

# Addressing Gaps in Evidence and Data for Environmental Public Health

Data Challenges in the Physical Sciences

ACDEB Meeting 7

April 23, 2021

Heather Strosnider, PhD, MPH

Section Chief

Environmental Public Health Tracking Section

Division of Environmental Health Science and Practice



Funded since 2002

# CDC'S ENVIRONMENTAL PUBLIC HEALTH TRACKING PROGRAM

Goal: Increase the number of **data-driven** environmental public health **actions and decisions** by providing information from a **nationwide network** of **standardized, integrated** health and environmental data

# Reducing Pesticides Near Schools in California

CALIFORNIA  
ENVIRONMENTAL  
HEALTH TRACKING  
PROGRAM

## Agricultural Pesticide Use Near Public Schools in California Executive Summary

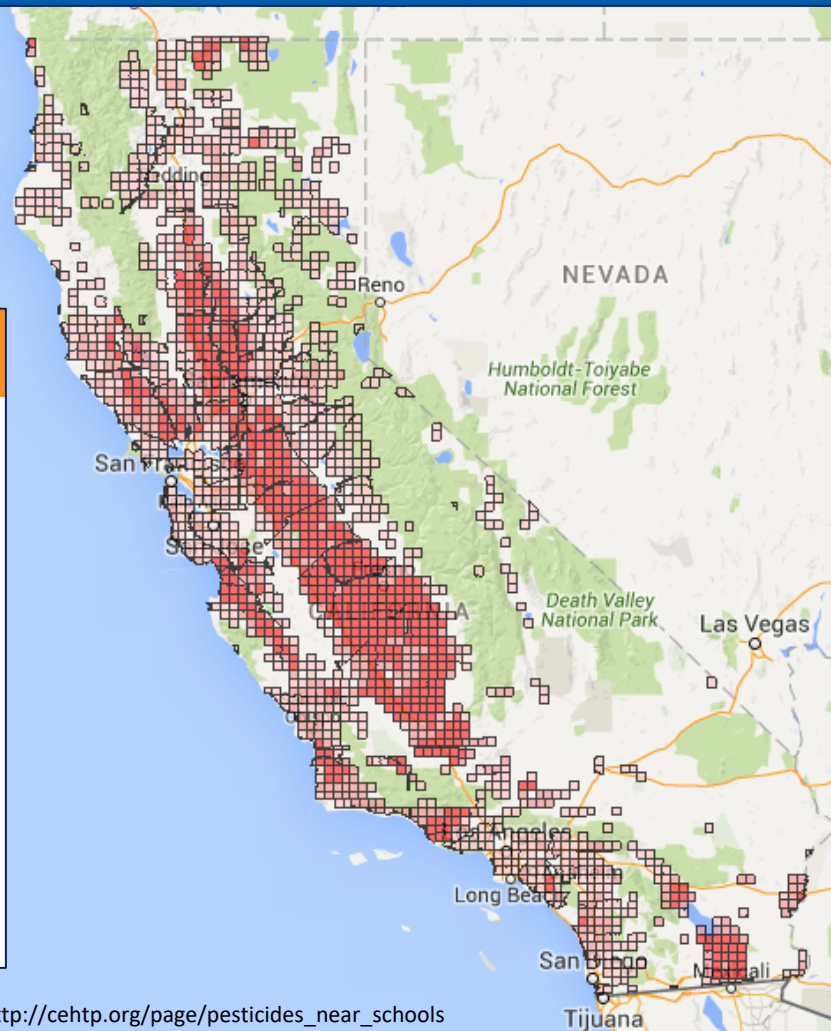
California agriculture produces nearly half of all fruits and vegetables grown in the United States. These foods are essential components of a healthful diet and help promote public health here and throughout the country. However, agricultural production frequently relies on the application of pesticides that, under some circumstances, can be hazardous to human health. Compared with adults, children are more susceptible to the effects of pesticide exposure. Because of the potential public health risks to children, we examined the use of selected agricultural pesticides near public schools in the top 15 counties by agricultural pesticide use in California for 2010. Our goals were to improve the methodology for the ongoing surveillance of agricultural pesticides to understand pesticide use patterns and provide information that can be used to assess and inform efforts to minimize potential pesticide exposures among schoolchildren.

