

The Role of GIS in the Environmental Public Health Tracking Network

ESRI Federal User's Conference

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Overview

- What is the Tracking Network
- Challenges Faced by Tracking
- Ways Tracking Uses GIS
- Current Technology of the National Portal
- User Testing
- Grantee Examples



Bridging America's Environmental Health Gap

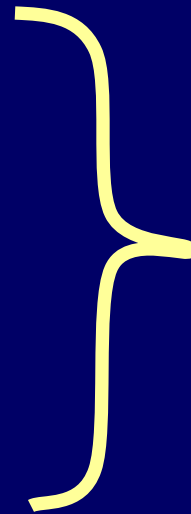
“Infrastructure is rarely at the top of the public's agenda, yet it is essential to improve health care in the United States. Unless you can pull together environmental data and measures of population health, fundamental questions won't be asked and can't be answered.”

Tom Burke, PhD
Johns Hopkins University



How do environmental hazards relate to health effects in America?

- Limited data
- Limited tools
- Limited capacity
- Limited standards



Lack of ability to track and quantify disease burden and prevalence of hazard and exposure

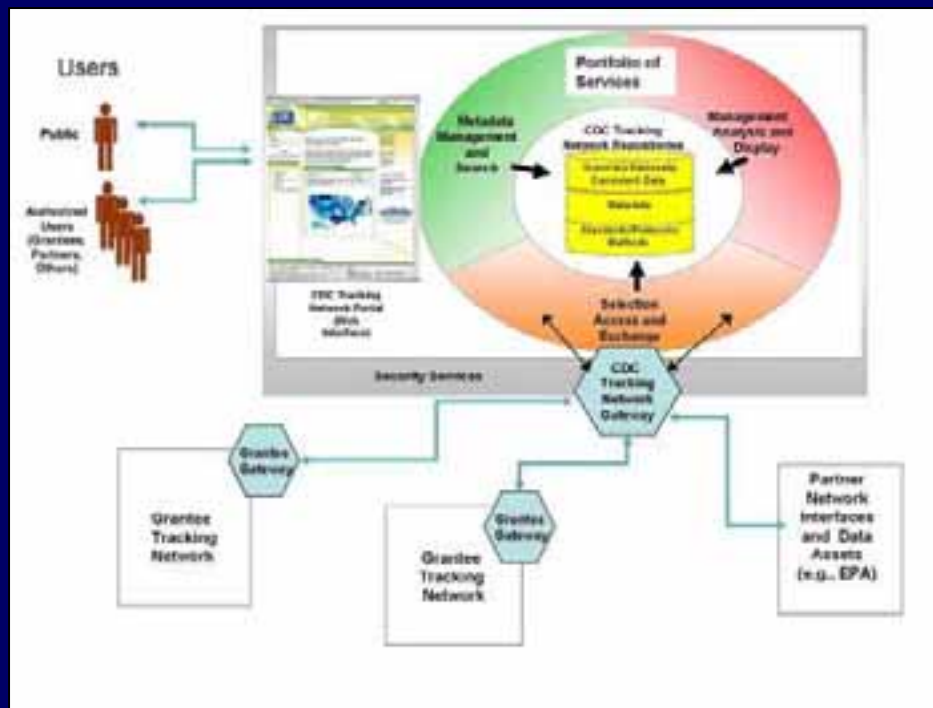
Answer = We don't know

Environmental Public Health Tracking: Background

- Pew Environmental Health Commission
 - 2001 report issues a call for action to fill America's environmental public health gap
- CDC convened tracking network workgroups 2001-2002
- Environmental Public Health Tracking Program initiated in 2002

Tracking Network

A web-based information system that exists at the local, state, and national level that serves the public, environmental public health agencies, health care providers and researchers



Functions:

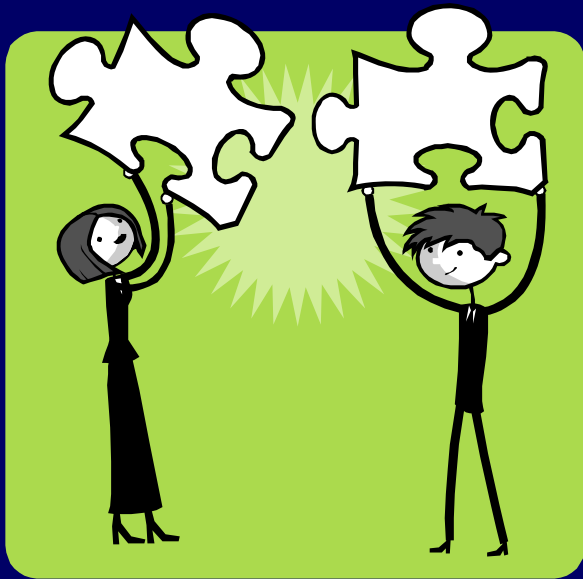
- Provide Nationally Consistent Data and Measures
- Describe and Discover Data
- Exchange Data
- Provide Data Management and Analysis Tools
- Inform and Interact with the Public

