The Environmental Public Health Tracking (EPHT) in New York State

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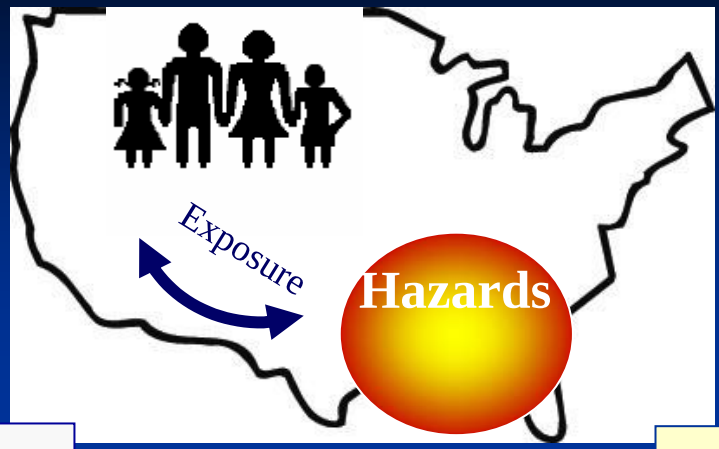
What is EPHT?

- Integration of Surveillance of Health Outcomes with Surveillance of Environmental Hazards and Exposures
- Opportunity to Link Environmental and Health Data at Local, State, and National Level
- Facilitate Identification of Problems and Effective Solutions to Reduce the Burden of Environmentally-Related Diseases

What is Environmental Public Health Tracking?



State and National Data Collection Systems

- Environmental Hazards Tracking
- Environmental Exposure Tracking
- Health Effects Tracking

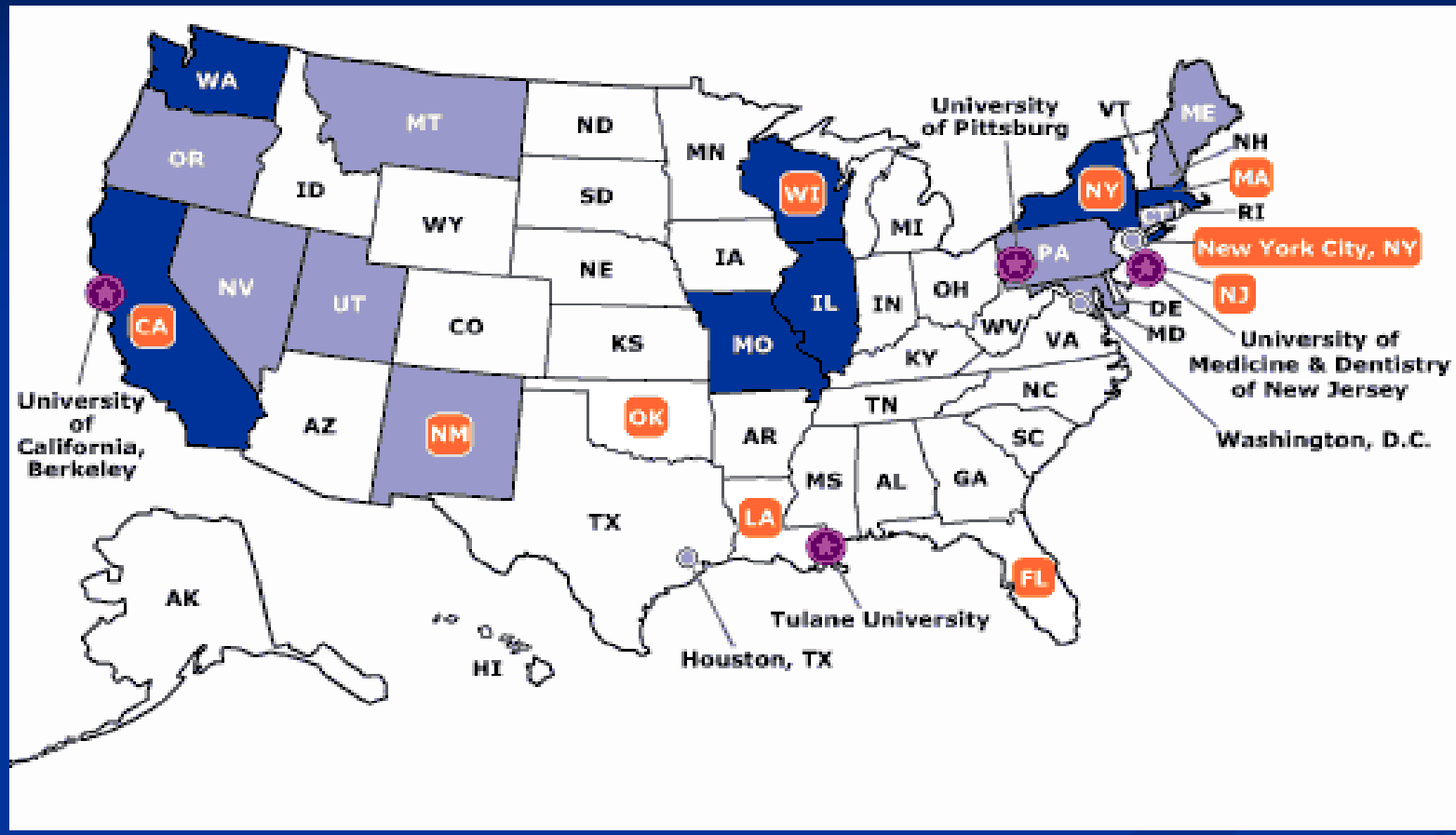
Public Health Actions

- Track health effects, exposures, hazards and target interventions
- Monitor change in health outcomes before and after interventions
- Raise awareness of environmental health issues
- Guide research initiatives