In 1990, California established the Pesticide Use Reporting (PUR) program, a world-class system administered by the California Department of Pesticide Regulation (CDPR) to collect and disseminate data on pesticide use. For this study, we utilized the most accurate data available from PUR and other sources to estimate pesticide applications within ¼ mile of school property boundaries. The pesticides included in this study were selected for their public health relevance and categorized based on their known health effects or regulatory status. The six categories of pesticides considered are carcinogens, reproductive and developmental toxicants, cholinesterase inhibitors, toxic air contaminants, fumigants, and priority pesticides for assessment and monitoring. These chemicals, many of which are of regulatory interest in California, are considered in this report to be **pesticides of public health concern**.

For this study, we assessed 2,511 public schools, attended by over 1.4 million students, in the 15 counties with the highest total reported agricultural pesticide use in 2010. We linked geographic school data to over 2.3 million pesticide use records. We found:

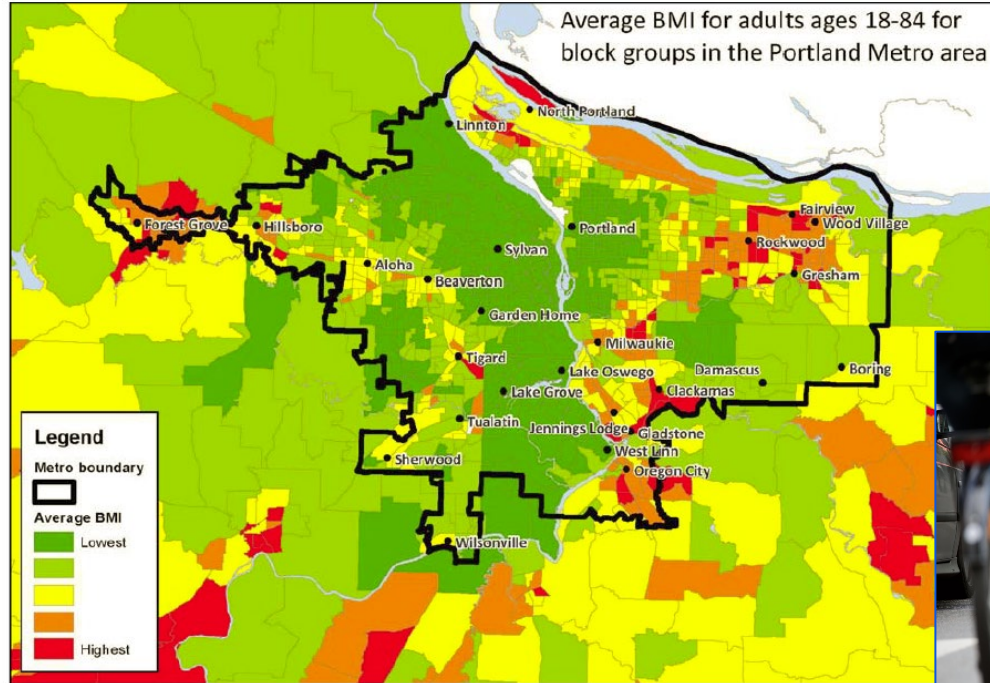
- **Most schools did not have any pesticides of public health concern applied nearby.** In 2010, the majority of schools in this study (64% or 1,612 schools) did not have any pesticides of public health concern applied within ¼ mile. For the remaining 36% of schools, pesticide use within ¼ mile ranged from 0.01–28,979 lb.
- **A small percentage of schools had many pounds of pesticides of public health concern applied nearby.**
  - The top 5% of schools with any pesticide use nearby (45 schools attended by over 35,000 students) had amounts of pesticides applied within ¼ mile ranging from 2,635–28,979 lb.
  - The top 25% of schools with any use nearby (226 schools attended by over 118,000 students) had at least 319 lb of pesticides applied within ¼ mile.
- **Pesticide use near schools varied among counties.**
  - Fresno County had the highest number of schools (131) with any pesticides applied nearby, whereas Tulare County had the highest percentage of its schools (63.4%) with any pesticides applied nearby.
  - Ventura County had the highest number of schools (12) and the highest number of students (13,045) in the top 5% of schools. Monterey County had the highest percentage of its schools (8%) and highest percentage of its students (13%) in the top 5% of schools.