Partners in Planning and Development

- Environmental Protection Agency
- State and local health departments
- Universities
- National public health and environmental health professional organizations
- Advocacy groups
- Other CDC Programs
- Other Federal Agencies:
 - US Geological Survey
 - National Aeronautics and Space Administration
 - National Cancer Institute



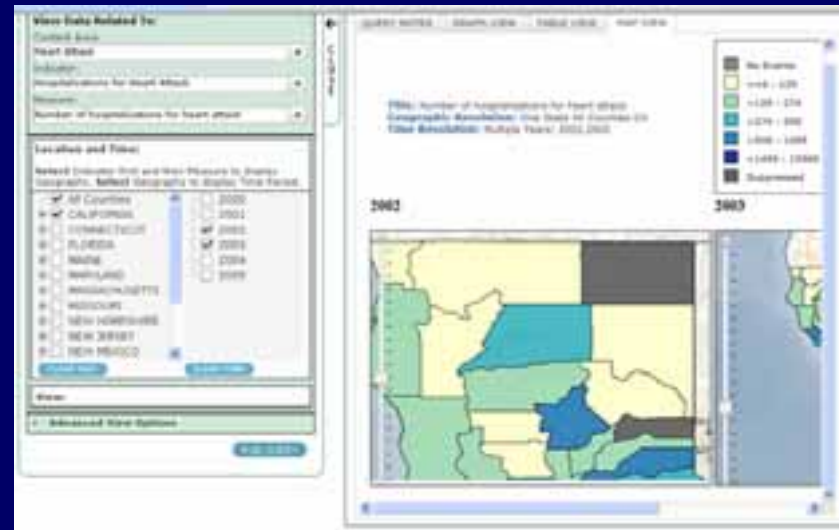
Putting the Pieces Together



- Health Data
 - Confidentiality Issues
 - Higher level of aggregation
- Environmental Data
 - Range of exposure
 - Impact of exposure

Barriers and Challenges

- Data Confidentiality Issues
- Suppression
- Missing Data versus zero counts
- Unstable rates
- Smoothing



Tracking and GIS

healthyGIS

ESRI • Spring 2009

GIS for Health and Human Services

New CDC Environmental Public Health Tracking Network Includes Spatial Analysis Tools

By Alex Charleton, MPH, Public Health Analyst, Environmental Health Tracking Branch, Centers for Disease Control and Prevention

The Centers for Disease Control and Prevention (CDC) is launching the National Environmental Public Health Tracking Network (Tracking Network) that provides integrated health and environmental data useful for monitoring, reporting on, and eventually reducing the burden of environmentally related illnesses. Environmental public health tracking comprises the ongoing collection, integration, analysis, and dissemination of data from environmental hazards monitoring, human exposure tracking, and health status surveillance. Spatial analysis tools are an essential component of Tracking Network for linking environmental

hazards and potentials whose health effects Tracking Network provides a bridge between the information silos of environmental and health data. It is important to understand how spatial and temporal trends in health outcomes and environmental factors interact and influence each other. Because understanding these relationships can better inform public health actions designed to improve community health. Factors critical to Tracking Network are the adoption of standards to provide consistent data and measures from state and national data systems (e.g., population data from the U.S. Census) and the provision of

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GIS helps create awareness in public health concerns in the City of London, Ontario	p4
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information access while adhering to health data privacy considerations.

In September 2008, the Pew Environmental Health Commission recommended the provision of technical resources to state and local public health agencies to improve their capacity to evaluate community exposures and conduct intermit-

ted pattern about the health of their environment. The report called for the establishment of the national tracking network. In 2002, Congress appropriated funds for the CDC to develop a national environmental public health tracking network and build state and local environmental health capacity.

In 2004, the program invited 17 states and local partners to develop and implement Tracking Network. Additionally, the program funded five academic partners as valuable resources for the program and its partners. As tracking network matures, additional states, local jurisdictions, United States territories, and tribal jurisdictions are expected to become part of it.