Integrated Environmental Health Tracking, Analysis, Evaluation And Dissemination

CDC

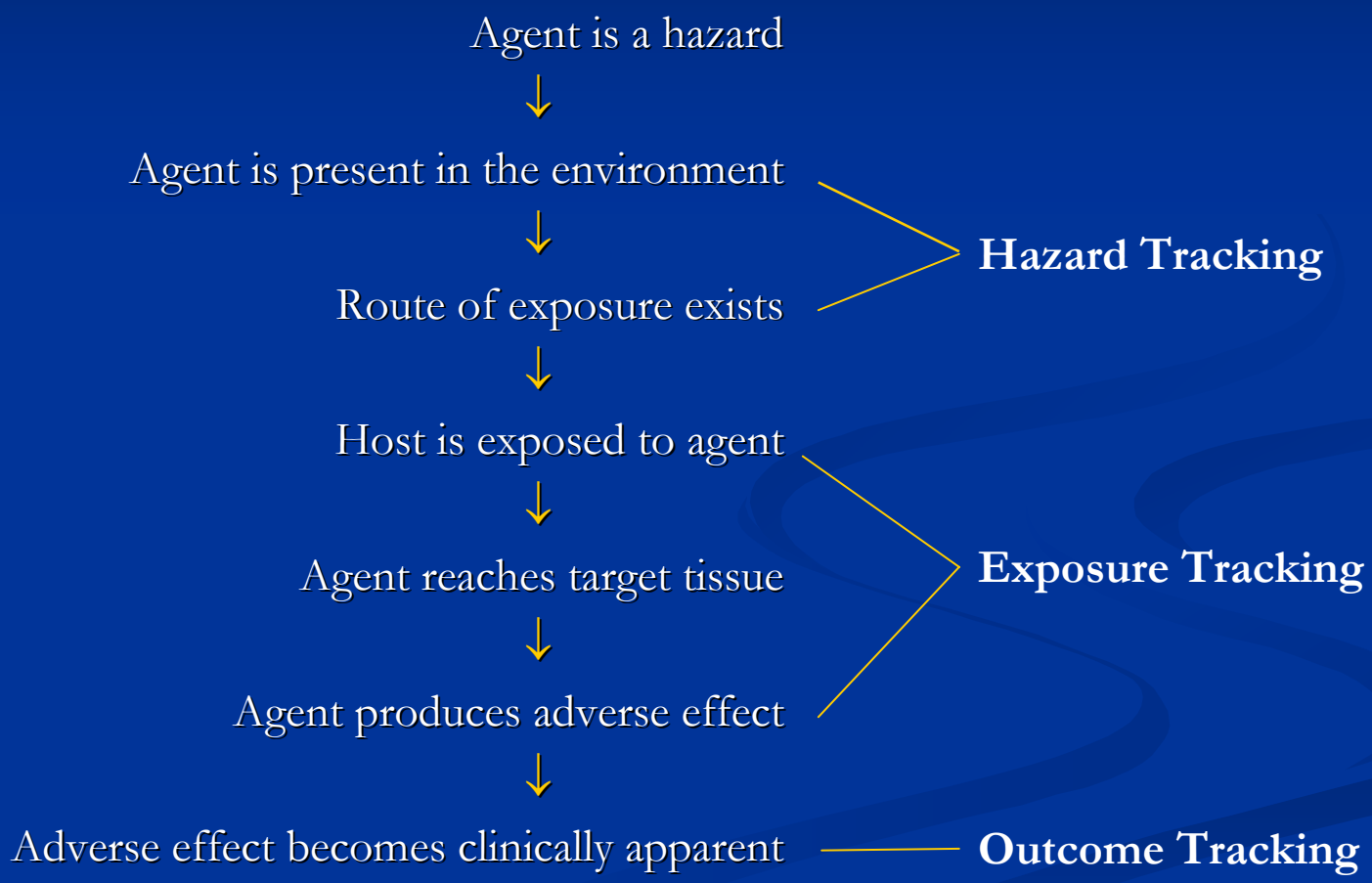
CDC-Funded EPHT Projects



- Planning & Capacity Building Activities
- Infrastructure Enhancement & Data Linkage Demonstration Projects (with a planning & capacity building component)
- Academic Partners for Excellence
- Data Linkage Demonstration Projects

CDC EPHT Website

Three Types of Public Health Tracking for Environmental Health Threats



Adapted from Thacker, et al., (1988)

NYS EPHT Program

- Evaluated Existing Environmental Hazard, Exposure, and Health Data Sets
- Developed Pilot Surveillance System, Incorporating Several Data Sets
- Currently Conducting Demonstration Projects, Linking Data Sets
  - Air Quality, Respiratory and Cardiovascular Disease

EPHT Surveillance System – Health Data

- Hospitalization Discharges (SPARCS)
  - Asthma
  - Cardiovascular Disease (Myocardial Infarction, Stroke, etc)
- Mortality (Death Certificates)
  - Cardiovascular Disease
- Birth Outcomes
  - Birth Weight & Pre-term Birth (Birth Certificates)
  - Birth Defects (Congenital Malformations Registry)
- Geographic Scale
  - ZIP Code
  - Residential Address

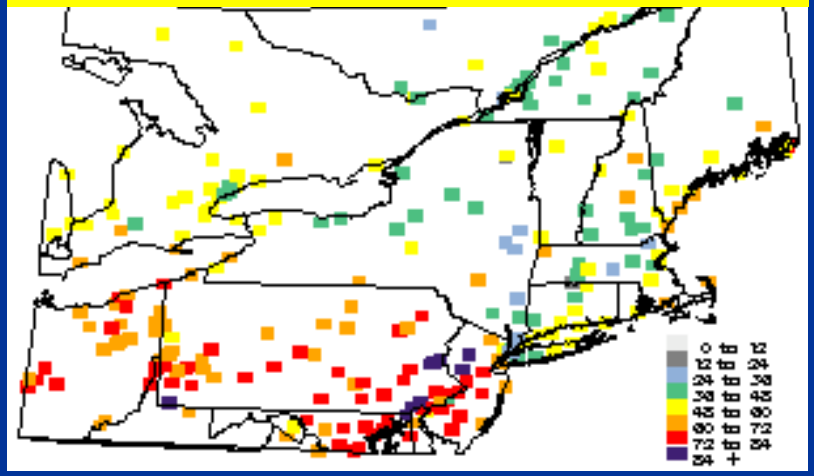
EPHT Surveillance System – Environmental Hazard Data

