs>]

☛ Second International Conference on Geospatial Information in Agriculture and Forestry, ERIM International, January 10-12, 2000, Orlando, FL [Visit: ERIM at <http://www.irim-int.com/conf/conf.html>]

☛ Partnerships for Health in the New Millennium: Launching Healthy People 2010, January 24-28, 2000,

Washington, DC [Visit: <http://www.health.gov/partnerships>]

☛ 4th Circumpolar Ecosystems Conference and Workshop, Churchill Northern Studies Centre, February 16-21, 2000, Churchill, Manitoba, Canada [Contact: P. Scott at e-mail pascott@interhop.net or www.brandonu.ca/cnsc/]

☛ 2nd International Health Geographics Conference, March 17-19, 2000, Chevy Chase, MD [Contact: Ric Skinner at voice (609) 588-3500 or e-mail wskinner@fast.net, or Omar A. Khan at e-mail okhan@jhsph.edu; see announcement this edition]

II. News from GIS USERS

(Please communicate directly with colleagues on any issues)

A. General News (and Training Opportunities)

1. From **Dawn Wright**, Oregon State University: All UCGIS member institutions and affiliates have been invited to join ESRI, the National Geographic Society, and the Association of American Geographers in participating in GIS Day on November 19, 1999 (see <http://www.gisday.com>). GIS Day is a GLOBAL, grassroots event that facilitates the practice of GIS users and vendors opening their doors to schools, businesses, and the general public in order to showcase real-world applications of this important technology. GIS Day will be held November 19, the last day of Geography Awareness Week. Since 1987, the National Geographic Society has sponsored Geography Awareness Week to promote geographic literacy in schools, communities, and organizations, with a focus

on the education of children. Geography Awareness Week will be held November 15-19, 1999.

Also, Mike Phoenix of ESRI has recently placed online a searchable database of GIS education programs. It is brand new with only a few entries, but any school or department may enter their own information. The purpose of the database is to have a place online where students or potential students may search for educational programs to meet their needs. ESRI invites UCGIS institutions to enter information about their programs, and to test the search capabilities and make recommendations to ESRI as to how to improve the site. There are still a few problems that ESRI is trying to iron out, but they need more people to use and test their database at <http://andes.esri.com/university/onlinedb.cfm>, which can also be found in the "Education" portion of the UCGIS web site. [Contact: Dawn, Associate Professor, Department of Geosciences, at voice (541) 737-1229 or e-mail <http://dusk.geo.orst.edu>]

2. From **Rose Maria Li**, NIH: The Behavioral and Social Research group at NIH sponsored the presentation "Geographic Variation in Medicare Expenditures and the Relationship to Health Outcomes" on July 30, 1999. Dr. Jonathan Skinner (Economics Department, Dartmouth) and Dr. John Wennberg (Center for Evaluative Clinical Sciences, Dartmouth) presented findings from their recent work on geographic variation in Medicare expenditures and the relationship to health outcomes. [Contact: Rose Maria at the National Institute on Aging, NIH, at voice (301) 496-3138]

3. From **David Parrish**, EPA: EPA's Office of Research & Development (ORD) in Cincinnati is holding a conference on Environmental Problem Solving with GIS on September 22-24 in Cincinnati. The meeting is being organized by the National Risk Management Laboratory. The website with the meeting schedule is <http://www.epa.gov/ttbnrml/gis.htm>. [Source: David at e-mail parrish.david@epamail.epa.gov]

4. From **Ric Skinner**, New Jersey Dept. of Health and Senior Services (International Health Geographics

Conference 2000): We are pleased to announce the second International Health Geographics Conference (IHGC 2K). IHGC 2K will bring together people from many different disciplines who share a common foundation: the geographic aspects of health. This year, one of the primary areas of focus will be spatial statistics. The program of the overall meeting will be unrestricted within the domain of GIS and health; we seek to continue the international dialogue and shared learning in the first IHGC through the presentation and discussion of high-quality research and applications. There are a variety of disciplines already identified to lead us towards this aim; case examples from managed care/insurance, epidemiology, demography, environmental health, infrastructure/facilities management, emergency systems, medicine, Web-based GIS, community health status and others will be integrated with methods and processes focusing on data creation/acquisition, spatial and statistical analysis, data dissemination/presentation, automated systems, and health information management to provide a uniquely informative and enjoyable experience for attendees. [Details about IHGC/2K as well as the first IHGC are at IHGC's website <http://www.jhsph.edu/ihgc>]

5. From **Sam Soret**, Loma Linda University School of Public Health: We currently offer a graduate course on GIS and public health, "Geographic Techniques for Health and Environmental Analysis." In addition, we will be launching in less than 1 year a new undergraduate program, a Bachelor of Science in Public Health in Health Geographics, designed to apply geographic information and analysis to various areas of public health. A description of the program can be found at <http://www.llu.edu/llu/sph/bulletin/bachhealth.htm>. [Contact: Sam at voice (909) 558-8750 or e-mail ssoret@sph.llu.edu]

6. From **Contessa Serna**, ESRI: This is the first year that GIS Day is taking place. Our goal is to educate one million people around the world on GIS technology through geography. It will occur on the Friday of Geography Awareness Week, November 19th. The three principal sponsors are National Geographic, ESRI, and the American Association of

Geographers. If you will be hosting a GIS Day event please register on our web site at www.gisday.com and receive a CD filled with files to help you with your event. The second of three CD's will begin shipping late this week. The CD has fliers, posters, PowerPoint's, logos, white papers, video files and much more to assist you. [Contact: Contessa at e-mail cserna@esri.com]

B. Technical and Research News

7. From **Alan Saalfeld**, The Ohio State University: I have submitted a research proposal (entitled "Integrated Computational Spatial Information Science Applied To Federal Government Spatial Information Processes") to develop new computationally efficient tools to aid in effectively managing specific types of spatial data operations that are almost exclusively the purview of federal government agencies. Those operations include, but are not limited to, (1) major national and global map production and maintenance activities; (2) design, collection, and analysis of geographically stratified sample surveys for the various federal statistics programs; (3) protection from disclosure of confidential or sensitive locational information collected by the federal government; (4) development of spatial data transformations that permit spatial analysis to be performed on the transformed data and then interpreted for the original data; and (5) modeling, measuring, and monitoring global geodynamic processes via discrete observations. Our research team will develop the necessary computationally efficient tools by using algorithms, theory, and methods from computational geometry, its recent specializations (computational topology and computational differential geometry), and its related domains (computational spatial statistics and computational cartography). [For more information about the proposal, or to find out how your agency may participate, contact Alan at voice (614) 292-6665 or e-mail saalfeld.1@osu.edu]

8. From Duncan Kinder (through **Arlene Siller**, CDC NCHS): GRASS Update- Just to follow through on my recent post concerning GRASS, a freeware GIS software package that can run on Linux, a major

upgrade GRASS 5.0, has been announced at <http://www.spatialnews.com/news/1999/issue4/grass50.html>. GRASS, which stands for Geographic Resource Analysis and Support System, is a public domain GIS used for data management, image processing, graphics production, spatial modeling and visualization of any type of spatial data. Originally written by the U.S. Army Construction Engineering Research Laboratories (USA-CERL), GRASS is currently used by an estimated 30,000 people in academic and commercial settings around the world, as well as many governmental agencies, like NASA and the National Oceanic Atmospheric Administration (NOAA). The latest *stable* GRASS 4.2.1 can be found at <http://www.geog.uni-hannover.de/grass>. GRASS 5.0 is a beta release, stable version(s) shall follow later this year. If you want to start with GRASS they recommend GRASS 4.2.1. On line GRASS documentation is at http://www.geog.uni-hannover.de/grass/main_docu.html. [Contact: Duncan at e-mail dckinder@mountain.net]

9. From **Linda Dahlberg**, CDC NCIPC (Attention SPSS users): According to the latest information from SPSS, version 9.0 on the Windows platform is the only truly Y2K compliant version. CDC has a limited amount of money set aside for Y2K software upgrades. If you need to upgrade your SPSS license to version 9.0, email Alvin Hall (IRMO) with the description of need, number of copies and cost. For more information see <http://www.spss.com/y2k/> or <http://www.spss.com/software/spss/atwork/government/federal.htm>. [Source: Linda at voice (770) 488-4496 or e-mail lld0@cdc.gov]

10. From **Wayne Johnson**, CDC NCHS (Interactive Statistical Calculation Pages [Java, JavaScript]): John Pezullo, Associate Professor of Pharmacology and Biostatistics at Georgetown University, has helped compile this monstrous metasite of freely accessible multi-platform statistical software at <http://members.aol.com/johnp71/javastat.html>. With links to pages around the world, the table of contents includes access to calculators, plotters, random number generators, and programs that perform literally hundreds of calculations. Hosted by America Online, the site also

includes links to online statistics books, tutorials, and downloadable software. This is a virtual treasure trove of statistical calculations. [Contact: Wayne at voice (301) 436-7047, ext. 151 or e-mail wxj0@cdc.gov]

C. Internet News

11. From **Kristin Stoklosa**, NIH: Social Science Citation Index (SSCI) is now available in Web of Science at <http://publisherperish.nih.gov> <http://publishorperish.nih.gov>. SSCI indexes 1,700 journals in areas including anthropology, public health, linguistics, substance abuse, psychology, psychiatry, and social work. In a citation database, you can search for articles by author or topic, or you can do a cited reference look-up to see how many times and by whom a particular author or article has been cited. To use SSCI, follow the Web of Science link, and select the Full Search button. You need to select SSCI and select the years you wish to search, noting that the 1997 - 1999 data are currently available. Eventually, the data will extend back to 1980. PORPOISE e-mail updates as well as document delivery are available for SSCI. Web of Science is a joint project of the NIH Library and CIT. If you have questions about the system, please call the NIH Library at 496-1080.