A number of challenges were identified in the process of establishing nationally consistent data

continued on page 8



Seventeen states and local partners participated in the development and implementation of the Environmental Public Health Tracking Network.

Communicating a Message



GIS is important to Tracking

- Helps users find and query data
- Helps users understand data with map displays
- Helps advanced users correlate environmental exposure and health effects data

Driving Queries

National Environmental Public Health Tracking Network

Home | About Tracking Program | State & Local Tracking Portals | Indicators & Data | Secure Portal

Tracking A-Z Index: A B C D E F G H I J K L M N O P Q R S T U V W X Y Z #

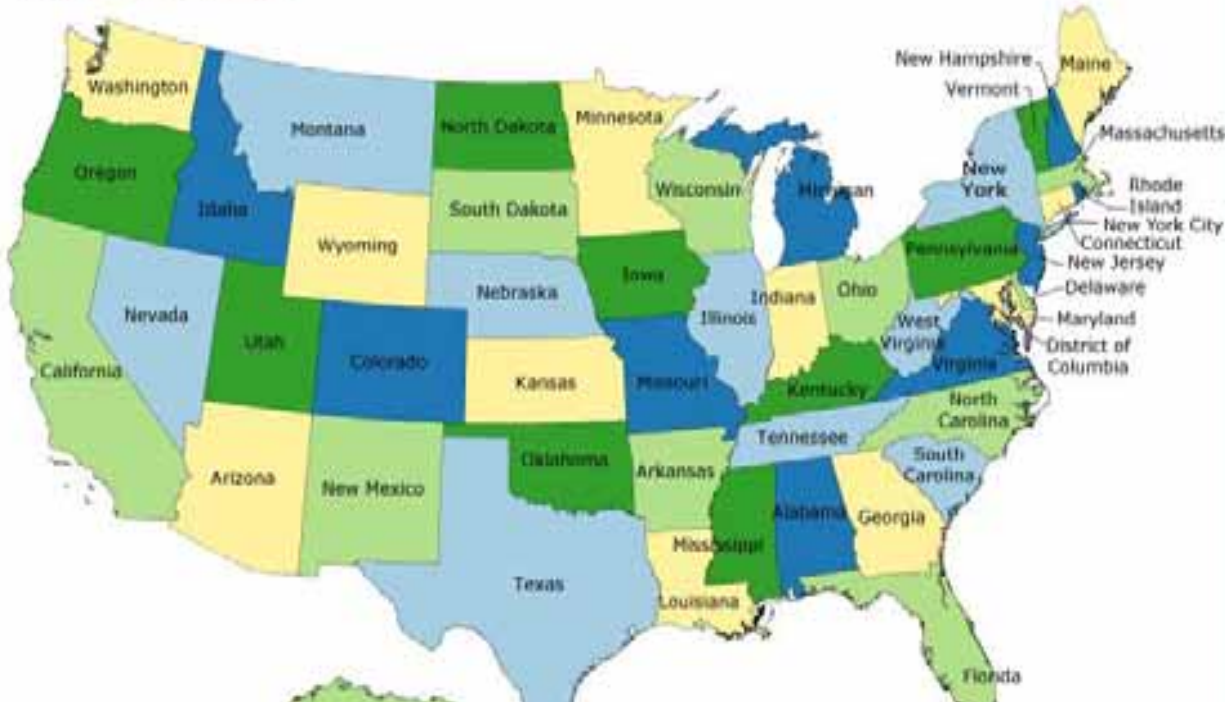
Home > Info By Location

GLOSSARY | CDC A-Z | TRACKING A-Z

Environments | Health Effects | **Info by Location**

Query and Results

Step 1: Select a State.



The map shows the following color coding for states:

- Green:** Oregon, North Dakota, Iowa, Kentucky, Tennessee, Alabama, Georgia, Florida, South Carolina, North Carolina, Virginia, West Virginia, Maryland, District of Columbia, Delaware, New Jersey, Connecticut, New York City, New York, Massachusetts, Rhode Island.
- Blue:** Montana, Wyoming, Nebraska, Kansas, Missouri, Illinois, Indiana, Ohio, Pennsylvania, New Hampshire, Vermont, Maine.
- Yellow:** Washington, Oregon, Nevada, California, Arizona, New Mexico, Texas, Louisiana, Mississippi, Alabama, Georgia, Florida, South Carolina, North Carolina, Virginia, West Virginia, Maryland, District of Columbia, Delaware, New Jersey, Connecticut, New York City, New York, Massachusetts, Rhode Island.