- Air Quality
  - Primarily $PM_{2.5}$ and Ozone
  - Sources
    - NYSDEC Ambient Air Quality Monitoring Network
    - Interpolated Data from EPA
    - Modeled Data from EPA
      - Community Multi-scale Air Quality (CMAQ)
      - CMAQ Combined with Monitoring
  - Geographic Scale
    - Distance to Nearest Monitor
    - Grid Cells (4 km to 36 km)
    - Zip Code

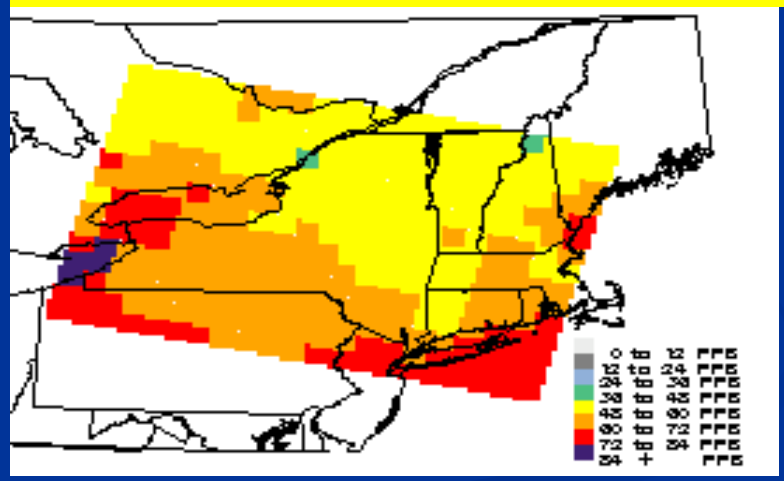
Four Air Characterization Methods

Ozone, June 11, 2001

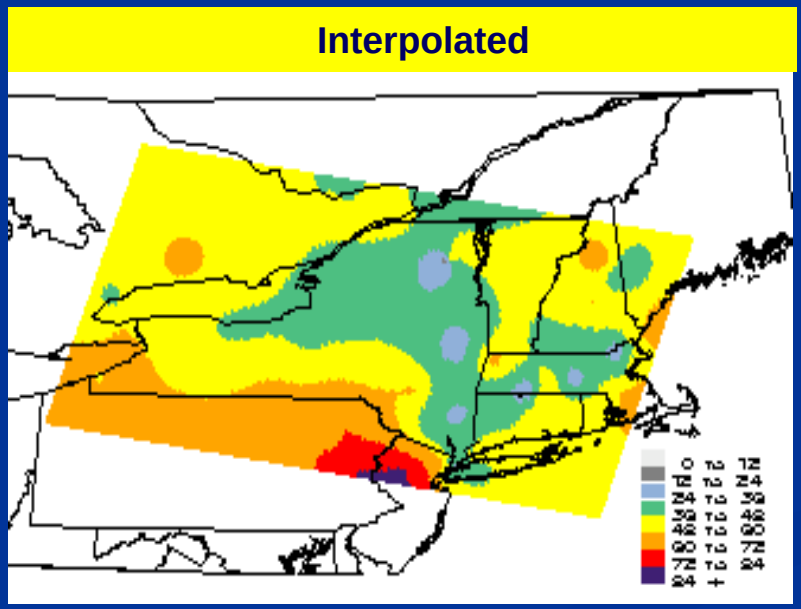
Ambient monitors



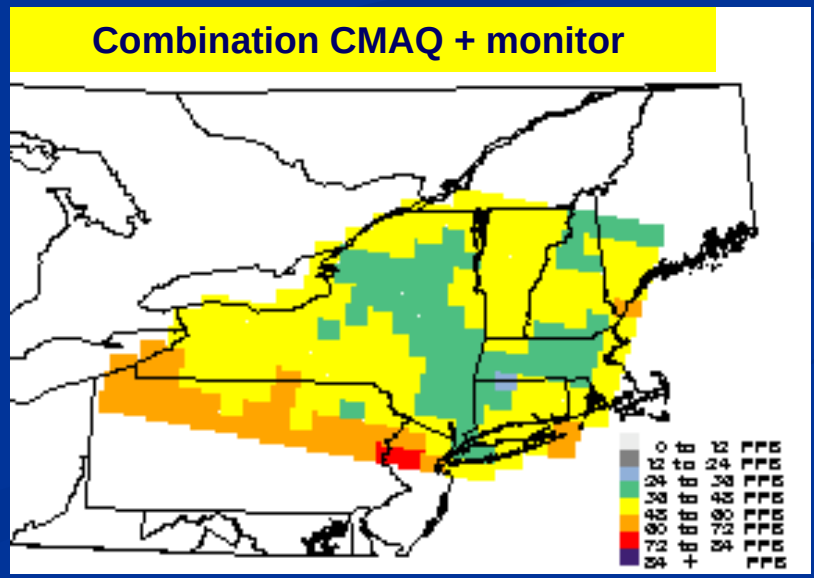
Community Multiscale Air Quality (CMAQ)