[www.CEHTP.org/p/pesticides\\_and\\_schools](http://www.CEHTP.org/p/pesticides_and_schools)



[http://cehtp.org/page/pesticides\\_near\\_schools](http://cehtp.org/page/pesticides_near_schools)

# Evaluating Health Impact of Transportation Strategies in OR



Source: Oregon Health Authority, Environmental Public Health Tracking report: DMV records are valuable for obesity surveillance in Oregon, September 2012





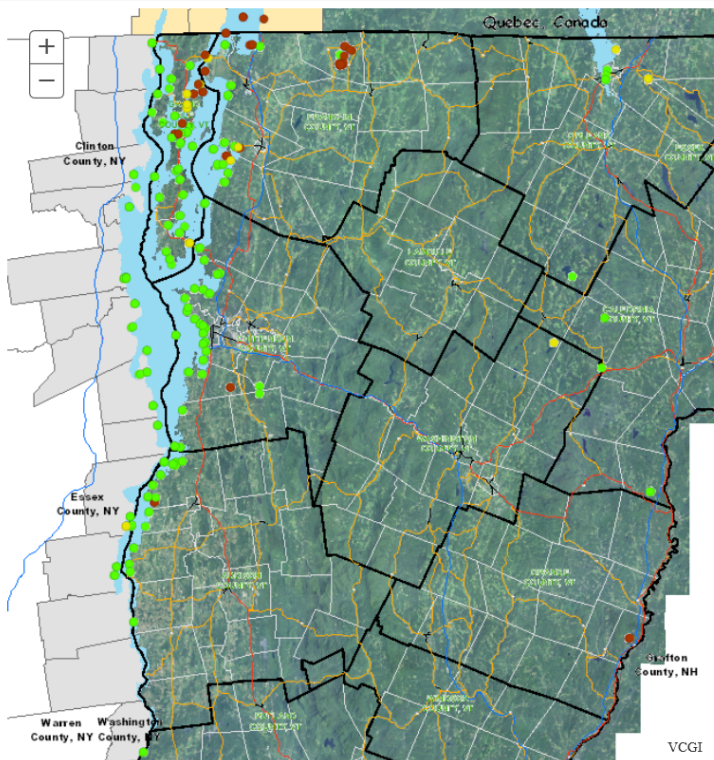
# Tracking Blue Green Algae in Vermont

## Cyanobacteria (Blue Green Algae) Tracker

Conditions change quickly. Keep people and pets away from anything you suspect might be a cyanobacteria bloom.

Select Monitoring Town

Select Lake/Region



### Conditions shown on the map are based on the most recent report available.

This map shows the most recent conditions that have been reported from monitored locations. Widespread monitoring typically ends in September. For current conditions at a swimming area, contact the town, [Vermont State Park](#), or private association responsible for maintaining that area.