Page Options

Text size: [S](#) [M](#) [L](#) [XL](#)

- Printer-friendly version
- Get Email Updates
- Bookmark and Share

Tracking Hot Topics

- New Tracking states announced
- Asthma and the Flu
- Chinese Drywall

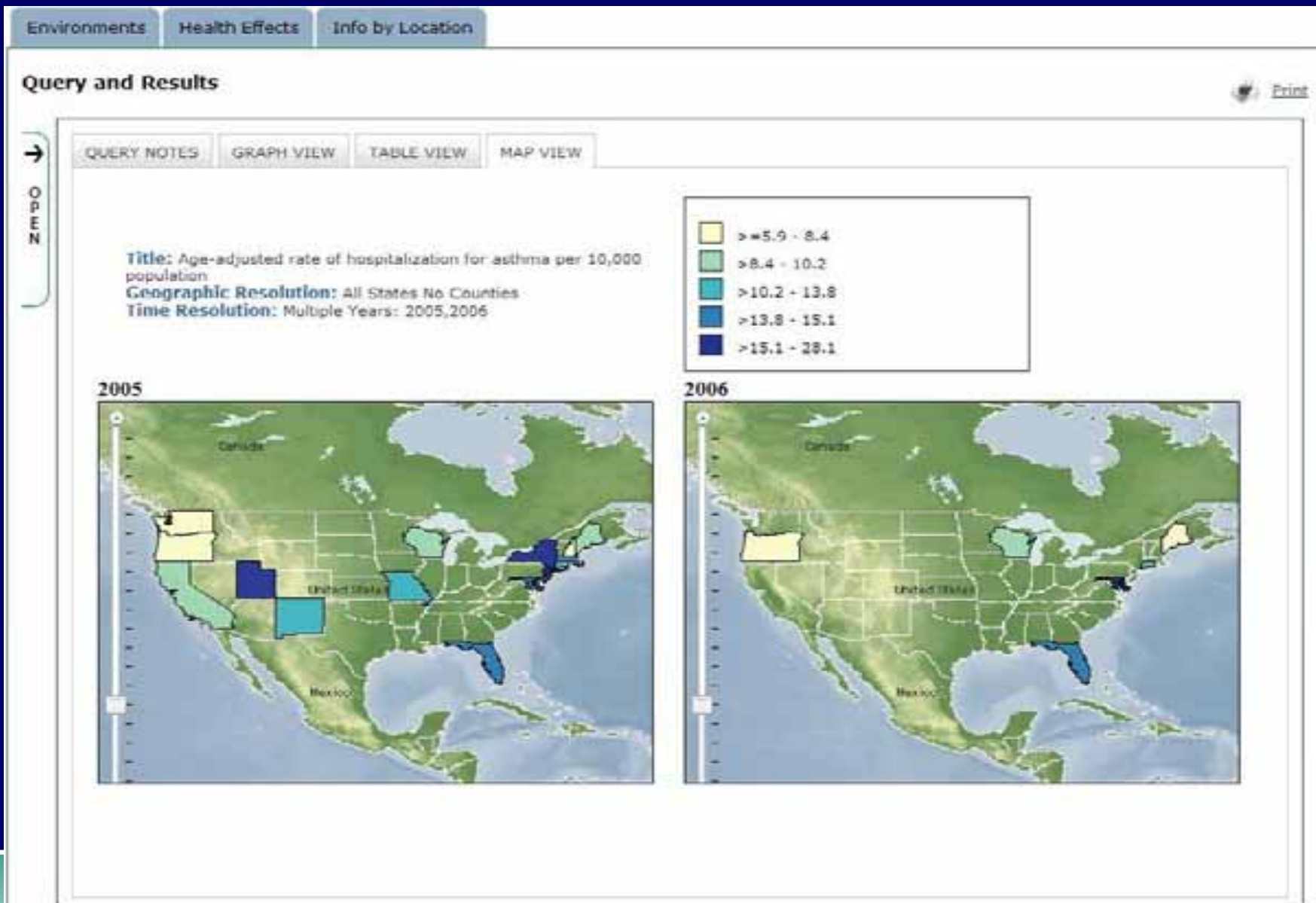
Resources

- Communication Features
- Document Library
- Quick Reports
- Technical Notes

Contact Us

CDC Phone: 800-CDC-INFO
800-232-4636
888-232-6348 (TTY)
Tracking Program:
tracking@support@cdc.gov

Display Data



Display Data

Environments Health Effects Info by Location

Query and Results

Print

View Data Related To:

Content Area:
Well Water

Indicator:
Levels of Contaminants in Domestic (self-supplie

Measure:
Number of samples grouped by concentration lev

Location and Time:

Select Indicator first and then Measure to display Geography. Select Geography to display Time Period.