Interpolated



Combination CMAQ + monitor



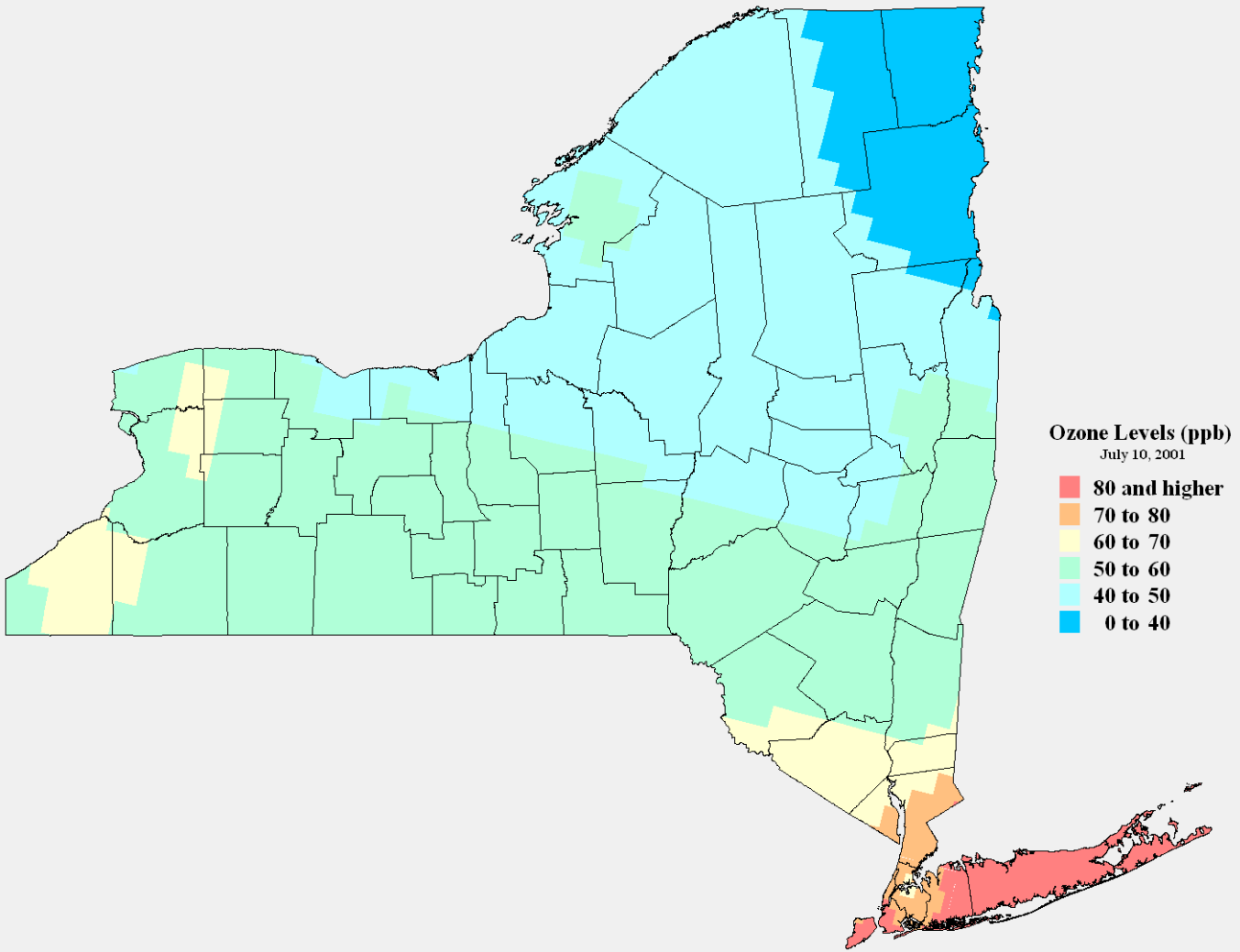
Insets provided by EPA

Potential Uses of the EPHT Surveillance System

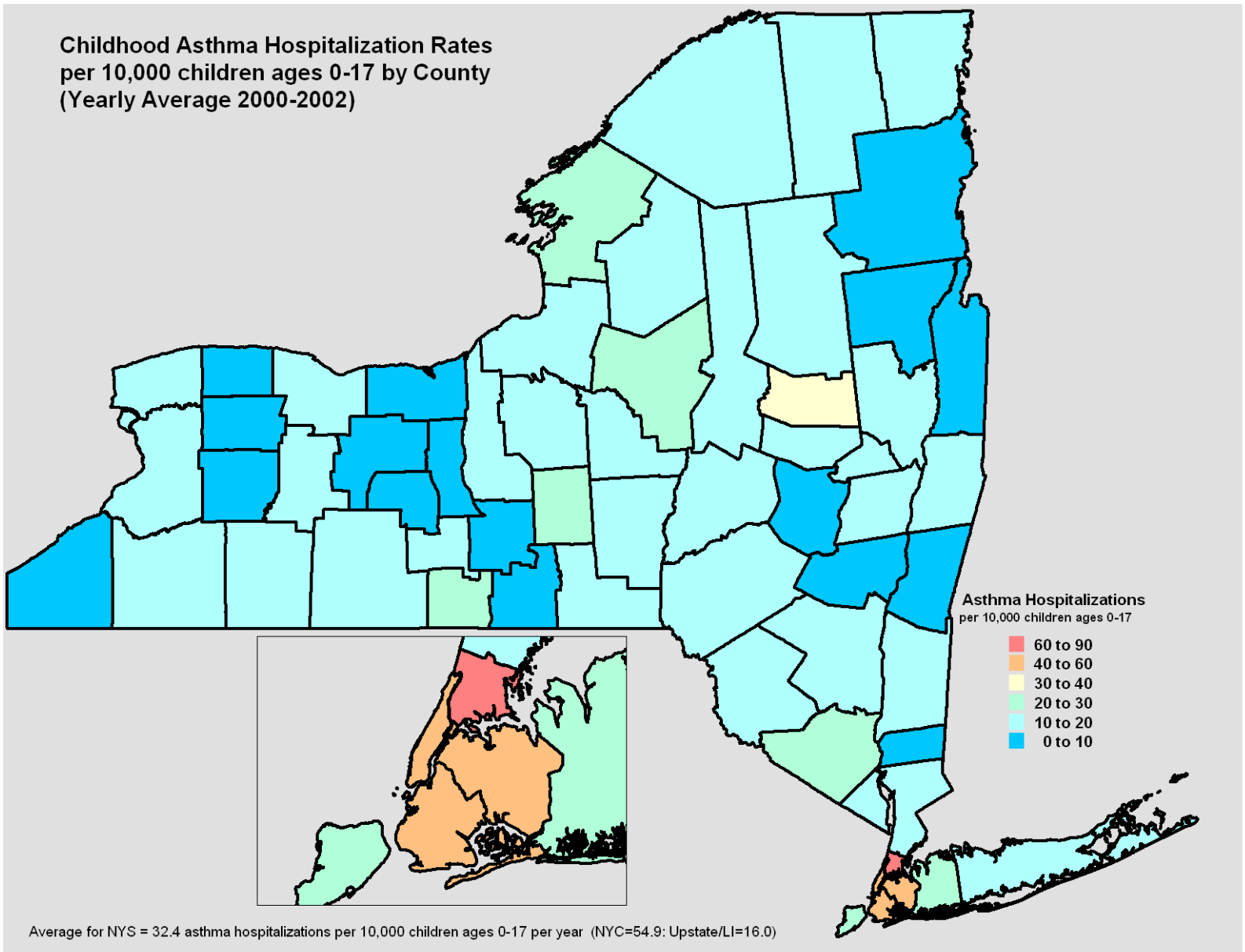
1. Respond to Queries about Environmental Hazards & Health Outcomes
2. Identify Patterns and Trends
3. Track Health Outcomes Before and After Interventions
4. Identify Data Quality Problems
5. Provide Measures of Association
6. Generate Hypotheses
7. Facilitate Research