12. From **Marjorie Roswell**, University of Maryland Baltimore County: Readers may wish to check out Health Geographics Resources at <http://cgi.umbc.edu/~chpdm/healthgeo/> which I've been maintaining for three years. Anyone with useful resources in health statistics, medical geography, epidemiology, public health, GIS, and data visualization may submit resources directly to this page. [Contact: Marjorie, UMBC Center for Health Program Development and Management, at voice (410) 455-6802 or e-mail roswell@umbc.edu]

13. From **Barbara Poore**, USGS (Framework survey data now available for states): Learn who is producing transportation data in your area, approximately how much they are spending, and whether they share data. Data from the recent survey of framework data sets conducted by the National States Geographic Information Council in cooperation with the Federal Geographic Data Committee are now being made

available for individual states. Framework data include the themes of elevation, hydrography, geodetic control, cadastral, transportation, governmental units and orthoimagery. The survey, conducted by state coordinators in 1997-8, produced over 5200 responses from individual organizations throughout the nation who are creating, maintaining and updating data in one of those themes. The survey provides detailed information on the who, what, when, where and why of framework data. Data from seventeen states are currently available in several database formats, along with a report on the sampling frame used by individual state coordinators, and useful tables that are byproducts of the data analysis. The data from more states will be posted as they are processed. State data can be accessed at: http://www.fgdc.gov/framework/survey_results/samples/index.html. [Contact: Barbara Poore at e-mail bspooe@usgs.gov]

D. CDC/ATSDR- Atlanta GIS News

14. From **John Stinn**, CDC PHPPPO: Public Health Informatics Fellowship Program- Friday Morning Educational Session, Friday, September 3rd, 1999, Koger Center, Rhodes Building, Room 5080, at 9:00 A.M. The Journal Club will discuss several articles including "Toward a GIS sampling frame for surveys of local health departments and local boards of health" that appeared in *J Pub Health Manag and Practice* 1999; 5(4): 65-75, by Tom Richards, et. al. [Contact: John at voice (770) 488-2449 or e-mail zjj8]

15. From **Bill Henriques**, ATSDR: Andy Dent here at ATSDR developed a John Snow project in ArcView for our training purposes which will be distributed with the EpiMap2000 software coming out in the near future from CDC's Andy Dean. It takes the Snow work and puts it into a GIS context, allowing the user to pull data into the system using two different techniques (event theme and address matching), and the query power of GIS.

Related to Ralph Vaughn's below announcement (see item #16), ATSDR began the beta-testing of their Public Health Map Objects-based Internet Map Server on August 31, 1999. This prototype will provide users with the ability to layer TIGER 97 data with other data sets relevant to public

health and environmental researchers (e.g., Census block and block-group demographics, socioeconomic information, and health data as they become available; hazardous waste site locations; public and private schools, and other features at the local level). It is hoped that this GIS will serve as the basis for a system that will assist researchers at CDC/ATSDR and their public health partners outside of CDC/ATSDR to provide mapping and spatial analysis capabilities. CDC's IRMB Office and ATSDR's GIS group are working closely together to meet the needs of CDC/ATSDR's GIS community. These two groups are meeting to discuss a policy for a high-end GIS server in the near future. Stay tuned for additional information as it comes available. [Contacts: Bill at voice (404) 639-6088 or e-mail wdh2@cdc.gov; Andy Dent at voice (404) 639-6099 or e-mail aed5@cdc.gov; and Andy Dean at voice (404) 639-1326 or e-mail agd1 @cdc.gov]

16. From **Ralph Vaughn**, CDC IRMO: FY1999. The Network Technology Branch (NTB) within CDC's Information Resource Management Office (IRMO) has recently purchased a new high speed, high capacity CDC/ATSDR GIS Internet Server. The server is a Dell Poweredge 6300 with quad 500 Mhz processors, 4 Gigabytes of RAM and eight 18.2 Gigabyte hard disk drives (177.6 Gigabytes total disk space). An option is also available for an additional 177.6 Gigabytes of external disk space. In the next several months NTB plans to purchase ESRI Internet Mapping Software (IMS) either ArcView IMS or Map Objects IMS and the appropriate IMS extension and deployment licenses.

NTB's immediate goal is to provide and maintain a centralized GIS server and appropriate software to be used by the CDC/ATSDR GIS community to host GIS data sets that will be available to the public on the Internet. NTB will be responsible for providing and maintaining the hardware and software licenses and the CIOs will be responsible for migrating, maintaining datasets and any programming interfaces.

FY2000. We are currently investigating the possibility of FY00 IRMO funding to acquire and maintain a CDC/ATSDR corporate/master site license,

maintenance agreement and technical support for ESRI ArcView. The initial site license will be for approximately 100 ArcView licenses and include a maintenance contract that will provide us with upgrades and modifications/patches as they become available. We are also seeking IRMO funding to purchase a multi-user technical support license that will be available to IRM personnel at individual Centers and allow those IRM staff access to the ESRI Technical Support team.

If funding is not forthcoming, IRMO will coordinate the purchase of a ESRI GIS corporate/master site license for those CIOs who wish to participate and provide funding. In preparation we will be asking CIOs to provide NTB with an annual estimate of GIS ArcView licenses that will be purchased. These topics will be discussed at the September 7, 1999 meeting of the Atlanta CDC GIS Users Group. [Contact: Ralph at voice (404) 639-7711 or e-mail rxv2@cdc.gov]

17. From **Janet Heitgerd**, ATSDR: There will be a meeting of the Atlanta CDC/ATSDR GIS Users Group, on September 7, 1999, 1:00-4:30 P.M., at the Corporate Square, Building 11 Conference Room. Scheduled Presentations include: 1. Crisis Prediction Disaster Management, Consequence Assessment Tool Set (CATS) Demonstration- Science Applications International Corporation; 2. GIS and Public Health, Jennifer Harar, Health Solutions Team, ESRI; 3. CDC GIS Initiative, Ralph Vaughn, CDC IRMO; and, CDC/ATSDR GIS Users Group - Atlanta, Jerry Curtis, NCEH. [For more information contact Jerry Curtis, NCEH (770) 488-7262, Janet Heitgerd, ATSDR (404) 639-0602 or Dabo Brantley, NCCDPHP (770) 488-5111]

18. From **Tom Richards**, CDC NCCDPHP: Jerry Rushton (University of Iowa), Martin Kulldorff (University of Connecticut), and Mark Baptiste (New York State Department of Health) will participate in a Symposia panel on "Mapping Cancer: To Inform But Not Mislead." The panel is scheduled from 3:30-5:00 P.M. on Wednesday Sept 8, 1999 at the upcoming 1999 National Cancer Conference at the Marriott Marquis, Atlanta, Georgia. [Contact: Tom at voice

(770) 488-3220 or e-mail tbr1@cdc.gov]

19. See Special Report (Section IV) from **Bill Henriques**, ATSDR on GIS at recent NEHA and NAACHO meetings.

E. CDC/ATSDR- Ft. Collins, Hyattsville, Morgantown and Others GIS News

20. From Editor: **Fred Broome** and **Jon Sperling** (Census Bureau), and **Chuck Croner** (CDC NCHS), will conduct a workshop "Basics and Potential Uses of GIS in Public Health" for the combined 1999 Tenth Annual CityMatCH Urban MCH (Maternal and Child Health) Leadership Conference and the Fourth Biennial National League of Cities' Your City's Families Conference, in Baltimore, on September 15, 1999. The purpose of the workshop is to teach the fundamentals of GIS technology and how it can empower cities and local communities to more cost-effectively invest in disease control and prevention activities. Topics include GIS functionality, address matching and geocoding, thematic mapping, database integration with GIS software, and applications in disease surveillance and prevention. [Contact: William Sappenfield, MD, MPH, CDC Assigned MCH Epidemiologist, at voice (402) 559-2423 or e-mail wsappenf@unmc.edu]

21. See Special Report (Section IV) from **Chet Moore**, NCID CDC (Ft. Collins) on his participation in the workshop on Health Research Methods and Data, Turku, Finland.

III. GIS Outreach

(Editor: All requests for Public Health GIS User Group assistance are welcome; please note that the use of trade names and commercial sources that may appear in *Public Health GIS News and Information* is for identification only and does not imply endorsement by CDC or ATSDR)

☛ From **Cynthia Warrick**, Howard University: Planning is underway for our Year 2000 HBCU Summer Faculty GIS Workshop that will include an HBCU GIS and Environmental Technology Conference. Feedback from faculty participants indicates a strong interest in learning more about Visiting Summer Faculty positions as well as student

co-op positions in these GIS workshops. Our goal is to establish positions where HBCU faculty and students, working with GIS professionals, truly can enhance their skills and understanding as to how agencies use GIS. Please contact me if you seek a rewarding instructional experience or would like to learn how your agency can play a supportive role in our HBCU program [Contact: Cynthia at e-mail cwarrick@howard.edu]

☛ From **Kate Curtis**, CDC NCCDPHP: I recently received a call from a student who is about to be a junior at Middlebury College. She is a geography major, with minors in biology and sociology, and her career interests are in geography and infectious diseases (with her "ultimate goal" to be in the EIS program!). She's looking for an month-long internship with someone doing this kind of work at CDC- this would mainly be following someone around and getting a sense of what professionals do in this area. I was wondering if any GIS users could suggest anyone I could talk to about setting her up with an internship. [Contact: Kate at voice (770) 488-5965 or e-mail kmc6@cdc.gov]

IV. Special Reports

A. 16th Annual Historically Black Colleges and Universities (HBCU) Summer Faculty Geographic Information Systems (GIS) Workshop
By Cynthia Warrick, School of Pharmacy, Howard University (Reports A and B)

The Howard University Urban Environment Institute (UEI) coordinated and hosted the 16th Annual HBCU GIS Summer Faculty Workshop for the third year. Based on the evaluations received from workshop participants, the training was extremely useful and will be shared with various communities within the participants' home institutions.