All States None

CALIFORNIA

CONNECTICUT

FLORIDA

MAINE

MARYLAND

MASSACHUSETTS

MISSOURI

NEW HAMPSHIRE

NEW JERSEY


NEW MEXICO

CLEAR GEO CLEAR TIME

View:

+ Advanced View Options

QUERY NOTES GRAPH VIEW TABLE VIEW MAP VIEW



Legend:

- Green: Samples greater than or equal to CAL but less than MCL
- Blue: Samples less than CAL
- Red: Samples greater than or equal to MCL

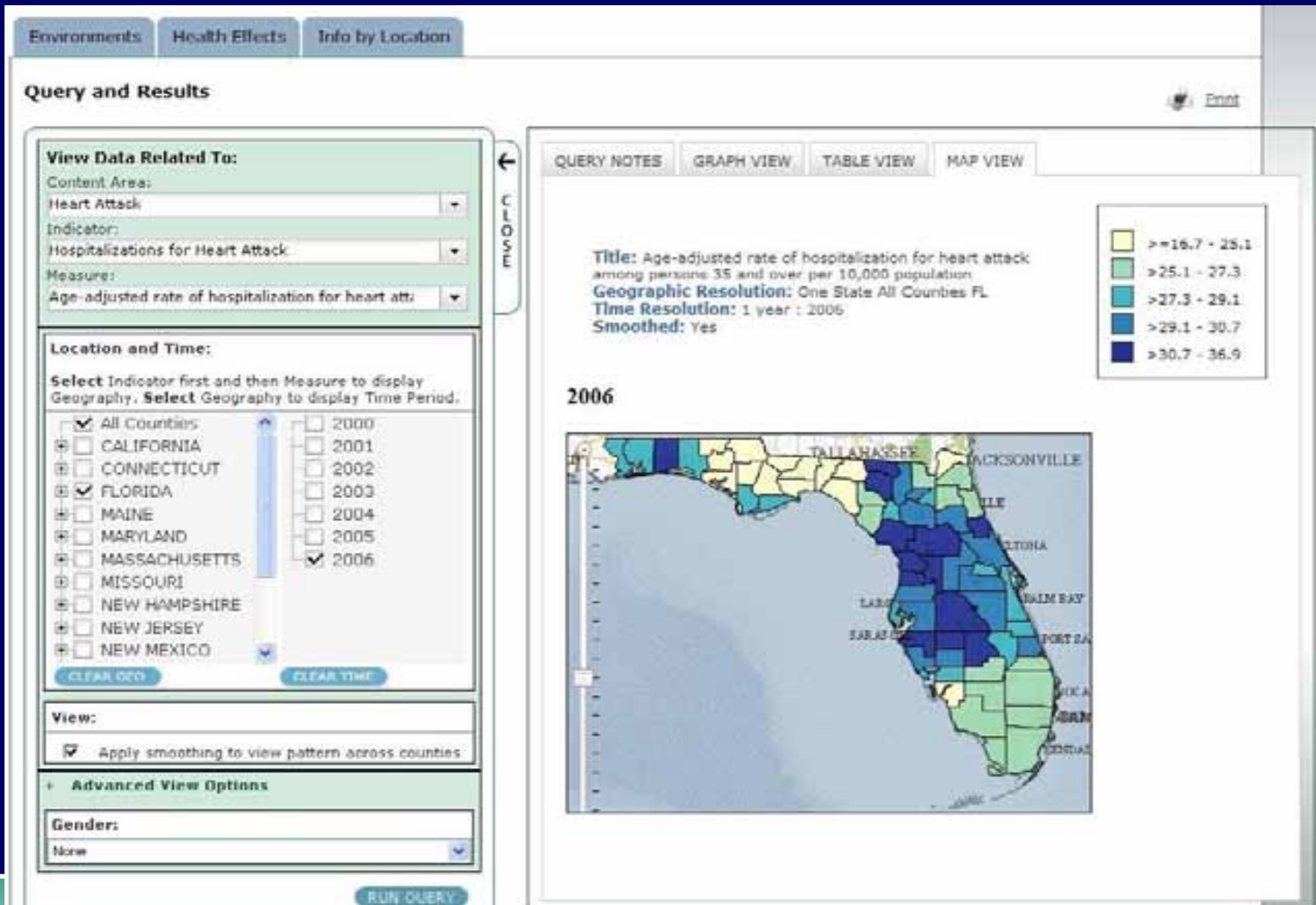
Title: Number of samples of domestic (self-supplied) wells grouped by concentration levels for Arsenic