### Learn what blooms look like so you can avoid them.

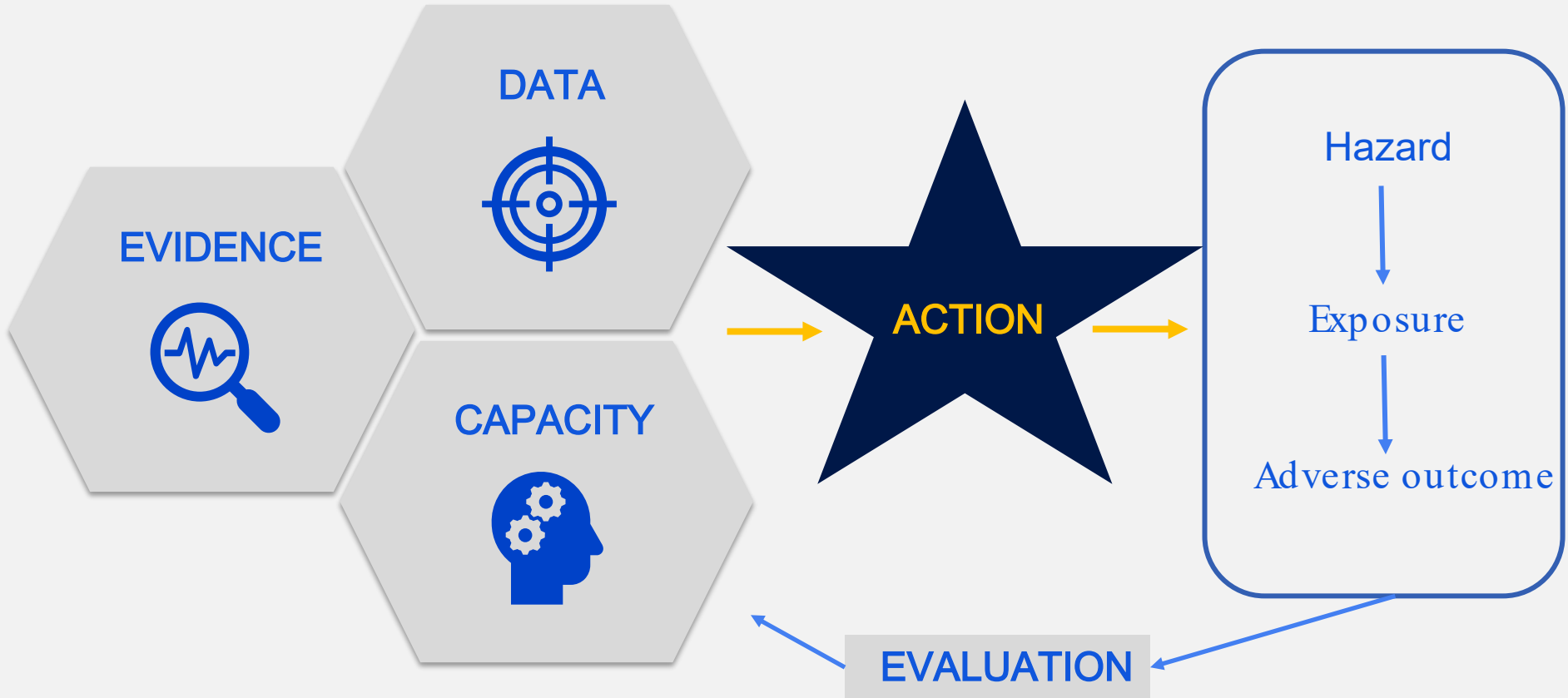
Watch a video of what cyanobacteria blooms look like [here](#).

### What are Cyanobacteria?

Cyanobacteria, also known as blue-green algae, are a natural component of marine and fresh water ecosystems. Under certain conditions, cyanobacteria multiply quickly, creating blooms. Some blooms produce toxins which can make people and pets sick. [Learn more about cyanobacteria \(blue-green algae\).](#)

| Date      | Site | Site Name                           | Town             | Status                         |
|-----------|------|-------------------------------------|------------------|--------------------------------|
| 9/20/2018 | 431  | East Shore of Ransoms Bay - Swanton | Swanton          | <a href="#">High Alert</a>     |
| 9/20/2018 | 43   | Oakledge Park South Cove            | Burlington       | <a href="#">Generally Safe</a> |
| 9/20/2018 | 44   | Oakledge Park Rocky Shoreline       | Burlington       | <a href="#">Generally Safe</a> |
| 9/20/2018 | 42   | Oakledge Park Blanchard Beach       | Burlington       | <a href="#">Generally Safe</a> |
| 9/20/2018 | 533  | Strong House Lane                   | North Hero       | <a href="#">High Alert</a>     |
| 9/20/2018 | 169  | Lake Iroquois Southwest             | Other            | <a href="#">Generally Safe</a> |
| 9/20/2018 | 51   | Phillipsburg Pelagic                | Phillipsburg, QC | <a href="#">High Alert</a>     |
| 9/20/2018 | 45   | Oliver Bay                          | Plattsburgh, NY  | <a href="#">Generally Safe</a> |
| 9/20/2018 | 517  | Pike River Mouth                    | Saint Armand, QC | <a href="#">High Alert</a>     |
| 9/20/2018 | 58   | Phillipsburg, QC                    | Phillipsburg, QC | <a href="#">High Alert</a>     |
| 9/20/2018 | 189  | Allen Point                         | South Hero       | <a href="#">Generally Safe</a> |
| 9/19/2018 | 389  | Alburgh                             | Alburgh          | <a href="#">Generally Safe</a> |
| 9/19/2018 | 377  | Bayside Beach                       | Colchester       | <a href="#">Generally Safe</a> |
| 9/19/2018 | 120  | Malletts Bay Boat Launch            | Colchester       | <a href="#">Generally Safe</a> |
| 9/19/2018 | 54   | Leddy Park                          | Burlington       | <a href="#">Generally Safe</a> |