Project Description and Goals. The Urban Environment Institute (UEI) administers the HBCU Geographic Information Systems (GIS) Summer Faculty Workshop project. The UEI was established to advance the ideals of environmental justice for the empowerment of communities impacted by pollution and hazardous sites. Impacted communities must have

the resources and ability to marshal data and other information to make informed environmental decisions. It is UEI's mission to help impacted communities develop and retain the required resources and capabilities.

The project aims to strengthen the capacity of faculty members from HBCUs to incorporate the use of GIS into their academic instruction and research. The project recognizes that limited resources and lack of expertise have resulted in inequities of opportunity for students at these institutions to acquire this knowledge in a rapidly growing market. The use of information is the driving force of business and academia. The HBCU GIS Summer Faculty Workshop has over fifty faculty alumni in the United States. Many of these faculty members are the single points of contact for information about GIS in their colleges and universities.

Although the workshop provides a medium for training, discourse, and networking for the promotion and coordination of geospatial technologies at their schools, progress is being made at a very slow pace. Additionally, because the workshop is a part of the Federal Geographic Data Committee National Spatial Data Infrastructure initiative, there are improved opportunities for HBCU faculty members to share information and GIS activities among universities, private industry, and state, local, and federal government. This year's participants planned to capitalize on opportunities for community service by having their minority institutions conduct spatial and demographic analyses, disseminate public data, and offer technical assistance in their local communities.

Logistics: This year's training was held June 13-19, 1999 at the U.S. Fish & Wildlife National Conservation Training Center (NCTC) in Shepardstown, West Virginia. The NCTC provided a high quality computer laboratory. The workshop was funded through federal agency contributions and in-kind services. Sponsors included the U.S. Geological Survey, U.S. Fish & Wildlife Service, Bureau of Land Management, Office of Surface Mines, and National Imaging and Mapping Agency.

Interest in the workshop attracted more than 35 applications. Twelve (12) participants were selected from institutions or departments that had not

previously participated in the workshop. Participants represented diversity in race/ethnicity, gender, geographic location, size of university, and area of academic focus. The 1999 Summer Faculty GIS Workshop was attended by the following staff: Dr. Patrick May (Coppin State University); Dr. Robert Copeland Jr (Howard University); Dr. George P. Burbank (Hampton University); Cassandra Walker (Morehouse School of Medicine); Dr. Alexandrine Randriamahefa (Oakwood College); Leonard Gore Jr. (South Carolina State University); Dr. Hussain Al-Fadhli (Tougaloo College); and, Dr. Obadiah M. Njue (Wiley College).

Howard University staff participation included Program Manager, John Rosenthal; Project Director; Dr. Cynthia Warrick; Program Assistant, Gloria Thurman; and Consulting Engineer, Pamela Bingham. Other agency participants included Lee DeCola, Co-Coordinator, U.S. Geological Survey; Karl Osvald, Bureau of Land Management; Dr. Suzette Kimball and Glenn Gravatt, U.S. Fish & Wildlife Service/NCTC and several USFWS/NCTC staff members.

Training: The substantive training agenda included 2 ½ days of Introduction to ArcView and 2 ½ days of Global Positioning Systems (GPS) training. Walt Rennick, the director of ESRI's Washington Metropolitan Office conducted the GIS training. ESRI also provided each of the participants with a complimentary copy of the ArcView software. There were numerous field exercises in addition to software training on personal computers in a state of the art facility at the NCTC. Special guest Charles Croner, CDC National Center for Health Statistics provided a focus area presentation and discussion on the applicability of GIS training in the health studies. BLM's Karl Osvald also contributed a bibliography of GIS information as well as practical case studies.

A reception was held for participants and guests that was highlighted by an engaging GIS panel. The featured panelists included Keynote Speaker Dr. Suzette M. Kimball, U.S. Department of Interior, U.S. Geological Survey, Eastern Regional Office, Biological Resources Division Regional Chief Biologist, Kearneysville, WV; Leonard Gore, Jr., South Carolina State University GIS Analyst, Orangeburg, SC; and Glenn Gravatt, National

Conservation Training Center, Branch Chief for Technical Training, Shepardstown, WV.

Future GIS Utilization: Recognizing that a primary workshop goal was to encourage GIS utilization on HBCU campuses and in neighboring communities, participants were asked about future GIS use. When asked, “Will this workshop training be applicable to your work? How will you use it?”, the replies were as follows: “I will integrate GIS/GPS information into course curriculum”; “Will use it for training and education of in-house staff. Also, more extensive analysis will be done on existing coverage”; “This workshop has direct application to our research in breast and prostate cancer epidemiology. This course will also be included at least as an introduction, in my medical informatics course to medical and graduate students”; “I will use it for research on Hampton River, locating and tracking students, alumni, and interns and laboratory classes on environmental sciences, geology, and marine science”; “I can use GIS in two areas that I usually teach at Tougaloo College- demography and epidemiology”; “In mapping of water sources and sample sites for water quality analyses in East Texas (around Marshall, TX)”; and, “I anticipate many applications to my research. As some previous research was based on ArcView data, I will be able to re-evaluate and better analyze that information.”

Contributors: The training was a highly successful and collaborative effort. Howard UEI recognized the substantial contributions of a diverse group of agencies and individuals. The following “partners” helped to insure the success of this effort: U.S. Department of Interior/United States Geological Survey (USGS); U.S. Department of Interior/Bureau of Land Management (BLM), Office of Surface Mines; National Imaging and Mapping Agency (NIMA); U.S. Fish and Wildlife Service, National Conservation Training Center (NCTC); and, Environmental Sciences Research Institute (ESRI). The following persons recognized include: Lee DeCola and Larry Hothem, USGS; Bill Nunn and Karl Osvald, BLM; Doug Gentile, Glenn Gravitt and Thelma Flynn, U.S. Fish and Wildlife Service; James Joiner, Office of Surface Mines; Gary Hacker, NIMA; Leslie Weiner-Leandro, Federal Emergency Management Agency

(FEMA); Katie Ryan, National Parks Service (NPS); Greg Tune, American Red Cross; Charles Croner, CDC National Center for Health Statistics; and, Walt Rennick, ESRI. [Report prepared by **Cynthia Warrick**, Ph.D., Assistant Professor, Dept. of Clinical and Administrative Pharmacy Sciences, School of Pharmacy, Howard University at voice (202) 806-4919 or e-mail cwarrick@howard.edu]

B. Advancing HBCU Collaborations in Environmental Science and Geographic Information Science Research.

Introduction: The satellite education session of the 5th African-American Summit took place at the Center for Remote Sensing in the Department of Geography & Resource Development at the University of Ghana Legon on May 17, 1999. In addition to the remote sensing lab, the department has four units: Ecology Lab, AID Population Management Program, UIU Land Management & Environmental Change Project, and the Household Environmental Management Institute. The goal of this workshop was to establish a collaborative research agenda coupling African and US faculty in environmental and geographic information science. The daylong session began with welcomes from the chairman of the department, Dr. Nabila, and the director of remote sensing, Professor Yankson. There were approximately 20 participants consisting of faculty and staff from the geography department and remote sensing unit and HBCU faculty members from Howard University Washington, DC, Fayetteville State University Fayetteville, NC, North Carolina Central University Durham, NC, Tuskegee University Tuskegee, AL, and Alcorn A & M University Alcorn, MS. Additional participants included faculty from the Science & Technology University at Kumasi, Ghana, a faculty member from Occidental University – Los Angeles, CA and ESRI representative/trainer, and the CEO of Samburg International, the sole source distributor for ESRI GIS software and sponsor of *GIS Africa*.

Workshop Description: The morning workshop consisted of faculty and doctoral student presentations from the University of Ghana on their research in environmental science and remote sensing. Topics covered included soil quality, land-use planning, water

quality, health & sanitation planning, and spatial data analysis. In the afternoon session the participants were divided into three workgroups to discuss specific research and collaborative topics in transportation planning, environmental management and land-use planning, and health interventions. Following two hours of work-group discussions, the group toured the remote sensing labs and offices. The GIS professionals in the remote sensing laboratory gave a presentation on the Ghana Environmental Resources Management Project. This project was commissioned by the Ghana Environmental Protection Agency in 1993 to produce land use information and maps for the entire country. Because the project is reaching completion, the lab has established itself as a state of the art GIS training facility providing client-oriented services in geo-referenced spatial information and academic, business, and community training in GIS and other computer information education.

Workshop Outcomes and Critical Next Steps:

The collaborative activities of this workshop have resulted in the initial planning of three research projects in the following areas: comparative land-use planning & environmental quality, the cultural barriers of tuberculosis patient compliance, and possible adverse health effects in agro-chemical use in agricultural farming. The HBCU faculty and University of Ghana participants will continue research proposal development and planning through electronic mail communication. Possible research follow-up will take place next year in the United States at the 17th Annual HBCU GIS Summer Faculty Workshop at Howard University. [Note: Cynthia Warrick and Professor Paul Yankson, University of Ghana-Legon, served as Workshop Co-Chairs]

International Workshop on Health Research

Methods and Data

By Chet Moore CDC NCID (Fort Collins)

Chet Moore and **Steve Guphill**, USGS, Reston, VA, presented a position paper entitled "Methods and Data for Vector-borne and Zoonotic Diseases" at an international workshop on health research methods and data in Turku, Finland. The July workshop was one of a series of four planned workshops. Attendees represented a variety of disciplines including medical

geography, spatial analysis/statistics, modeling, epidemiology, and ecology. An abstract of the paper and a description of the workshop follows.