Geographic Resolution: All States No Counties

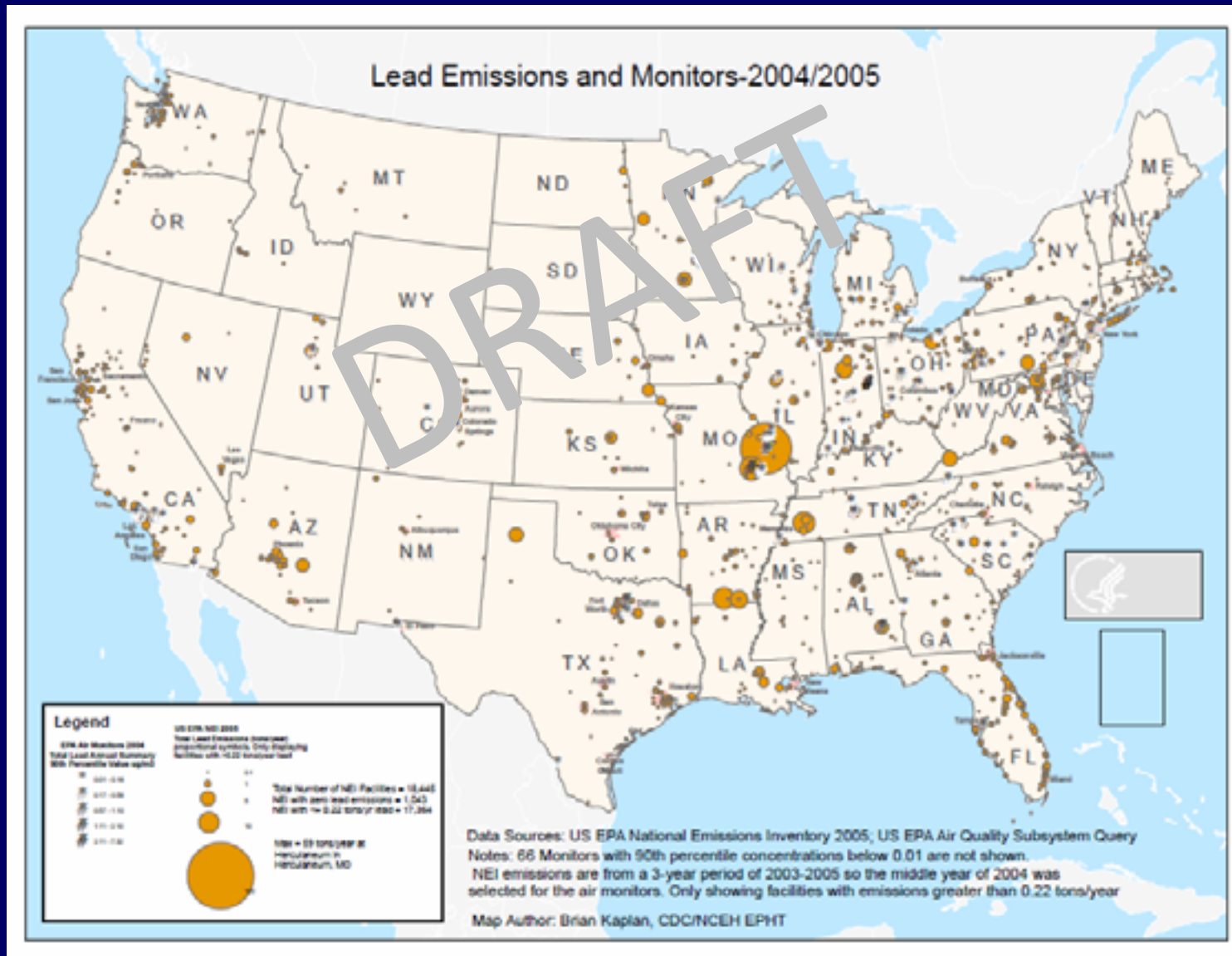
Time Resolution: None

CAL: Common assessment level
MCL: Maximum contaminant level

Display Data



Other Uses of Geospatial Data



Correlate Data

- Relating the environmental hazards on our network to the possible health outcomes
- Not achieved yet
- Hope to accomplish on the Tracking Secure Portal