In order to have data-driven actions, data must be:



**TIMELY**



**ACCURATE**



**LOCAL**



**ACCESSIBLE**

# Tracking Program Core Strategies



Improve data utility



Enhance data use



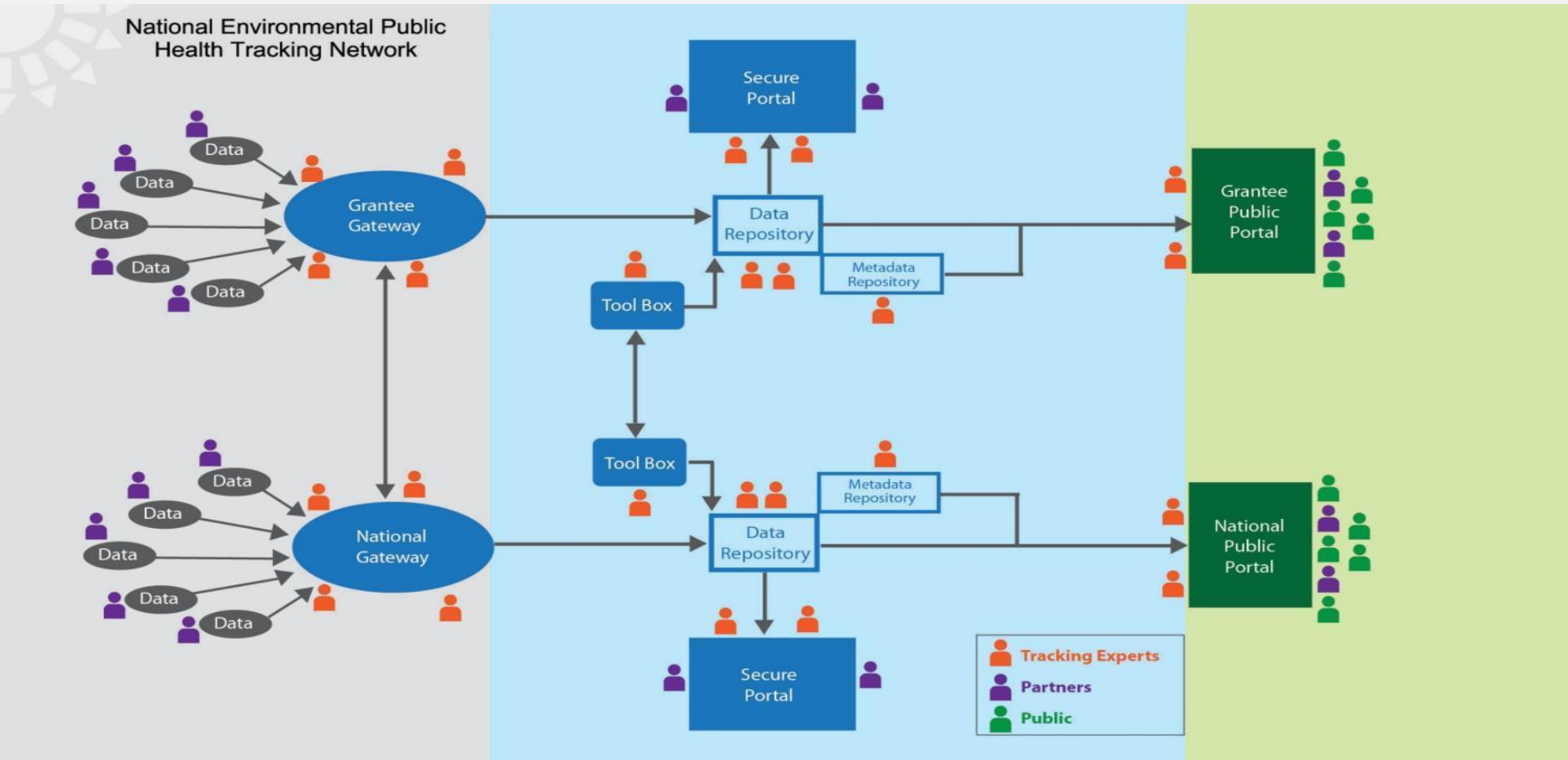
Expand data access



Increase network awareness



# Infrastructure + Data + People





ENVIRONMENTAL PUBLIC HEALTH

**TRACKING**

# CONNECTS ENVIRONMENT & HEALTH INFORMATION

*Check out CDC's data explorer and state and local tracking programs for more information.*

## Environmental

- Radon
- Drought
- Sunlight & UV
- Wildfire Smoke
- Air Quality
- Extreme Heat
- Drinking Water
- Flood Vulnerability
- Community Design

- Pesticide Exposures
- Toxic Substance Releases
- Other Environmental Chemicals

## Exposures

## Health Effects

- Asthma
- Cancer
- Heart Disease
- Heat Stress Illness
- Childhood Lead Poisoning
- Developmental Disabilities
- Carbon Monoxide Poisoning
- Reproductive and Birth Outcomes

## Population Characteristics

- Lifestyle Risk Factors
- Socioeconomics
- Demographics
- Vulnerabilities

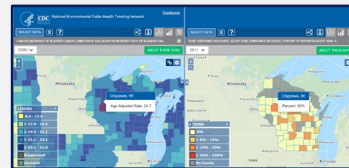




# Accessible Data via the National Tracking Network

The screenshot shows the CDC National Environmental Public Health Tracking Network homepage. At the top, the CDC logo and name are displayed. A search bar and a 'CDC A-Z INDEX' dropdown are on the right. The main heading is 'National