Abstract. "Methods and Data for Vector-borne and Zoonotic Diseases": Although people have been intuitively aware of the relationships between human health and the environment for centuries, only recently have scientists acquired the tools and the data to make clear the relationships between the habitats of disease agents, their vectors and vertebrate hosts, and the occurrence of disease in the human population. Using vector-borne and zoonotic diseases as an example, we demonstrate the current and potential uses of remote sensing and related technologies for the surveillance, prevention, and control of disease. Vector-borne diseases account for a large portion of the annual global morbidity and mortality. They are naturally occurring systems that are impacted by a wide variety of physical and biotic factors that may be susceptible to remote measurement, and there is considerable concern about the potential impact of global change on the dynamics and spread of these diseases. We describe recent applications of geographic information systems (GIS) and remote sensing to malaria, African trypanosomiasis, Lyme disease, tick-borne encephalitis, cholera, and schistosomiasis. We then review existing and proposed remote sensing platforms that are expected to have applications to studies of disease ecology and epidemiology. Finally, we identify several issues and needs in remote sensing and GIS, namely spatial and temporal scale, imagery sources, availability of ground data, privacy issues, spatial analysis and statistics, and modeling or simulation needs. We suggest that much of the eventual progress in applying this new technology to the solution of human problems, including the diseases of interest to us, will depend on the priorities set by universities, governments, and funding agencies, as well as interdisciplinary collaboration between these agencies.

Workshops. Workshop I-Health and Climate Variability: [Dr. Pim Martens, coordinator, Maastrich, The Netherlands, September 24-26, 1999] This workshop will focus on individual events within and outside the range of normal variability and events associated with major regular environmental fluctuations such as those associated with El Niño. It

will also focus on changes in long-term trends such as those related to greenhouse gas-induced climate change. Workshop participants will be asked to consider what climatic events mean for human health vulnerability, infectious disease diffusion, how climate and health can be integrated within the same models and what are likely future scenarios.

Workshop II-Health and Resources: [Professor Elizabeth Thomas-Hope, coordinator, Kingston, Jamaica, November 12-14, 1999] Water and terrestrial issues will be the focus of this workshop. Workshop participants will be asked to consider issues such as water quality/quantity, desertification, land degradation, land control, deforestation, etc. and link these environmental issues to human health in the context of food security, human nutrition, infectious and chronic diseases and biodiversity.

Workshop III - Health and Urbanisation: [Professor Sunita Narain, coordinator, New Delhi, India, October 3-5, 1999] The organising theme for this workshop will be vulnerable populations within cities in developing and developed countries. Workshop participants will be asked to consider issues such as the effects of heat waves, indoor and outdoor air quality, the supply of clean water, waste disposal, personal exposure to environmental and health risks.

Workshop IV- Health Research Methods and Data: [Professor Markku Loytonen, coordinator, Turku, Finland, July 22-25, 1999] The focus of this workshop is on the use of new research methods and data needs in linking health and environmental research. Workshop participants considered issues such as the latest developments in satellite photoimagery, remote sensing, geographical information systems (GIS), and ecological footprinting as ways of tracking environmental change and the implications for health issues. Participants considered data needs and the role that research methods such as risk assessment, process modelling and visualization can and/or should play at the research-policy interface.

The SCS has developed a Web page which will catalogue position papers, workshop reports and the final report as they become available. Researchers will be able to acquire any of the publications of this research initiative as downloadable files from <http://post.queensu.ca/~jlj/healthandenvir/index.htm>.

[Contact: Chet at voice (970) 221-6423 or e-mail cgm2@cdc.gov]

NEHA Conference and NAACHO Workshop

By Bill Henriques, GIS Coordinator, ATSDR

The National Environmental Health Association (NEHA) conference in Nashville, TN had two sessions that were dedicated to the use of GIS in environmental health protection. Some highlights: Dr. Bill Henriques, GIS Coordinator of the Agency for Toxic Substances and Disease Registry, provided an overview of GIS for those new to spatial analysis, and another presentation on how GIS is used by ATSDR to protect persons that live near hazardous waste sites. Mr. Carl Kinkade from the Lincoln-Lancaster Health Department, Nebraska, presented his work regarding the use of GIS to identify environmental justice issues in his community. He also demonstrated the prototype of the Internet Map Server for the health department, which is now available. Dr. Lee DeCola of the US Geological Survey provided an overview of the use of GIS in vector-borne disease surveillance and mitigation, and highlighted some of the products available from the USGS to assist in the protection of public health.

The National Association of County and City Health Officials (NACCHO) meetings in Detroit had a one-day GIS workshop prior to the start of the conference. Participants were instructed on basic GIS concepts, and several examples of GIS applications were presented. Attendees were also provided with a copy of the ESRI Business Map software, and worked with the Consequences Assessment Tool Software (CATS) to investigate the impact of an accidental or intentional release of a chemical or biological agent. A demonstration of the CATS software will be shown at the upcoming Atlanta GIS Users meeting on September 7th. [Contact: Bill at voice (404) 639-6088 or e-mail wdh2@cdc.gov]

V. GIS and Related Presentations and Literature

(This section may include literature citations, abstracts, syntheses, etc., and submissions are open to all)

NCHS Cartography and GIS Guest Lecture Series. [The Use of a Spatial Statistics Package for GIS Analysis in](#)

Public Health Applications: To be presented by Ned Levine, Ned Levine and Associates, Annandale, VA, **September 16**, 1999, 2:00-3:15 P.M., at the NCHS Auditorium, Hyattsville, MD (Envision available to offsite locations). ABSTRACT: *CrimeStat* is a spatial statistics package that was developed for the National Institute of Justice (NIJ) to aid in crime mapping applications. The program is a public domain stand-alone Windows NT/9x program that can interface with most desktop GIS packages. It can read 'dbf' files and can write various graphical objects to ArcView, MapInfo, Atlas*GIS, Surfer, and Spatial Analyst. It has a collection of statistical tools for the analysis of point/incident location (i.e., having single X/Y coordinates) and includes a range of diagnostic spatial statistics. Some of the routines are specific to crime analysis, but many could be applied to epidemiological and public health problems. [Contact: Ned@NedLevine.com or <http://www.nedlevine.com/>]

The Historical Black Colleges and Universities (HBCUs) GIS Summer Faculty Workshop: To be presented by Cynthia Warrick, Howard University and Lee De Cola, USGS, **October 21**, 1999, 2:00-3:15 P.M., at the NCHS Auditorium, Hyattsville, MD (Envision available to offsite locations). ABSTRACT: In 1983 the U.S. Geological Survey (USGS) began a series of annual Historically Black College and University (HBCU) Summer Faculty GIS Workshops that have since exposed over 200 participants to the latest geospatial data, ideas, and techniques. This presentation reviews the history of HBCU GIS activity, highlights its value to minority communities, and suggests how an increasing Workshop emphasis on health problems will lead to: the spread of technology among disadvantaged communities; the greater use of GIS in public health; increased diversity in technical fields; and, an HBCU network of community public health resources. The Workshops - now based at Howard University and supported by a wide range of Federal agencies - demonstrate the value of HBCUs as community public health planning resources. [Contact: Cynthia at voice (202) 806-4919 or e-mail cwarrick@howard.edu]

Geographic Information Systems in Public Health, Part 2. *Journal of Public Health Management and*

Practice, Vol. 5, No. 4, **July 1999**, Issue Focus: Richards TB, Croner CM and Novick LK, editors. This roundtable, Part 2, continues the Part 1 (March 1999 issue of JPHMP) orientation for those state and local public health practitioners who would like to use GIS technology to improve community health. Topics addressed in Part 2 include: an overview of potential database sources for GIS analysis; guidance for local health departments (LHDs) beginning GIS by an LHD that has been GIS-active since 1994; GIS and research development efforts by the National Association of County and City Health Officials; reports from two LHDs on GIS applications to address environmental pollution; a report from a state health department on how GIS has been applied to childhood lead poisoning prevention and welfare reform; an agency enterprise approach to GIS use for community planning by the U.S. Department of Housing and Urban Development; plans within the Centers for Disease Control and Prevention to add GIS functionality to its public domain mapping software, Epi Map; trends in mapping and spatial analysis for the Internet; a feasibility study of how GIS might be applied to develop a national sampling frame of U.S. LHDs and local boards of health; and thoughts about a public health research agenda for the 21st century.