Technology on the National Portal

- Business Objects Web Intelligence generate tables and graphs
- Arc GIS Server 9.x used to generate maps
- Weblogic and Java generate our static and dynamic pages
- Windows servers and Microsoft SQL servers for database engine

User Testing

- Alternate views of information
- Maps and charts are necessary
- Image should not fill the screen
- Interact with data tools and displays



User Testing

- How Did We Do?
 - Well Received
 - Highly Credible
- Identify Needs and Future Enhancements
 - Query Challenges
 - Mapping and Charting Enhancements
 - Response Layout



Grantee Examples

- California
- Missouri
- New York City



MO EPHTN Lead Indicator Interactive Map

State of Missouri

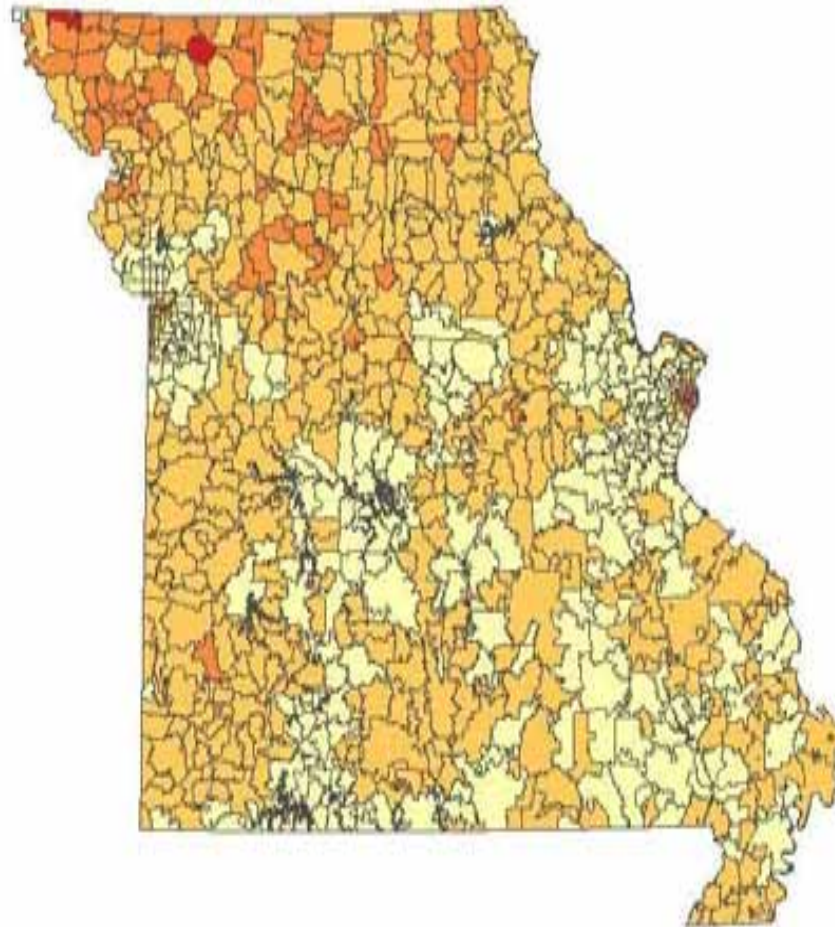
DEPARTMENT OF HEALTH AND SENIOR SERVICES

[Toggle Layers/Legend](#) | [Help](#)



LAYERS

- All Layers
 - Base Layers
 - Interstates
 - MO Senate
 - MO House
 - Zip Code
 - Cities and Towns
 - County
 - Lead Indicator 2004 by Zip Code
 - Risk 2004
 - 1 (0 - 20% pre-1950 Housing)
 - 2 (21 - 50%)
 - 3 (51 - 75%)
 - 4 (76 - 100%)
 - Total Births 2004
 - 0
 - 1 - 30
 - 31 - 100
 - 101 - 500
 - 501 - Greater
 - Total Tested 2004
 - 0
 - 1 - 10
 - 11 - 50
 - 51 - 200
 - 201 - Greater