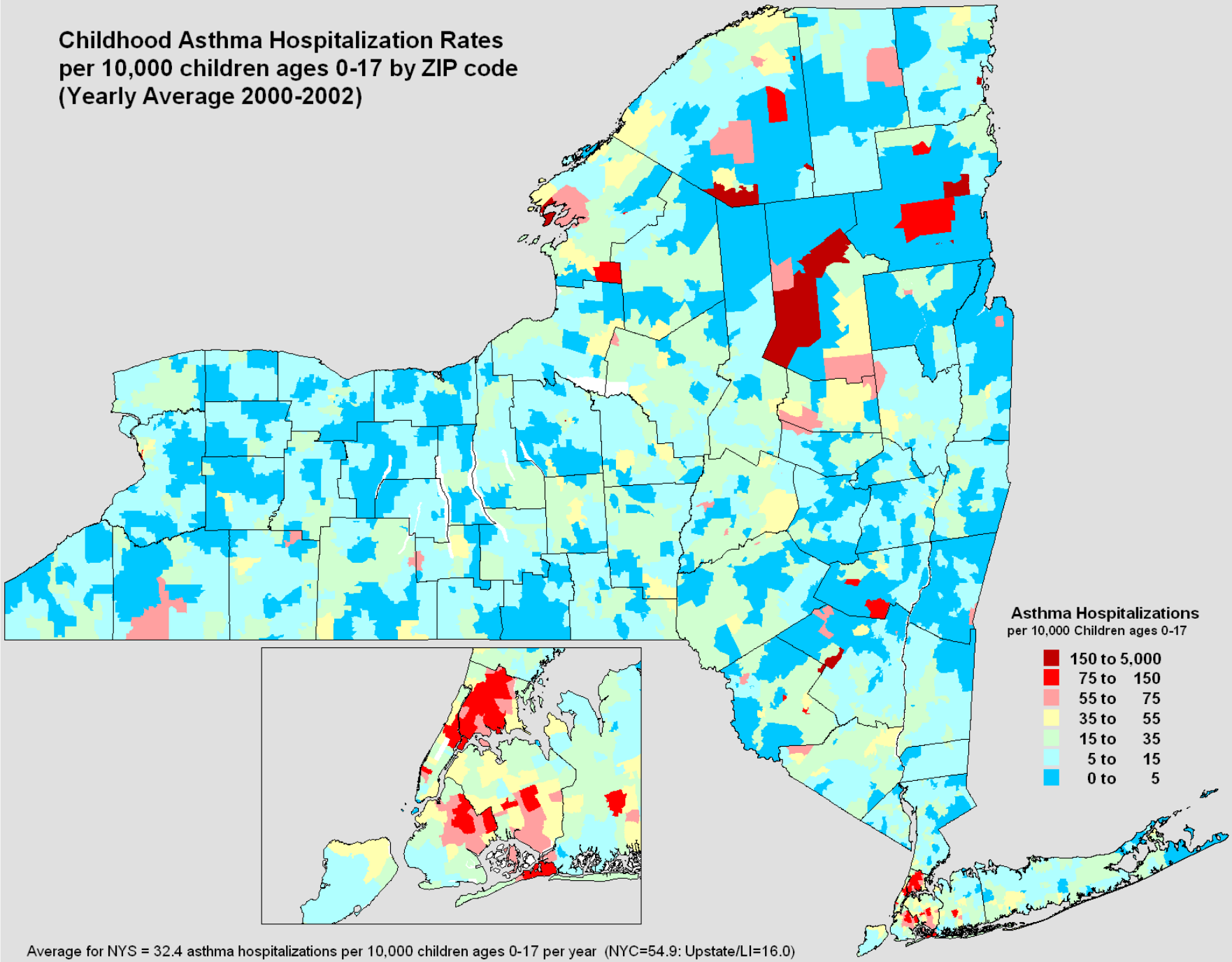
Questions about Hazards

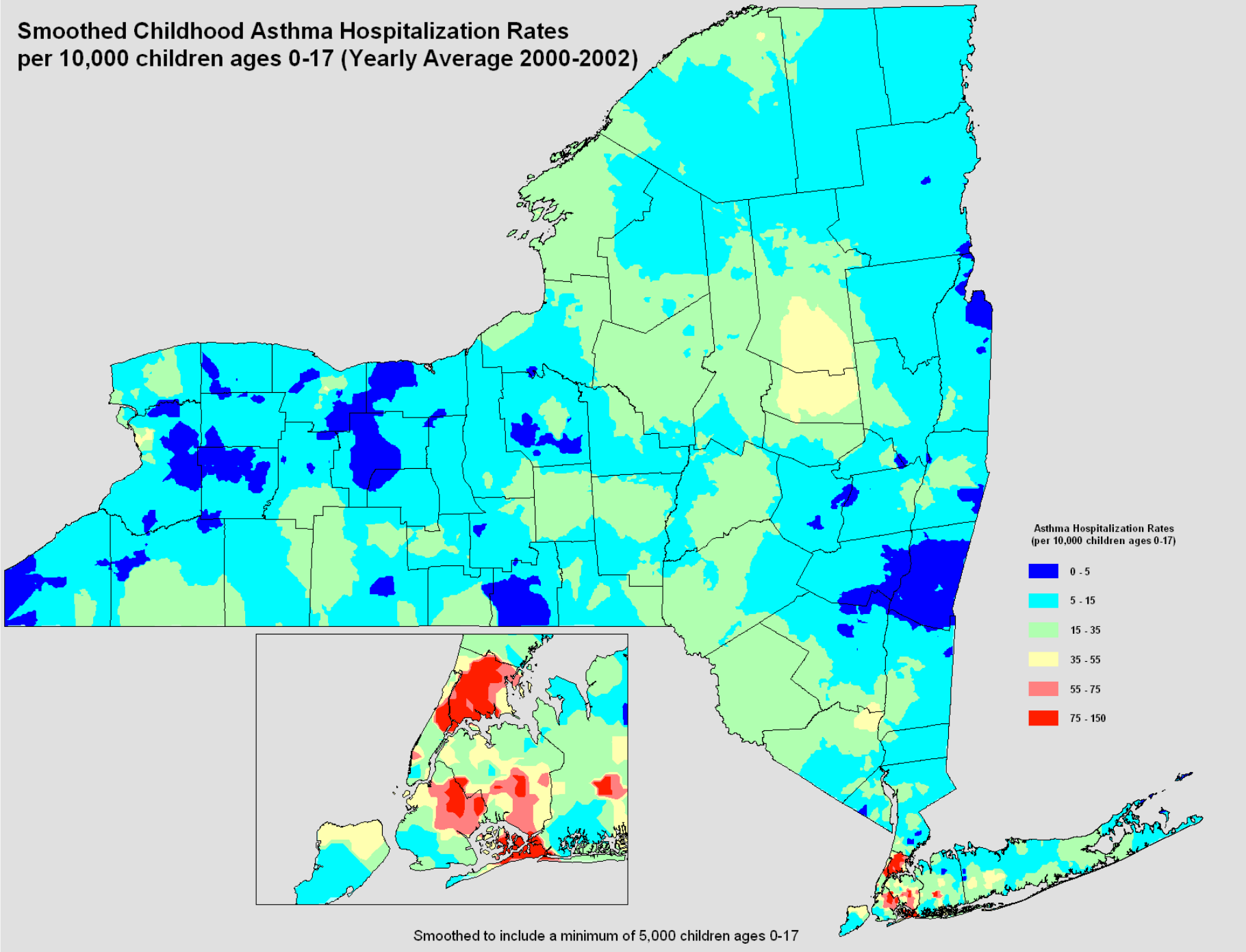
Example of EPA modeled ozone levels in New York State



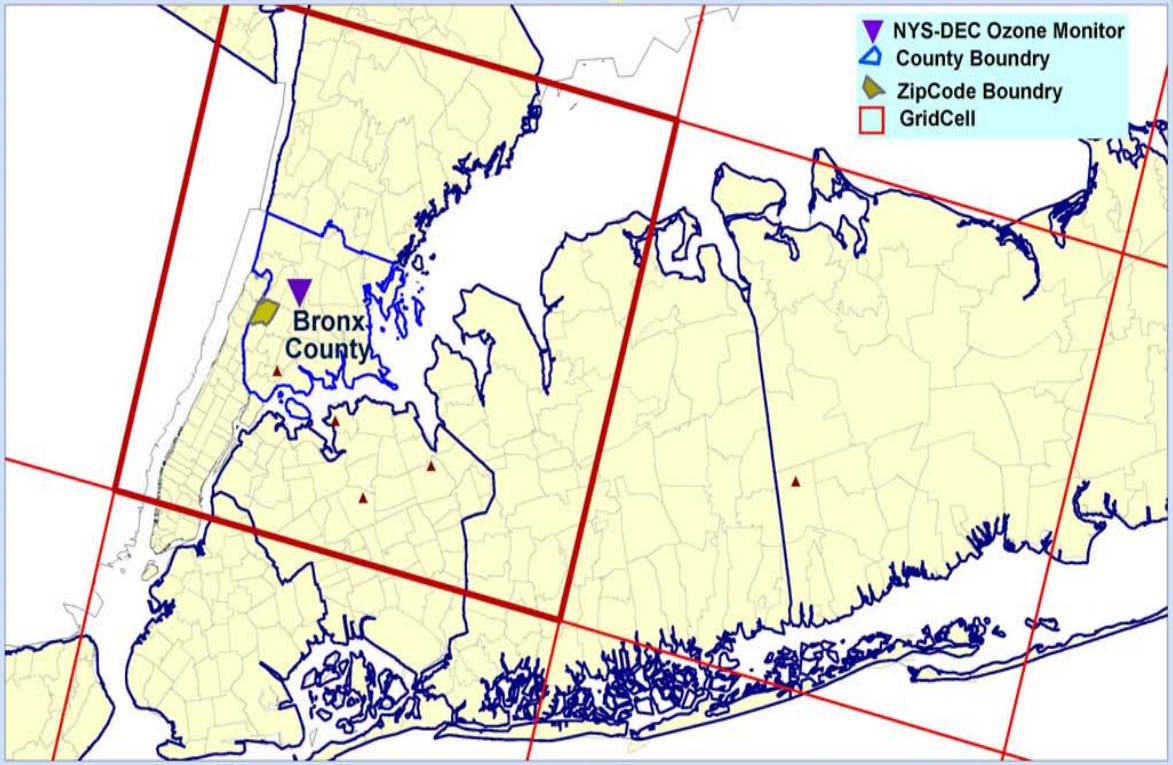
Questions about Health Outcomes



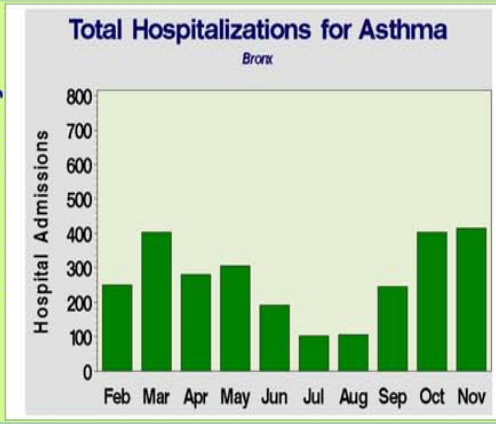

Childhood Asthma Hospitalization Rates
per 10,000 children ages 0-17 by ZIP code
(Yearly Average 2000-2002)
Asthma Hospitalizations
per 10,000 Children ages 0-17
150 to 5,000
75 to 150
55 to 75
35 to 55
15 to 35
5 to 15
0 to 5
Average for NYS = 32.4 asthma hospitalizations per 10,000 children ages 0-17 per year (NYC=54.9: Upstate/LI=16.0)