Contents: Yasnoff WA, Sondik EJ. Geographic Information Systems (GIS) in Public Health Practice in the New Millennium. *J Public Health Management Practice* 1999; 5(4): ix-xii; Goodman DC, Wennberg JE. Maps and Health: The Challenges of Interpretation. *J Public Health Management Practice* 1999; 5(4): xiii-xvii; Richards TB, Croner CM, Novick LF. Geographic Information Systems in Public Health, Part 2. *J Public Health Management Practice* 1999; 5(4):1-6; Lee CV, Irving JL. Sources of Spatial Data for Community Health Planning. *J Public Health Management Practice* 1999; 5(4):7-22. Rogers MY. Getting Started with Geographic Information Systems (GIS): A Local Health Department Perspective. *J Public Health Management Practice* 1999; 5(4):22-23. Bouton PB, Fraser M. Local Health Departments and GIS: The Perspective of the National Association of County and City Health Officials. *J Public Health Management Practice* 1999; 5(4):33-41; Hanchette CL. GIS and

Decision Making for Public Health Agencies: Childhood Lead Poisoning and Welfare Reform. *J Public Health Management Practice* 1999; 5(4):41-47; Dean L. Revitalizing Communities with Geographic Information Systems (GIS): HUD's Community 2020 Software. *J Public Health Management Practice* 1999; 5(4):47-53; Dean AG. Epi Info and Epi Map: Current Status and Plans for Epi Info 2000. *J Public Health Management Practice* 1999; 5(4):54-57; Foresman TW. Spatial Analysis and Mapping on the Internet. *J Public Health Management Practice* 1999; 5(4):57-64; Richards TB, Henriques WD, Croner CM, Brown CK, Saccenti JC, Berry P. Toward a GIS Sampling Frame for Surveys of Local Health Departments and Local Boards of Health. *J Public Health Management Practice* 1999;5(4):65-75; and, Thrall GI. The Future of GIS in Public Health Management and Practice. *J Public Health Management Practice* 1999; 5(4):75-82. [For information about reprints, contact: Professional Sales Department, Aspen Publishers Inc, 2000 Orchard Ridge Drive, Suite 200, Gaithersburg, MD 20878; telephone 1-800-638-8437]

Emerging Infectious Diseases

The **July-August 1999** issue of CDC's journal, *Emerging Infectious Diseases* (EID), is now available at <http://www.cdc.gov/eid>. Many articles (titles only shown below) address the issue of bioterrorism: Medical and Public Health Response to Bioterrorism; Bioterrorism: How Prepared Are We? [D.E. Shalala]; The Emerging Threat of Bioterrorism; Congressional Efforts to Address Bioterrorism; Finding the Right Balance against Bioterrorism; Historical Trends Related to Bioterrorism; The Threat of Biological Attack; BW Programs of the Former Soviet Union and Iraq; Aum Shinrikyo: Once and Future Threat?; The Prospect of Domestic Bioterrorism; Potential Biological Weapons Threats; Epidemiology of Bioterrorism; Vaccines in Civilian Defense Against Bioterrorism; Vaccines, Pharmaceutical Products, and Bioterrorism; Smallpox: Clinical and Epidemiologic Features; Smallpox: An Attack Scenario; Aftermath of a Hypothetical Smallpox Disaster; Clinical and Epidemiologic Principles of Anthrax; Anthrax: A Possible Case History; Applying Lessons from Anthrax Case History; Addressing Bioterrorist

Threats; Cytotoxin-Producing *E. coli* O157 in Wales; Deer Tick Virus in the Northcentral U.S.; Dengue Reemergence in Argentina; Chlorine Disinfection for *C. parvum*; *C. cayetanensis* in West Java, Indonesia; Dengue Hemorrhagic Fever in Delhi, India; and, The Potential Threat of Bioterrorism.

Morbidity and Mortality Weekly Report

Selected articles from CDC's *Morbidity and Mortality Weekly Report* (MMWR): **August 27**, 1999, Vol. 48, No. 33- Progress Toward the Elimination of Tuberculosis-United States, 1998. **August 20**, 1999, Vol. 48, No. 32- Notice to Readers: Satellite Broadcast on Biological Warfare and Terrorism. **August 20**, 1999, Vol. 48, No. RR-10- 1999 USPHS/IDSA Guidelines for the Prevention of Opportunistic Infections in Persons Infected with Human Immunodeficiency Virus; Appendix. Recommendations to Help Patients Avoid Exposure to Opportunistic Pathogens. **August 13**, 1999, Vol. 48, No. RR-9- Tuberculosis Elimination Revisited: Obstacles, Opportunities, and a Renewed Commitment. **August 13**, 1999, Vol. 48, No. 31- Radon Testing in Households with a Residential Smoker, United States, 1993-1994; Cigarette Smoking Among High School Students -11 States, 1991--1997; Notifiable Diseases/Deaths in Selected Cities, Weekly Information; **August 6**, 1999, Vol. 48, No. 30- Achievements in Public Health, 1900-1999: Decline in Deaths from Heart Disease and Stroke- United States, 1900-1999; Geographic Variation in Penicillin Resistance in *Streptococcus pneumoniae*- Selected Sites, United States, 1997; and, Mortality Patterns- United States, 1997. **July 30**, 1999, Vol. 48, No. 29- Achievements in Public Health, 1900-1999: Control of Infectious Diseases; Meningococcal Disease- New England, 1993-1998; and, Progress Toward Poliomyelitis Eradication During Armed Conflict - Somalia and Southern Sudan, January 1998-June 1999. **July 30**, 1999, Vol. 48, No. SS-4 (Surveillance Summaries) -Abortion Surveillance-United States, 1996. **July 23**, 1999, Vol. 48, No. 28 issue contains: Pedestrian Fatalities-Cobb, DeKalb, Fulton, and Gwinnett Counties, Georgia, 1994-1998; Ascertainment of Secondary Cases of Hepatitis A-Kansas, 1996-1997; Notifiable Diseases/Deaths in

Selected Cities Weekly Information. The **July 16**, 1999, Vol. 48, No. 27- Intussusception Among Recipients of Rotavirus Vaccine, United States, 1998-1999; Progress Toward Measles Elimination, Southern Africa, 1996--1998. **July 2**, 1999 Vol. 48, No. 25- Measles Control, South-East Asia Region, 1990-1997; Outbreak of Influenza A Infection Among Travelers, Alaska and the Yukon Territory, May-June 1999; and, Notifiable Diseases, Deaths in Selected Cities Weekly Information. **June 18**, 1999, Vol. 48 (RR-8)- Vaccine-Preventable Diseases: Improving Vaccination Coverage in Children, Adolescents, and Adults; and, A Report on Recommendations of the Task Force on Community Preventive Services [For online viewing or .pdf download of MMWR reports, see <http://www.cdc.gov/mmwr> or visit <http://www2.cdc.gov/mmwr>]

Atlas of Cancer Mortality in the United States, 1950-94. S. Devesa, D. Grauman, W. Blot, G. Pennello, R. Hoover, J. Fraumeni, Jr., Division of Cancer Epidemiology and Genetics, National Cancer Institute (expected availability October 1999): The geographic patterns of cancer around the world and within countries have provided important clues to the environmental and occupational determinants of cancer. In the mid-1970s the National Cancer Institute prepared county-based maps of cancer mortality in the U.S. that identified distinctive variations and hot-spots for specific tumors, thus prompting a series of analytic studies of cancer in high-risk areas of the country. We have prepared an updated atlas of cancer mortality in the United States during 1950-94, based on mortality data from the National Center for Health Statistics and population estimates from the Census Bureau. Rates per 100,000 person-years, directly standardized using the 1970 US population, were calculated by race (whites, blacks) and gender for 40 forms of cancer. The new atlas includes more than 140 computerized color-coded maps showing variation in rates during 1970-94 at the county (more than 3000 counties) or State Economic Area (more than 500 units) level. Summary tables and figures are also presented. Over 100 maps for the 1950-69 period are also included. Accompanying text describes the observed variations and suggests explanations based in part on the findings

of analytic studies stimulated by the previous atlases. The geographic patterns of cancer displayed in this atlas should help to target further research into the causes and control of cancer.

Two Web sites associated with the atlas have also been created. The first, a static Web site, enables the user to view the entire contents of the atlas, as well as to download map images and data used to generate the maps. The second Web site is dynamic, in that it allows the user to change quantile cut points and view maps in various ways. Additionally, maps are available at the state level, an option not available in the static Web site. The Web sites will be activated at the time of publication of the atlas. [Contact: Dan Grauman, National Cancer Institute, National Institutes of Health at voice (301) 496-8105 or e-mail dan_grauman@nih.gov]

Disease Mapping and Risk Assessment for Public Health. Lawson A, Editor New York, New York: John Wiley & Sons, 1999. Cost \$115 (plus shipping). This book is strongly oriented towards biostatistical oriented issues/readers, and is an evolution of a World Health Organization Workshop in October 1997 in Rome on Disease Mapping and Risk Assessment for Public Health Decision Making, with 55 contributors. Major parts/sections include: 1) disease mapping; 2) clustering of disease; 3) ecological analysis; 4) risk assessment for putative sources of hazard; 5) public health applications and case studies.

Many of the contributors are from Europe. Contributors from the United States include: Dr. Erin Conlon, Department of Biostatistics, University of Minnesota; Professor Noel Cressie, Department of Statistics, Ohio State University; Professor John Jacquez, Departments of Biostatistics and Physiology, The University of Michigan; Dr. Geoffrey Jacquez, Biomedware Inc, Ann Arbor, Michigan; Dr. Martin Kulldorff, Division of Biostatistics, University of Connecticut School of Medicine; Professor Thomas Louis, Department of Biostatistics, University of Minnesota; Dr. Raymond Neutra, California Department of Health Sciences; Dr. Catherine Poquette, St Jude Children's Research Hospital, Memphis, Tennessee; Professor Hal Stern, Department of Statistics, Iowa State University; Dr. Lance Waller,

Department of Biostatistics, Emory University, Atlanta, GA; and Professor Steven Wing, Department of Epidemiology, School of Public Health, The University of North Carolina at Chapel Hill.