Environmental Public Health Tracking Network'. Below it, social media icons for Facebook, Twitter, and YouTube are shown. A section titled 'Better information for better health' explains the network's purpose. A list of features includes: 'Use the Data Explorer to view interactive maps, tables, and charts', 'View Info by Location for county level data snapshots', and 'Visit state & local tracking websites'. A central image shows a person looking at a large screen displaying 'Tracking Environmental Health Data'. Below this, a quote states: 'The environment where we live, work, and play can affect our health. Use the Tracking Network and learn how your environment impacts you. [bit.ly/DataYourWay](http://bit.ly/DataYourWay)'. At the bottom, three buttons are labeled 'ACCESS THE NEW DATA EXPLORER', 'INFO BY LOCATION', and 'STATE & LOCAL TRACKING PROGRAMS'. Below these are three tabs: 'Environments', 'Health Effects', and 'Population Health'.

[www.cdc.gov/ephtracking](http://www.cdc.gov/ephtracking)



Data Explorer

The screenshot shows the Info by Location interface. It features a map of the United States with a bar chart overlay. The text 'INFO BY LOCATION' is at the top, followed by 'Data for you!' and 'View data by county or zip code'. A 'GO' button is at the bottom right. The bar chart shows data for a specific location, with a legend indicating 'All-cause mortality' and 'Cancer'.

