



CALIFORNIA TRACKING

The Newsletter of the California Environmental Health Tracking Program

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IN THIS ISSUE

One of the goals of Environmental Health Tracking is to translate data about the environment and environmentally-related diseases into useful information and communicate that information.

A powerful tool for analyzing and communicating environmental health information is Geographic Information Systems (GIS).

This issue offers a basic introduction to GIS, explores the uses of GIS in public health, and highlights an example of a community-based organization that is utilizing GIS with publicly available data as well as community generated data.

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A Picture is Worth a Thousand Words :: Using GIS to Analyze and Communicate Information

What is GIS?

GIS stands for Geographic Information Systems. This term refers to both the concept and technology that makes use of “layers” (figure 1) of information with geographic elements. GIS enables users to make better decisions based on better understanding of information in relation to a geographic location.

A key feature of GIS is the ability to map and analyze information. Mapping information to solve public health problems is not new. In 1854, [John Snow](#) - a local doctor in London - helped to solve the city’s cholera epidemic by mapping cholera deaths (figure 2) to locate the source of the outbreak.

Modern problems, such as the interaction between environmental hazards and diseases, are getting increasingly complex and involve much more data and sophisticated analysis of data. GIS technologies have provided the means to organize, manage, link, analyze, share, and communicate various types of data as well as great quantities of data.

What are its uses?

There are numerous applications of GIS in [various fields](#). GIS is providing the field of public health, especially disease surveillance and environmental monitoring, with important tools for analyzing and communicating information. GIS has risen to prominence in the past several years in public health with the recognition that agencies need to be more responsive to the needs of both the public and organizations that serve the public. Public health agencies rely heavily on data to understand problems and communicate information to policy makers, researchers, the public, the media and other stakeholders.

FIGURE 1: Examples of GIS Layers

Layers are information (usually contained in databases) that you can map or analyze using GIS.

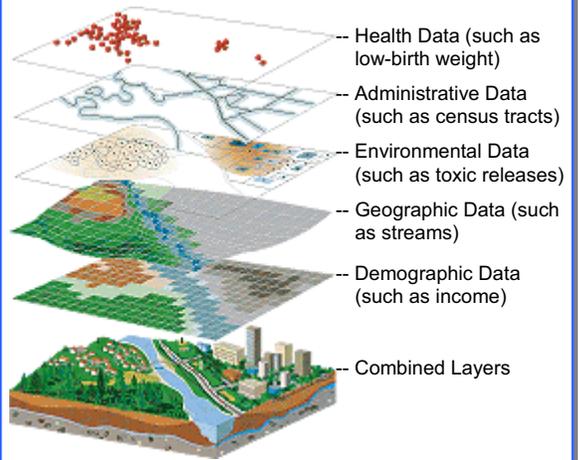
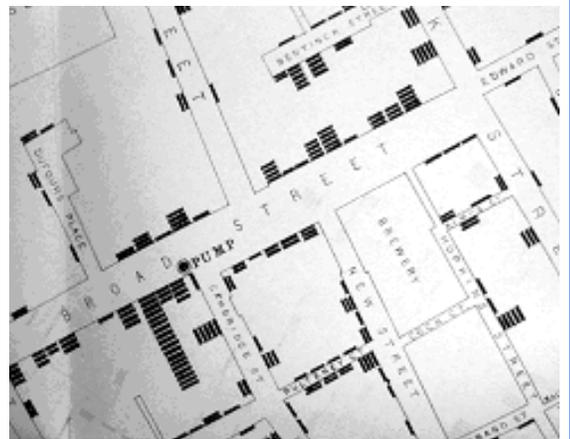


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FIGURE 2: Section of John Snow's map showing cholera deaths near the source pump



continued on page 2

Below are other uses of GIS in public health:

- Identifying geographic distribution of diseases;
- Analyzing disease trends and patterns over time;
- Documenting populations at risk;
- Monitoring distribution, time trends and quantities of pollution; and
- Integrating and coordinating health and environmental data.

Those actions then enable stakeholders to:

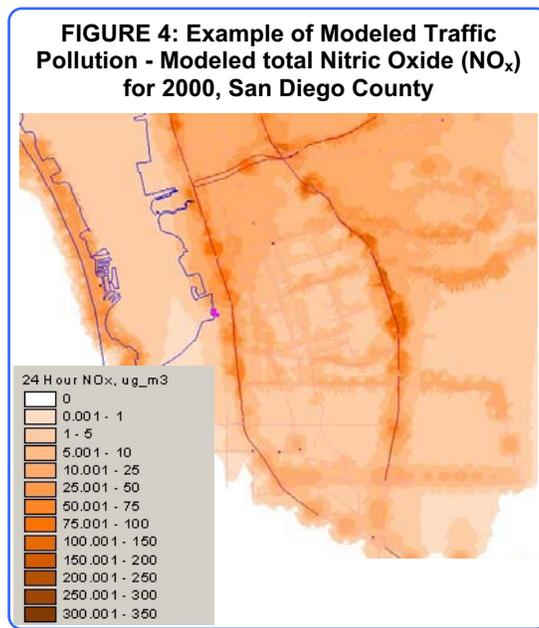
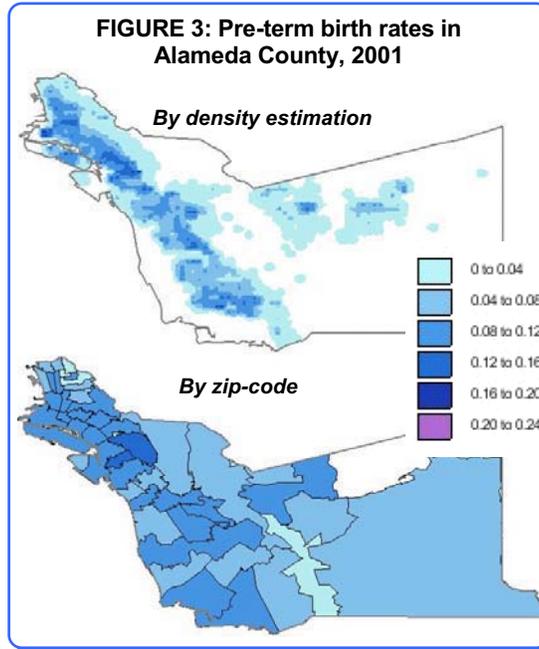
- Evaluate resource allocations and set priorities;
- Organize, mobilize, and advocate for policies and actions;
- Track outcomes of interventions and policies;
- Research health and environmental interactions; and
- Identify gaps and opportunities and plan programs and interventions.

What else can it do?

As a communication tool, GIS provides a method of simplifying complex information. For example clusters or “hotspots” of health conditions (figure 3) or pollution (figure 4) can be readily identified whereas a written description, or even tables, would not easily yield such information.

GIS maps can also display multiple layers (figure 1) of information – this can help to trigger questions about corresponding geographic relationships such as “are there higher rates of asthma near agricultural fields?” Because GIS is also a powerful tool for analyzing different layers of data, it can help to answer such questions. Web-based GIS applications are also enabling the examination and manipulation of data that is accessible using Internet browsers. An example of a web-based interactive interface with environmental health information is [Environmental Defense’s Scorecard](#).

GIS is also flexible in working at various scales, including neighborhood levels. GIS can be used to show individual data as points (John Snow example) or a collection of data as various shapes and shades (examples in figures 3 and 4). The latter is an example of emerging techniques that are helping to preserve confidentiality when it comes to dealing with health information.



Who is using it?

All federal health and environmental agencies and many state and local agencies are using GIS to perform public health functions. GIS will be a key component of an environmental health tracking system. The California Environmental Health Tracking Program is currently experimenting with GIS technologies to organize, manage, link, analyze, manipulate, and display data (example in figure 3).

Community right-to-know and environmental justice movements as well as efforts to democratize data have also spurred community-based organizations to map relevant neighborhood data and adopt GIS. Simply put, maps allow communities to better observe and understand what is going in their neighborhoods and GIS allows communities to create, manipulate, and interpret the maps. See story in page 3. One of the goals of environmental health tracking is to support and supplement community initiatives by providing better access to and understanding of environmental health information.

In summary, just as mapping did 150 years ago for Dr. Snow, GIS now makes it easy to translate data into useful information and

to present information quickly, efficiently and effectively. Today, GIS also enables users to go beyond simply mapping data to organizing, managing, linking, and analyzing data. Furthermore, GIS engenders public participation and empowerment of a broader group of stakeholders beyond the public health arena. ❖

Oaktown Datahouse :: Information Networking Forum of Oakland (InfoOakland)

Background:

In March 2002, a group of Oakland organizations came together to form the [Information Networking Forum of Oakland](#). InfoOakland, as the collaborative is known, promotes equity and empowerment of residents and organizations in low-income neighborhoods and communities of color in Oakland and the region through increased access to good data, assistance in gathering and analyzing data, and collaboration in using data as a tool for organizing and positive social change.

InfoOakland recognizes that good information can be powerful and that data can be used in many powerful ways. They strive to increase the types, and accessibility, of data available to community-based organizations and residents. Future plans include incorporating other data, including environmental health data. InfoOakland and the

California Environmental Health Tracking Program are currently exploring collaborative opportunities for information sharing and communication. In addition, InfoOakland is working to build community capacity and inspire more use of data through trainings and collaborations.

Oaktown Datahouse:

One of InfoOakland's projects is an interactive mapping program that allows users to visualize data and create printable maps. The Oaktown Datahouse currently contains a number of citywide data, including Oakland demographics (from the 2000 US Census), environmental conditions, and health, educational and recreational resources. See a screenshot of the interactive map below.