VI. Related Census, DHHS and Other Federal Developments

Public Health Service: National Committee on Vital and Health Statistics. Excerpts of February 3-4, 1999 Meeting Minutes, Washington, D.C. UPDATE FROM THE DEPARTMENT. Mr. Scanlon: The President's Initiative on Race has generated an effort to understand and document the role of discrimination in U.S. society. The Office of Management and Budget is coordinating an effort to improve the current statistical capabilities to measure and track discrimination in five sectors of the economy: criminal justice, the labor market, education, health care, and housing. HHS is responsible for the health care area. It and the other departments will develop a work plan for a literature review and review of the state of the measurement art. A research conference at the National Academy of Sciences in October will help with the latter and set an overall theme.

The Department's initiative on improving discrimination measurement began in January. The Data Council has asked its Working Group on Race and Ethnicity Data to work on the issue. One of its first steps will be a review of published and unpublished works on the statistical capability for measuring discrimination in the health area. Race and ethnicity will be the focus.

PUBLIC HEALTH SURVEILLANCE OVERVIEW. Dr. Friedman introduced this session, which he helped to organize, by observing that the functions of public health surveillance will continue to be crucial in any emerging national health information infrastructure. However, the nature of data and data collection will change. This session will give an overview of public health surveillance activities and related health information issues, with special attention to standards and integration. While multifaceted and largely effective in its primary mission, public health surveillance is also minimally integrated at the person level and over time. It is not unitary at the national or even state level, but rather a

collection of systems that "sometimes don't fit together particularly well." He introduced the three panelists and turned the floor over to Dr. Koo.

Denise Koo, Ph.D., Director, Division of Public Health Surveillance and Informatics, CDC. Dr. Koo stressed CDC's desire to help NCVHS include public health surveillance in its visioning and activities to build the national health information infrastructure. It also wants the Committee's help in articulating the centrality of public health surveillance for public health practice. She noted that epidemiology, a basic science of public health, tries to determine what kind of people have a given disease as well as risk factors and opportunities for intervention, in contrast with physicians, who try to determine what kind of disease a given person has.

Public health surveillance is done to assess public health status, define priorities, evaluate programs, and stimulate research -- all part of public health practice. It needs to be systematic, ongoing, and linked to action. It uses many kinds of data. It is used to estimate the magnitude of a public health problem, follow trends, determine geographic distribution of an illness, portray the natural history of a disease, detect epidemics or define a problem, generate hypotheses, stimulate research, evaluate control measures, detect changes in health practices, and facilitate planning. Dr. Koo gave some examples in each of these areas. She noted that at the local level, surveillance data are also used to identify individual cases and to track contacts for communicable diseases in order to treat them.

For these varied purposes, many types of data are needed from many sources beyond medical data (e.g., police records and traffic accident records). Dr. Koo described the National Notifiable Disease Surveillance System. Reporting is mandated by state law or regulation, not at the federal level. States electronically report to CDC the data they receive from counties, usually on paper. Generally, CDC has separate information systems for surveillance (STDs, AIDS, TB, etc.) because of the categorical funding of public health. The result is a multiplicity of information systems with variable data input and access methods, making it difficult to evaluate problems across programs.

To remedy these problems, with HIPAA as a

motivator, CDC has started working more with standards development organizations (SDOs), especially those concerned with clinically relevant standards. Dr. Koo gave some examples of work with SDOs. The CDC is very interested in computerized medical records. Public health officials want to capture electronic lab data as they are generated, and to get demographic data at the same time. Various state projects for integrated reporting from managed care and Medicaid have CDC funding. The Injury Center has worked with SDOs on emergency department data standardization, and Cancer Registry people are working with HL-7.

Another major project is the surveillance systems integration project, which includes core data for electronic reporting, a unified user interface, and development of a secure data communications pipeline using the Internet. Dr. Koo noted the connections of these efforts to the National Committee's projects on the NHII and on health statistics for the 21st century --examples of the interdependence of public health surveillance and health information systems. She stressed that surveillance is integral to daily public health practice.

Guthrie (Gus) Birkhead, M.D., M.P.H., Director, AIDS Institute, New York State Health Department. Dr. Birkhead said he would offer a state perspective on public health surveillance, noting that "all surveillance is local." Contrasting state/local surveillance with national efforts, he said the statutory basis for surveillance rests with states, along with the link to control. Thus, immediate access to real-time data is important. He gave examples of state/local surveillance and its links to control activities with respect to assuring appropriate treatment of cases, assuring that contacts are treated, removing the source of outbreaks in the community, and monitoring effectiveness in real time (for example, using the BRFSS). He noted that it is difficult to distinguish surveillance from control activities.

The National Notifiable Disease Surveillance System (NNDSS) is built from surveillance data at the local and state level, on a list of conditions recommended by CDC and CSTE. States decide what to monitor and collect standard data elements which are reported to CDC. Individual-level data go to CDC

without identifying information. One issue now is the lack of integration of the national system, making it necessary for states to maintain four separate categorical software packages plus NNDSS reporting. This simply does not work at the local level, where one public health nurse may be responsible for all. He welcomed the push toward integration now taking place in CDC.

Dr. Birkhead showed a matrix with 17 data systems on one axis and 6 health/disease categories on the other. One data system often contains data on several public health categories, highlighting the potential benefits of standardization. Also needed are adequate non-categorical resources for training, surveillance, and local infrastructure development. A related issue is staff: only 1,600 FTEs nationwide are devoted to public health surveillance for all infectious diseases, most of which go to HIV, STDs and TB, with only 64 for food- and water-borne diseases.

In 1994, CSTE released a proposal for a conceptual (virtual) national health surveillance system. It is an umbrella that would provide visibility and get people out of the categorical mindset. It is proposed as a federal/state/local collaboration, one result of which would be a single point of access for surveillance data on the WWW.

Finally, Dr. Birkhead offered a cautionary tale by describing a study in New York that matched gastroenteritis codes from a health care fiscal intermediary with the State's surveillance file. What showed up statistically as a cholera epidemic turned out, after investigation, to be the result of inverted code numbers. The tale points to the dangers of false positives as well as of missed true positives in data collection and reporting using administrative data, and it shows the merits of direct reporting from providers. Adding laboratory and other clinical data will make the information even more useful.

Discussion: Dr. Starfield asked about the prospects for using surveillance to look beyond specific diseases to general issues of poor health, and Dr. Birkhead cited some examples of this kind of effort. CDC is trying to develop new statistical and epidemiological methodologies for detecting trends. Looking at health community-wide is still hampered by the categorical nature of systems and the absence of

key information on risk factors. Dr. Koo cited efforts to relate asthma admissions to air quality data as an example of what CDC is trying to do. Dr. Starfield explained her interest in elucidating the impact of a range of risk factors on individual health, and Dr. Birkhead said another constraint is confidentiality concerns.

Dr. Lumpkin pointed out the instability of denominators, especially in intercensal years, and the resulting problems in determining rates. (He noted that epidemiology is sometimes defined as "the science of searching for a denominator.") He then raised the issue of record-level versus aggregate data in reporting to CDC. Mr. Gellman broadened the question to ask what is collected and what is reported by the different surveillance systems. Dr. Birkhead said this varies; for example, the NNDSS uses record-level data, but without identifiers. The goals of the surveillance system are compromised if providers withhold data because of concerns about confidentiality, and there are efforts to develop a model state statute around confidentiality of surveillance data. Mr. Gellman pointed to the proliferation of narrow confidentiality laws and its result of "more confidentiality laws, not necessarily more confidentiality."

In response to a question, Dr. Birkhead said that confidentiality concerns often cause providers to fail to report. Dr. Davis added that in the occupational injury area, the burden of reporting is the major factor. Mr. Gellman predicted that talk of "linking everybody's computer systems together" will only heighten the public's confidentiality concerns. The panelists commented on the statistical adjustments to account for estimated underreporting. Dr. Friedman estimated that 90 percent of surveillance does require person-specific information because it is aimed at intervention; however, this information stops at the local or state health department level. Dr. Detmer commented that it would be very useful to public health surveillance to have hard information on security lapses and the "leakiness of the system." Mr. Gellman observed that this is hard to find, because most abuses are probably by insiders with legitimate access.

STANDARDIZING SURVEILLANCE DATA FOR IMMUNIZATIONS. *Susan Abernathy, Program*

Analyst, National Immunization Program (NIP), CDC; Member-at Large, HL-7 Board of Directors. Ms. Abernathy stated that immunization registries are confidential, computerized information systems about immunizations in children. Universal coverage is approached by encouraging community and state registries to exchange information through a nationwide network. 60 CDC-funded immunization projects have current or planned registries. The goal is for all private and public providers of immunizations to participate in the Registry, to compile complete immunization histories for each uniquely identified patient. Among other things, a comprehensive system could generate phone or mail reminders when immunizations are due, target at-risk populations, determine aggregate immunization levels for providers, and integrate immunizations with other preventive health programs as well as measuring changes in immunization rates over time.

Children are typically entered into a registry at birth or at their first contact with the healthcare system. Each immunization is sent to the registry. Providers can query the registry for a history of each patient. To do this, registries must receive and process information from many kinds of systems.

Providers are supportive of these goals, but do not want to purchase special equipment or devote additional staff time to participate. To address technical challenges, CDC started working with HL7 in 1995 to develop standardized transactions for transmitting the immunization core data set. Version 2.3 was issued in April 1997, with an implementation guide. The more advanced registries then began developing tools to exchange records using this standard.

In July 1997, President Clinton stated support for efforts to raise immunization levels, promising more federal support. Secretary Shalala was directed to work with the states on an integrated system, and a good deal of work ensued on several fronts. The activities will be announced nationally in a few months.