Smoothed Childhood Asthma Hospitalization Rates
per 10,000 children ages 0-17 (Yearly Average 2000-2002)
Asthma Hospitalization Rates
(per 10,000 children ages 0-17)
0 - 5
5 - 15
15 - 35
35 - 55
55 - 75
75 - 150
Smoothed to include a minimum of 5,000 children ages 0-17

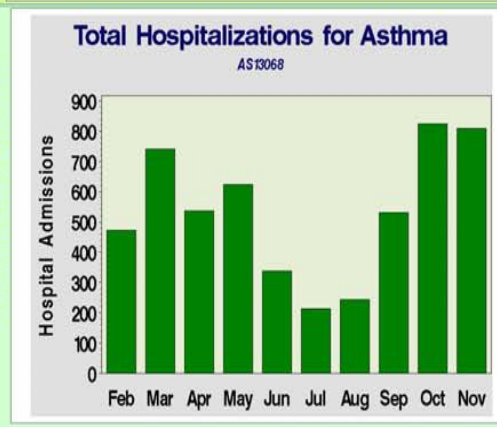
Ozone and Asthma Hospitalization: Year 2001



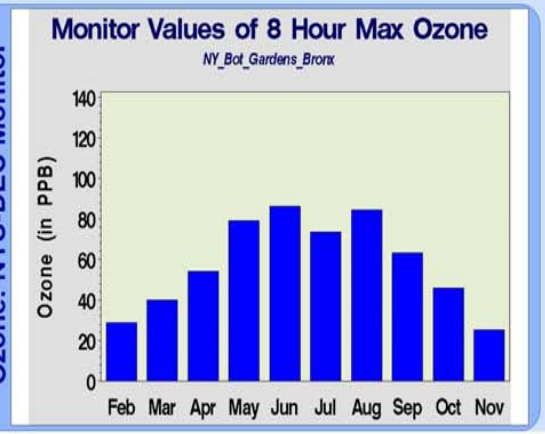
Asthma: County



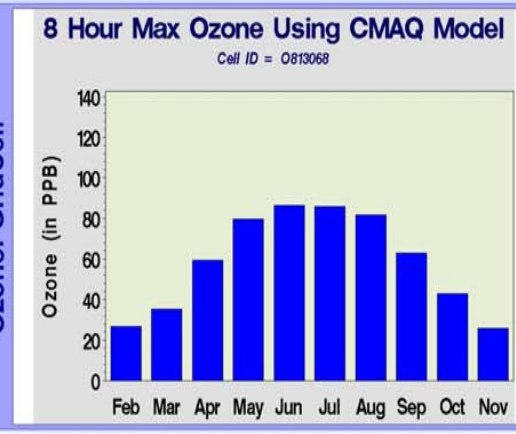
Asthma: Grid Cell



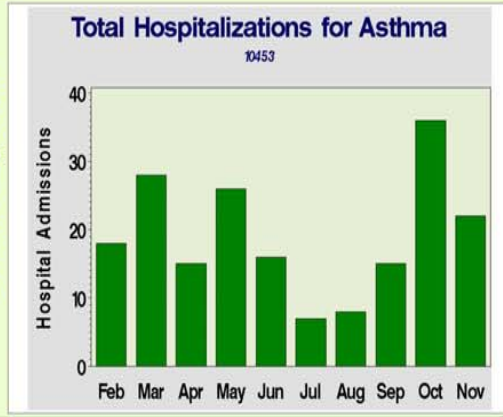
Ozone: NYS-DEC Monitor



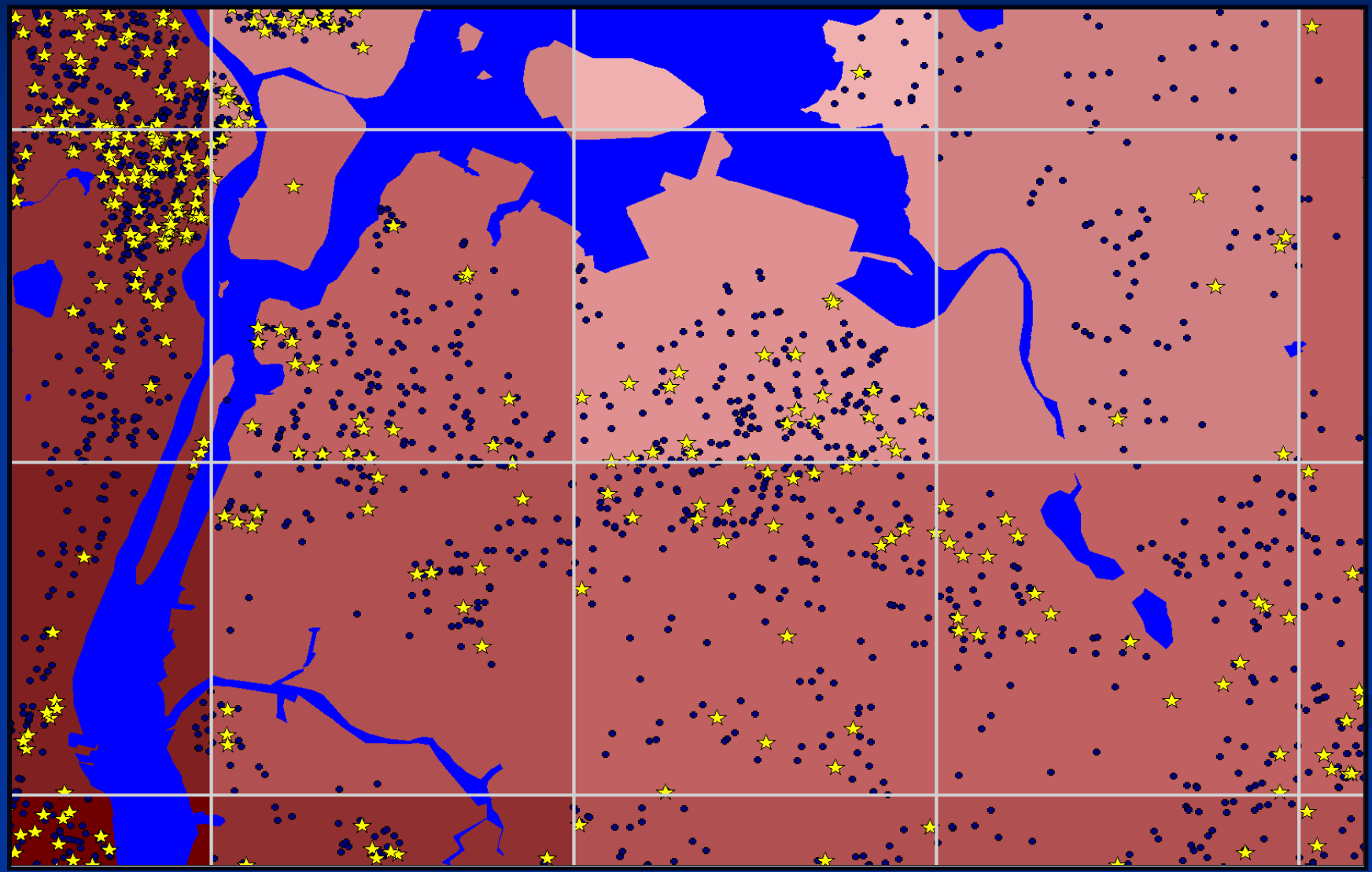
Ozone: GridCell



Asthma: ZipCode

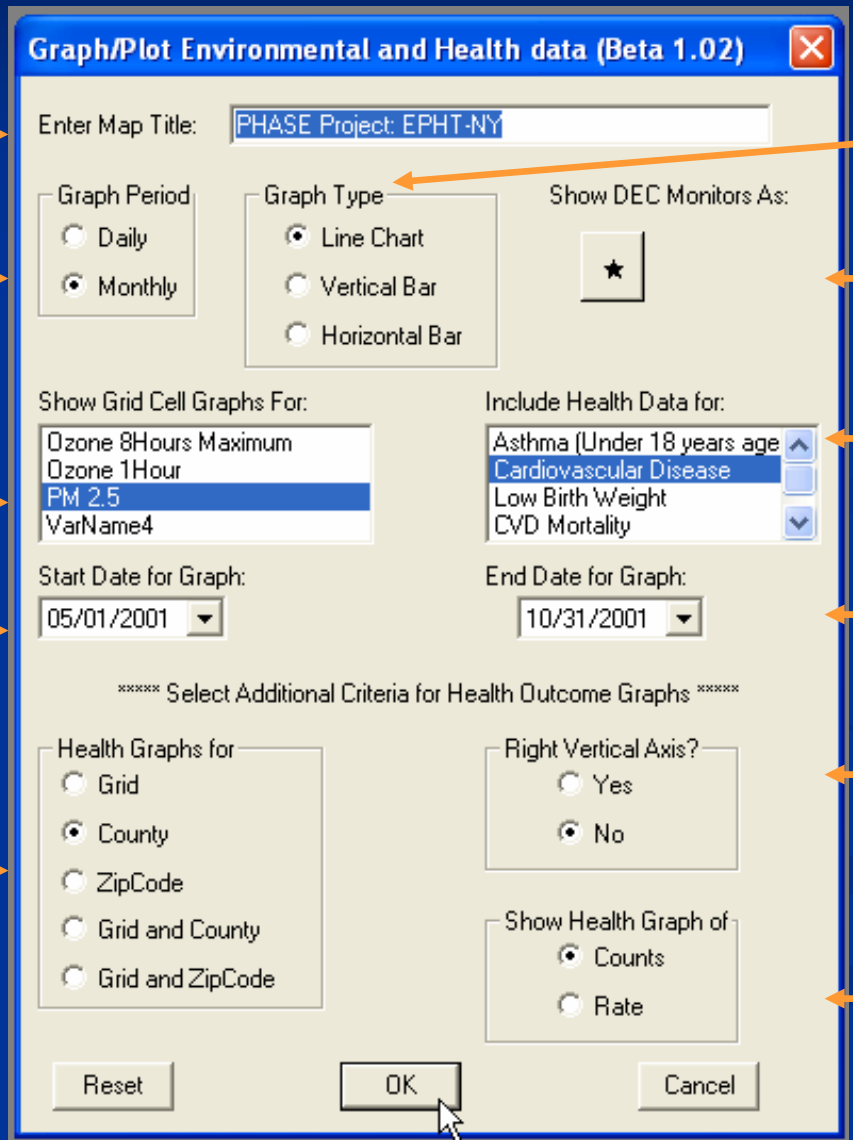


Linking Health Data to Environmental Hazard Data
August 3



∃ August 3 Cases ! Air Pollution Levels

Functions of the EPHT Surveillance System



Enter Title for Layout

Select either Daily or Monthly

Select pollutant

Select Start date

Select Geographical unit for Health Graphs

Select type of graph

Select symbol

Select health outcome

Select End Date

Select yes for both, health and air data, on one graph

Select either counts or rates

EPHT Demonstration Project: Air Quality Data with Respiratory and Cardiovascular Data

- Hospitalization Data (Asthma and Myocardial Infarction) and Mortality Data (Myocardial Infarction)
  - Geocode Residential Addresses
- Link with Air Quality Data
  - $PM_{2.5}$ and Ozone
  - Monitored, Interpolated, Modeled
  - Several Levels of Geographic Resolution
- Data Visualization and Analysis
  - Track and Describe Asthma and Myocardial Infarction Rates and Air Pollutant Levels Separately and Jointly in Time and Space
  - Test for Association Using Case-Crossover Methods

Advantages of Pilot Surveillance System

- "One Stop Shopping"
  - Easier Access to Existing Data
- Compatible with National Surveillance System
  - Ultimate CDC Goal
- Facilitate Understanding of Association Between Environmental Hazards and Exposure and Disease

Surveillance Alone Cannot Prove Causality

- Limited to Routinely Available Data
- Data Quality Issues
  - Accuracy and Completeness
- Lack of Data on Confounding Variables
  - Smoking and Occupation
- Lack of Individual Level Exposures
  - Ecologic (Community Level) Only
- Lack of Information Regarding Residential Mobility
  - Only Current Residence

Future of EPHT

- Development of National Network
- Improved Environmental Health Infrastructure
  - Increased Staffing, Networking, Contacts
  - Sharing of Ideas, Methods, Data
  - Focused State and Local Tracking Projects