Missouri Department of Health and Senior Services, 2008

Zoom In



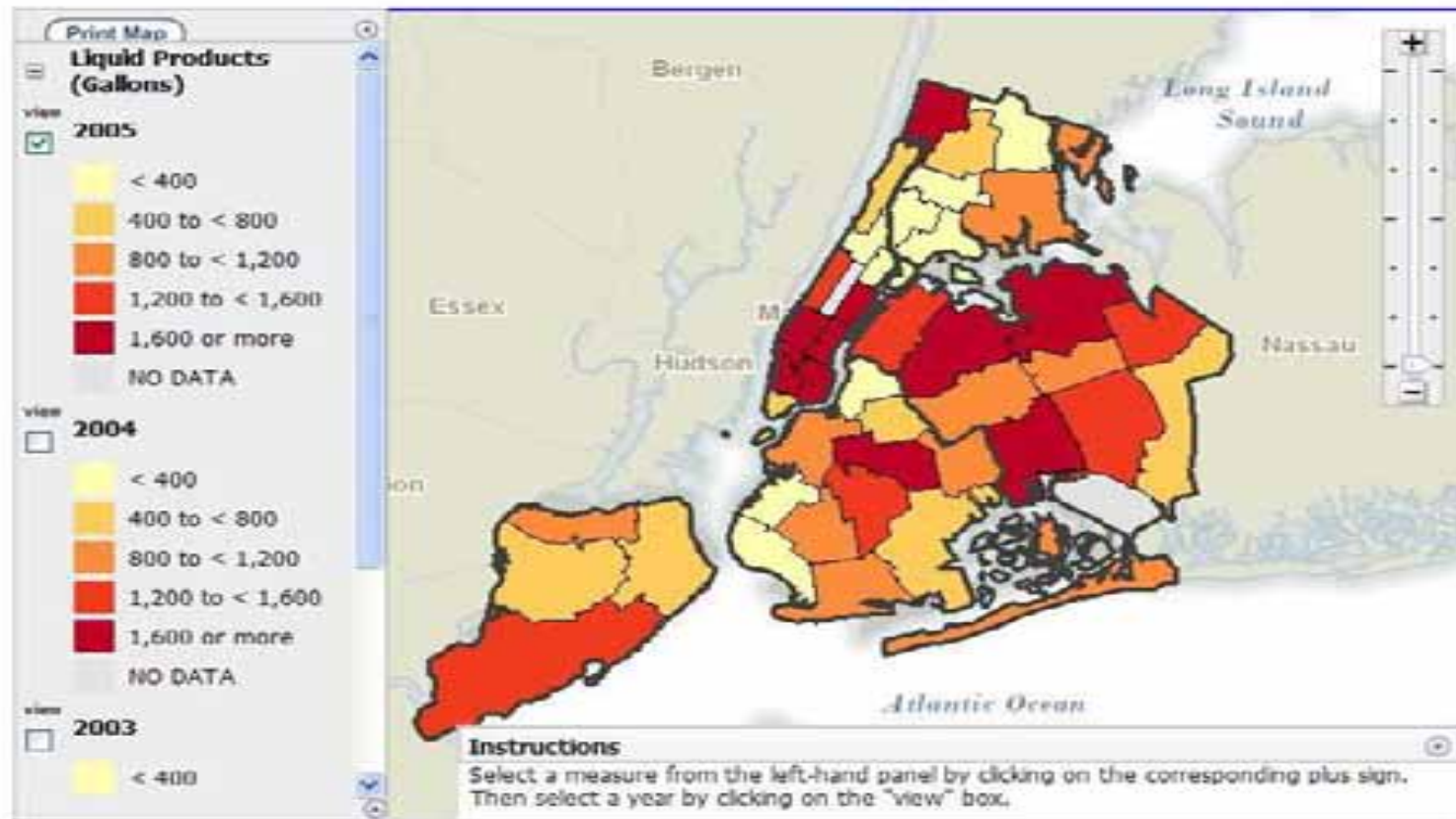
<< Back

Environmental Public Health Tracking Portal

Help

Landing Page >> Select a Topic >> Select an Indicator >> Map It >>

Commercial Application of Insecticides by Neighborhood (UHF 42)



Overview

Show Streets

The Big Picture

- A network that is...
 - Sustainable
 - Scalable
 - Standards-based
 - Georeferenced
 - Meta data driven
 - Publicly accessible



Summary

- Tracking includes environment and health
- Data Creates Challenges
- GIS helps overcome challenges