In the technological sphere, a stakeholder/expert group convened by NIP in August 1998 advised NIP to develop standards and benchmarks rather than trying to develop software for the registries. Floyd

Eisenberg (see below) encouraged the registries to develop a common exchange protocol, and participants agreed to remove optionality from the messages. Five states plus San Bernardino, California then met in September to work out how to use HL7 in their documents, enabling a field-by-field comparison of the formatting of transactions that contributed to development of one common implementation. The cooperative effort has since been joined by the Indian Health Service, the Departments of Veterans Affairs and Defense, and Kaiser Permanente's national Clinical Information System. The first draft of the new implementation guide is being reviewed by participants, and will be published on the Web and provided to vendors when finalized. NIP also plans to educate providers about the systems. Ms. Abernathy concluded that NIP supports the National Committee's work on standardization and on computer-based patient records.

Work Group on Health Statistics for the 21st Century. Five commissioned papers in this area are underway, with drafts due by early April. Invitational discussion groups will be held in March and May on future major issues in health and health care and their implications for health statistics. A two-day session to look at definitional and boundary issues is scheduled for late March. More communication is planned between NCHS and CNSTAT to clarify plans for the workshop CNSTAT will host, possibly in September.

A new, fourth component to this project is a series of activities to elicit views on the entire subject, with plans for open forums, professional meetings, state visits by Dr. Sondik, and possibly a public hearing next fall. Dr. Friedman said this activity was inspired partly by the Canadian provincial hearings on health information needs. Another inspiration is the public process engaged in by the National Institute of Occupational Safety and Health, the National Occupational Research Agenda Process. [Source: For full text see <http://aspe.os.dhhs.gov/ncvhs>]

Preparing for Integrated Information Solutions in the 21st Century [Editor: Digital government is a major initiative for the 21st century. It will require all of us to rethink and retool the ways in which our respective agencies have traditionally conducted

business. Digital technology will demand of us to open our doors to program integration, both within and externally. It will require of us to be more responsive to public user needs, especially in the areas of data access and customer services.

It will impact on the ways in which we conduct research. For example, the National Science Foundation (NSF) is looking for ways to make research more relevant to Federal agency needs. NSF is in the process of preparing a program announcement called Information Technology for the 21st Century, with the acronym IT2. In short, the program is intended to fund \$146M of research on: high-end computational capability; societal, ethical and workforce implications of the information revolution; and increased understanding of how humans, software, sensory data, information systems, and networks interact. In particular, the research topics may include: Software engineering in large systems; Human-computer interfaces; Anytime, anywhere networks; Large-scale information management Information visualization; Social, economic, and workforce implications of IT; IT workforce development; Distributed computing and database systems; Data integration; Information for citizens; Security and privacy; "No surprise" software-verifiable, predictable, provable, adaptable; High-confidence systems-survivability, information; assurance, public key infrastructures; Collaboration technologies; Information agents and intelligent digital assistants; Virtual reality; Universal access for the disabled; High-speed networking and new networking capabilities; Information mining and exploitation; Digital libraries; Digital governance; Electronic commerce and transactions; and, Barriers to information technology diffusion. For more information concerning your agency's possible involvement, contact Larry Brandt, NSF Program Manager for Digital Government, at voice (703) 306-1981 or email lbrandt@nsf.gov.

I have been granted permission to share with you some excerpts from a paper by Wallace M, Landman C, Sperling J and Buczinski C. "Integrated Information Solutions- The Future of Census Bureau Data Access and Dissemination," presented at the 1999 Joint Statistical Meetings of the American

Statistical Association, Section on Government Statistics. In straightforward terms, these staff make the case that the Census Bureau will need to retool its corporate technology infrastructure, through integrated information solutions, or suffer some rather negative institutional consequences. I think you will agree there is a message here for all of us]

“The Integrated Information Solutions (IIS) Program articulates a vision and historic opportunity for the Census Bureau, the Department of Commerce, the larger federal statistical community, and the citizens and taxpayers of our Nation as we enter the 21st Century. IIS will implement a modernized, customer-driven, cross-program, and cross-agency integrated data access and dissemination service capability at the Census Bureau. IIS will broaden information delivery, reduce data user burden, increase efficiencies, and reduce redundancies by providing standards, processes and tools in the administration of a corporate metadata repository; product conception, design, and development; and new disclosure techniques. IIS will serve as a model and catalyst for change in the federal statistical reporting community. Moreover, it will build critical capabilities in the Nation’s emerging statistical and spatial data infrastructures that will support global, national, regional, local, and individual decision support systems...

As we enter the 21st Century amidst a new wave of technological innovation, our Nation’s statistical community is being confronted with an urgent and critical need for more accurate, timely, and relevant data. More powerful computers and rapidly expanding Internet connectivity have revolutionized data access and dissemination capabilities. The U.S. Census Bureau, alone, has seen Internet usage go from 10,000 “hits” a day in February 1994 to 1.3 million “hits” per day in April 1999. According to a report by BancAmerica Corporation, there are over 80 million U.S. web users (home and work) today, with projected growth of 20-25% in the coming years. Federal agencies, in particular, face a loss of credibility and, potentially, support if they fail to deliver the public benefits of this new technology to meet rising customer expectations and fulfill the integrated information needs of our Nation and our

communities...

The IIS Program will support the President’s Executive Order 12906 (April 1994) by linking statistical data to geography and time. Executive Order 12906 initiated the creation of a National Spatial Data Infrastructure, a coordinated effort among federal, State, local and tribal governments to support public and private sector applications of geospatial data in such areas as transportation, community development, agriculture, emergency response, environmental management, and information technology. Part of this initiative was to develop a national digital geospatial data framework to support the 2000 Decennial Census. The Census Bureau is in a unique position to add significant value to this initiative with integration of its massive stores of statistical data while at the same time addressing very important confidentiality and disclosure avoidance issues...

Recent surveys of Census Bureau customers show that two out of three use multiple data sets. These data users would like to dynamically integrate, manipulate, and examine data from multiple sources and time periods to create enhanced content and awareness. Customers accustomed to surfing the Internet are now expecting the capability to make better decisions via ubiquitous access to rich stores of information. And as we provide increased on-line access to 1997 Economic Census, Census 2000, and American Community Survey (ACS) data in the near future, we will certainly raise expectations even more. If we continue to saddle data users with the burden of compiling, sorting, parsing, reformatting, and otherwise putting data from disparate sources into digestible forms, we do it at the risk of our own peril. Yet, as we stand at the edge of the 21st Century with the technical and organizational capabilities to address these needs, far too little has been done...

The IIS Program is an effort to retool our data creation and delivery systems to deliver “integrated information solutions” to customers inside and outside the federal government. It will focus on delivering what customers want, not advancing particular program areas within the government. An “integrated information solution” is an answer to a customer’s question, delivered without the customer’s first having to learn how our programs or our data files are

organized...

Imagine if you will, a customer being able to access a federal web site and to quickly and easily get relevant and useful information on whether it makes sense to re-locate his or her business and family to Anne Arundel County, Maryland. The customer could request data on personally important variables such as retail sales per capita; restaurant sales as a percentage of disposable household income; various age, race, and gender characteristics; cost of living and crime statistics; and recent student-to-teacher ratios and test scores in public schools. Based on this data, compared to other counties in the Washington/Baltimore (or other) metropolitan area, or perhaps counties nationwide if that is what the customer desires, he or she will have valuable information for use in making a good location decision. Or perhaps the user might want to access other available data sets to ascertain other information based on solutions such as: How is my community doing? How is my family doing? How is my business doing? What sales targets should I set for this county? Where would be the best place to retire?

Our existing data dissemination systems, like American FactFinder and FERRET, though very useful in providing flexible access to individual data sets, are not able to provide such a problem and solution oriented view of the data today. The IIS Program will extend current capabilities to provide not only individualized streams of products but dynamically integrated data and metadata that can help provide information solutions...

IIS will address the need to rethink our corporate technology infrastructure. Our current infrastructure is based on technology from the 1960's, 70's, and 80's. We are using outdated systems, and are forced to rely on software and hardware that is becoming obsolete. In assessing technical requirements for producing and delivering integrated information solutions, "homegrown" solutions need to be replaced by commercially available technology. Rather than pursuing technology solutions in a stove-piped manner, focusing on each business area and its needs, data warehousing, metadata tools, and remote access and integration capabilities will be explored and validated in light of how they can deliver

integrated information solutions...

Supporting Spatial and Statistical Infrastructure. One of the primary assets for integrating bureau-wide and government data sets is the Census Bureau's TIGER data base. The creation of this nationwide digital geographic database for the 1990 census, with linkages to all the Census Bureau's extensive social, demographic, and economic data sets, provided a major impetus for GIS developments in the last decade and the ability to easily overlay statistical and other data for common geographic entities. The IIS will extend these developments and create a robust spatial/statistical data integration industry that will support the National Information Infrastructure and National Spatial Data Infrastructure that will feed national and local decision support systems...

The MAF/TIGER database supports the IIS vision of moving from an organization of division-specific providers of traditionally separate data products fixed in time and space to a Bureau-wide provider of continuous information solutions using the most current and reliable data and visualization technology available. TIGER, a nationwide and public digital geographic database that links all the Census Bureau's extensive social, demographic, and economic data sets and the MAF, a nationwide inventory of all residential, and eventually, commercial units are key components of the Census Bureau's data infrastructure that will enable linking, integrating, and visualizing Bureau-wide and government-wide data sets. Ongoing update and enhancement of this database to support census surveys, particularly the American Community Survey (ACS), and other census operations and programs, will promote even greater use and reliability of TIGER for data integration and visualization...