Outreach and Training:

InfoOakland plans to build community capacity through trainings on how to use the

Datahouse and how to use data in advocacy campaigns. InfoOakland offers free trainings on how to use the Oaktown Datahouse as a resource for community action. These trainings present a thorough introduction to the Datahouse. Trainings are hands-on, and held in local computer centers. All trainings contain three educational components: an introduction to the Datahouse; technical instruction on how to navigate and use the Datahouse; and an instruction on using data and information for social change. A fourth component of the trainings is a feedback segment to let InfoOakland know what users find useful about the Datahouse as well as what improvements should be made.

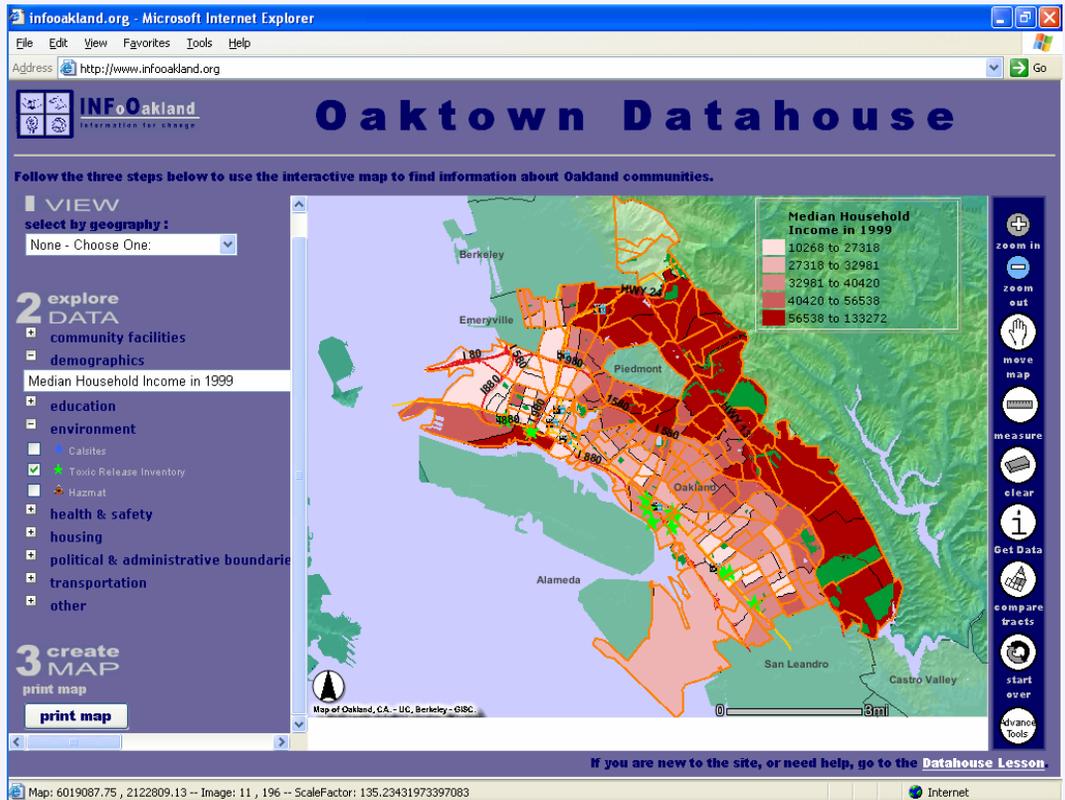
Training sessions are also thematic (relating to a specific issue, such as gentrification) or geared toward a certain user group (such as youth). ❖



A new and improved version of the InfoOakland's website will come online this summer.

InfoOakland is currently scheduling demonstrations of the site and hands-on trainings. To schedule a demonstration or training for your organization contact InfoOakland's Coordinator, Jeremy Hays at jeremyh@urbanstrategies.org or at (510) 463-2717.

Visit www.InfoOakland.org



GIS Resources...

Links to commonly used, comprehensive, and/or innovative GIS interfaces on the Internet:

- <http://63.192.169.198/index.asp>
- <http://datawarehouse.hrsa.gov/DWOnlineMap/>
- <http://hud.esri.com/egis/>
- <http://toxmap.aquilent.com/toxmap/main/index.jsp>
- www.epa.gov/enviro/wme/
- www.golsandiego.net/website/border_health/viewer.htm
- www.scorecard.org
- www3.cancer.gov/atlasplus/

Links to more information and resources on GIS:

- www.atsdr.cdc.gov/gis/conference98/links/links.html
- www.cdc.gov/nchs/gis.htm
- www.cdc.gov/ncidod/eid/vol2no2/clarke.htm
- www.esri.com/industries/health/business/publichealth.html
- www.gis.com
- www.gisc.berkeley.edu
- www.greeninfo.org/index.html
- www.pacificsites.com/%7Ecbrooks/gis1.shtml
- www.uiowa.edu/~geog/health/index.html
- www.who.int/csr/mapping/gisandphm/en/

Disclaimer: Links to non-CEHTP resources are provided solely as a service. These links do not constitute an endorsement of these resources and none should be inferred. CEHTP is not responsible for the content of the individual organization Web pages or documents found at these links.

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