Improvements in coordinate accuracy, more timely updates, insertion of basic street addresses for all residential and commercial structures in TIGER, and the utilization of Global Positioning Technology (GPS) for navigation, location, and update activities will create unprecedented opportunities for better handling data integration across space and time. Respondent level geo-coding would permit more precise delineations of statistical geographic areas and user-defined areas and better enable data integration

across time and space. However, this capability also raises a number of privacy and confidentiality issues that must be addressed...

A team composed of staff from all directorates of the Census Bureau in collaboration with the State Data Centers, other federal agencies, and the research community is researching the potential and validating data integration processes for accessing and integrating both micro and macro level datasets (and their metadata) that are Census Bureau-based and/or remote. The team also is developing a User Interface (UI) design and application to create profiles (predefined and user-specified), and to give customers new data integration functionality, providing information based solutions not currently available in our existing data access tools (AFF, FERRET, etc.). Through work on these pilots, we will address many of the aforementioned issues connected with developing integrated information solutions." [For the full text (.pdf format) contact either Mark Wallace at voice (301) 457-4608 or Jon Sperling at email jsperling@geo.census.gov]

Web Site(s) of Interest for this Edition

Colorado-based Space Imaging has created an email Newswire service that enables subscribers to receive news releases and other announcements electronically. You can visit them at <http://newswire.spaceimaging.com> and the service is without charge. Many of the online articles have sample satellite scenes which users can enlarge interactively. In July, Space Imaging announced it is supplying satellite imagery of the Earth's land masses to Earth Satellite Corp. (EarthSat, Rockville, MD), a Space Imaging reseller. The imagery is being provided in support of EarthSat's GeoCover™ project, which is creating an image map of the world. All of the imagery will be made available to EarthSat by the end of first quarter 2000, and the project is expected to be complete by fourth quarter 2000.

Although I have not yet received details of the program, colleague **David Padgett**, Visiting Professor of Geography, Upward Bound Summer Science Project, Oberlin College, has had his Upward Bound students taking soil samples and measuring lead

content around Oberlin College and in nearby neighborhoods (see <http://sites.netscape.net/upwardboundjrs/homepage> and hotlink to the map). The students have been using ArcView GIS and Trimble GPS equipment. [Contact: David at voice (615) 963-5508 or email david.padgett@oberlin.edu]

There are many GIS projects and expert discussions (about 500 links) documented at gis.mit.edu (follow to MIT and search on GIS). For example, here's a discussion on Object/Layer/Field: "In the last few years some members of the GIS community have argued that the raster/vector debate obscures more essential issues about how people think about and manipulate space. Suppose that you want to describe the agricultural activity in a certain region. There are several spatially-referenced variables that may be of interest: owner, crop grown, soil type, elevation, rainfall, etc. One might speak of farms in the region as geometric objects that have owner attributes. Fields could be objects with a crop grown attribute, and could inherit an owner from the farms that contain them. This is an example where an object-oriented approach to the data is natural: There is clear separation of objects, their representation can be encapsulated, and they form a hierarchy in which representations and attributes can be inherited.

When one adds soil type, however, one may find that a field can contain several soil types or that a soil type may encompass several fields. Subdividing fields into objects that can be given a single soil type attribute may or may not be a good idea-it depends on the importance of the soil type variable. It seems more natural to start a new layer. This in turn creates problems where the same object may have different representations in different layers. A stream, for example, may be represented as a change of ownership and a change in soil type.

It might be natural to think of soil type, elevation, and rainfall as functions defined over the region-cropland as a "vector field." Defining data structures to support continuous data models is difficult because data is usually obtained by discrete sampling. Even so, the amount of data can be unwieldy and data can be expensive to collect. The traditional soil map quantizes the domain into

subjective categories (clay, clay with gravel, sandy, very sandy, etc.) and creates a raster or partitions the region into cells that are assigned one of these soil types to obtain an object-oriented, vector-based map. An implementation of a vector field idea might represent the proportion of each possible component (clay, gravel, sand, etc.) as elements of a vector. One then needs algorithms to quantize this vector space to

present understandable output. Arguments in this debate usually conclude by recommending raster or vector implementation so that the object/layer/field debate, too, becomes limited by current technology.“

Final Thought(s)

I am pleased to share with you a late-breaking development. OPS has announced “It is expected that President Clinton will declare September 20-24 as 1999 National Historically Black Colleges and Universities (HBCU) Week. This designation will recognize the importance of enhancing capacity and building partnerships with HBCUs to help address health problems in communities of color.” As you know, there exists (at least) one very successful effort in the U.S. to build GIS bridges with HBCUs. For example, in the July 1999 edition of *Public Health GIS News and Information*, **Cynthia Warrick** (Howard University) and **Lee De Cola** (USGS) received special tribute for their tireless dedication to conduct their well conceived annual HBCU Summer Faculty GIS Workshops. The summary reports of this years’ workshops are included in this edition. Opportunities to participate or contribute support for these workshops are welcome. Both Drs. Warrick and De Cola will speak about their summer faculty GIS program to CDC/ATSDR staff (NCHS Cartography and GIS Guest Lecture Series) on October 21, 1999. I also am pleased to announce that CDC’s Behavioral and Social Science Working Group has initiated an effort to bridge with HBCUs to establish timely exchanges that are mutually beneficial for HBCU and CDC behavioral and social scientists. Atlanta’s Morehouse School of Medicine will provide this initial point of contact. This is truly a momentous occasion of the first-ever National Historically Black Colleges and Universities (HBCU) Week.

Another exciting development has been the recent effort to focus national attention on the status of GIS in U.S. state and local public health departments. While there are those well ahead of the curve, many departments still remain without software, hardware, or trained staff to apply GIS technology. The efforts of **Tom Richards, M.D.**, Medical Officer, CDC NCCDPHP, are recognized for providing exemplary leadership in this area over the past three years. Under his guidance, our collective awareness of state and local GIS needs and growth potentials has become focused. Many successful state and local GIS projects have been documented and much thought has been given to his vision of GIS boundary delineation of U.S. state and local public health departments. The latter would serve as a national sampling frame for comprehensive and scientific public health planning and assessment. Dr. Richards has helped to define many of the challenges we face to advance GIS in state and local settings. He has given strong voice to the need to incorporate sound epidemiologic principles and methods into GIS analysis. And he has taken the initiative to help define a research agenda to advance the use of Web-enabled GIS and geographic analysis within public health practice in the 21st Century. Thanks in large part to Dr. Richards, we are more conscious today of the importance of our federal, state and local public health commitment and partnership to advance disease control and prevention using GIS. Some timely references include: (1) Richards TB, Croner CM, Novick LF (eds.). Geographic Information Systems in Public Health, Part I. *J Public Health Manag Pract*, 1999;5(2); (2) Richards TB, Croner CM, Novick LF. Atlas of state and local geographic information systems (GIS) maps to improve community health. *J Public Health Manag Pract*, 1999 Mar;5(2):2-8; (3) Richards TB, Croner CM, Novick LF (eds.). Geographic Information Systems in Public Health, Part II. *J Public Health Manag Pract*, 1999;5(4); (4) Richards TB, Henriques WD, Croner CM, Brown CK, Saccenti JC, Berry P. Toward a GIS

sampling frame for surveys of local health departments and local boards of health. *J Public Health Manag Pract*, 1999 Jul;5(4):65-75; and (5) Richards TB, Croner CM, Rushton G, Brown CK, Fowler L. Geographic Information Systems and public health: mapping the future. *Public Health Reports*, 1999;114:359-373 (This paper has received favorable review by CDC EPO and is recommended reading for the summer 2000 Epidemic Intelligence Service (EIS) training course; Table of Contents for *Public Health Reports* is found online at <http://www3.oup.co.uk/publhr/contents>).

Finally, I am honored to be a recipient of the 1999 NCHS Director's Award. It is for "services dedicated to the advancement of scientific excellence throughout the CDC Geographic Information Systems (GIS) and public health surveillance communities." My efforts to promote the scientific use of GIS in epidemiology and public health activities at CDC/ATSDR are shared with you, the more than 370 online CDC/ATSDR staff users. Since 1994, the CDC/ATSDR GIS Users Group has grown both here and well beyond our institutional boundaries. We provide a locus of GIS communication and networking for an added 700 public health professionals and practitioners in other federal agencies, state and local health departments, academia and industry. In addition, there are many international representatives among us. Few developments in my professional life have been as rewarding as to experience this steady progression towards a GIS and public health family. This is the 30th edition of *Public Health GIS News and Information*. I thank each of you for your important contributions to this report which has received extensive recognition. There are those staff who have inspired me along the way with their sustained encouragement. I cannot list everyone but want to recognize the following colleagues: **Bill Henriques**, **Virginia Lee**, and **Janet Heitgerd** (ATSDR), **Tom Richards** (NCCDPHP), **Donna Stroup** and **David Williamson** (EPO), **Chet Moore** and **Allen Hightower** (NCID), **Owen Devine** (NCEH), **Jay Kim** (NIOSH), and **Jimmie Givens**, **Randy Curtin**, **Monroe Sirken**, and **Ed Sondik** (NCHS).

Charles M. Croner, Ph.D., Editor, **PUBLIC HEALTH GIS NEWS AND INFORMATION**, Office of Research and Methodology, National Center for Health Statistics <cmc2@cdc.gov>. Copyright Notice: This report is in the public domain but its contents are not to be altered or changed without prior written approval of the editor.

REMINDER: Please join us at NCHS for GIS Presentations on September 16 and October 21, 1999 and visit the 1999 GIS Day Web site at <http://www.gisday.com>