Info by Location

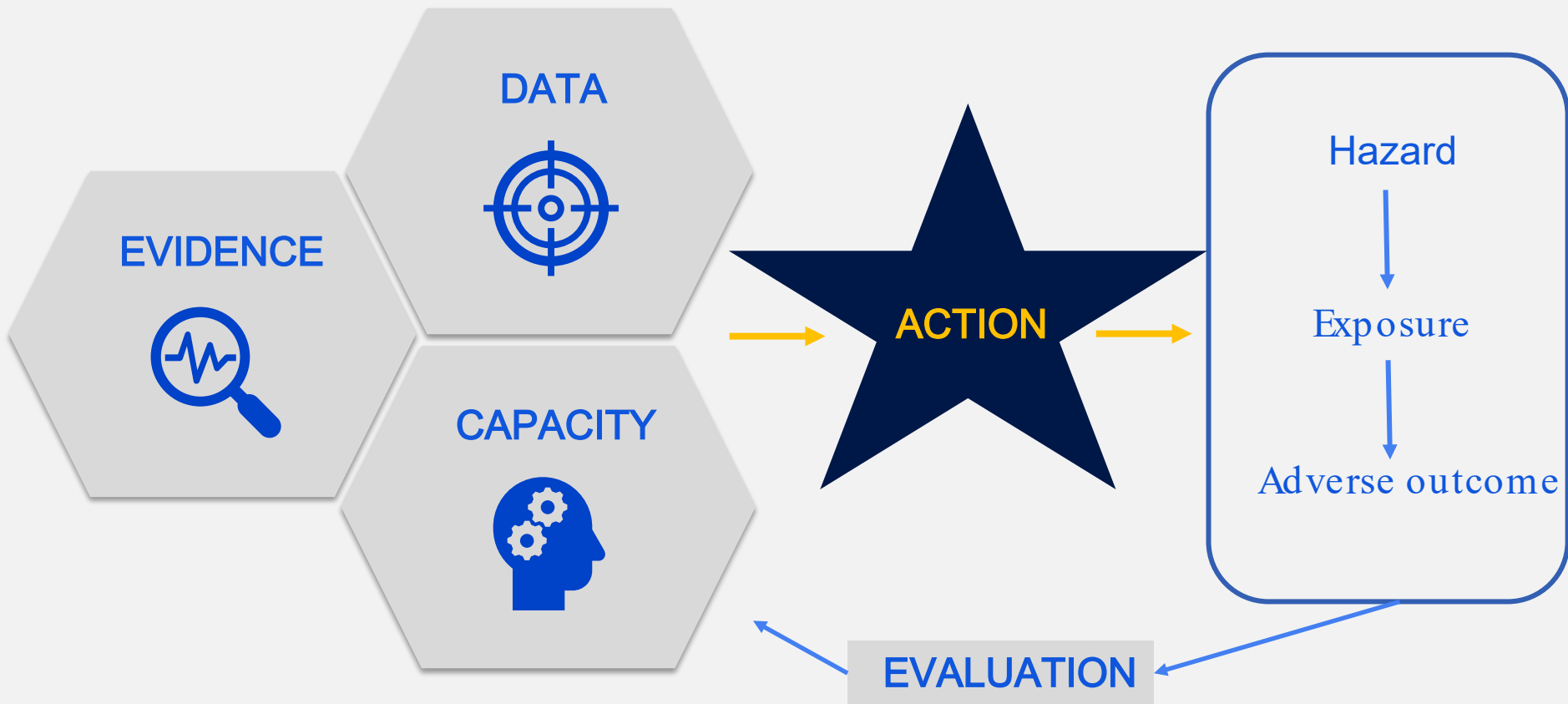
The screenshot shows the Downloadable Datasets interface. It features a list of datasets on the left and a 'Downloadable Datasets' section on the right. The list includes 'All-cause mortality', 'Cancer', 'Chronic diseases', 'Infectious diseases', 'Injuries', 'Mental health', 'Neurological disorders', 'Respiratory diseases', 'Skin diseases', 'Skeletal diseases', 'Sensory system disorders', and 'Vital events'. The 'Downloadable Datasets' section provides information about the datasets, including their format, size, and download instructions.

Downloadable Datasets

The screenshot shows the Application Program Interface (API) interface. It features a map of the United States with a bar chart overlay. The text 'ARE YOU A DEVELOPER?' is at the top, followed by 'ACCESS TRACKING DATA USING OUR NEW API'. A 'GO' button is at the bottom right. The bar chart shows data for a specific location, with a legend indicating 'All-cause mortality' and 'Cancer'.

Application Program Interface

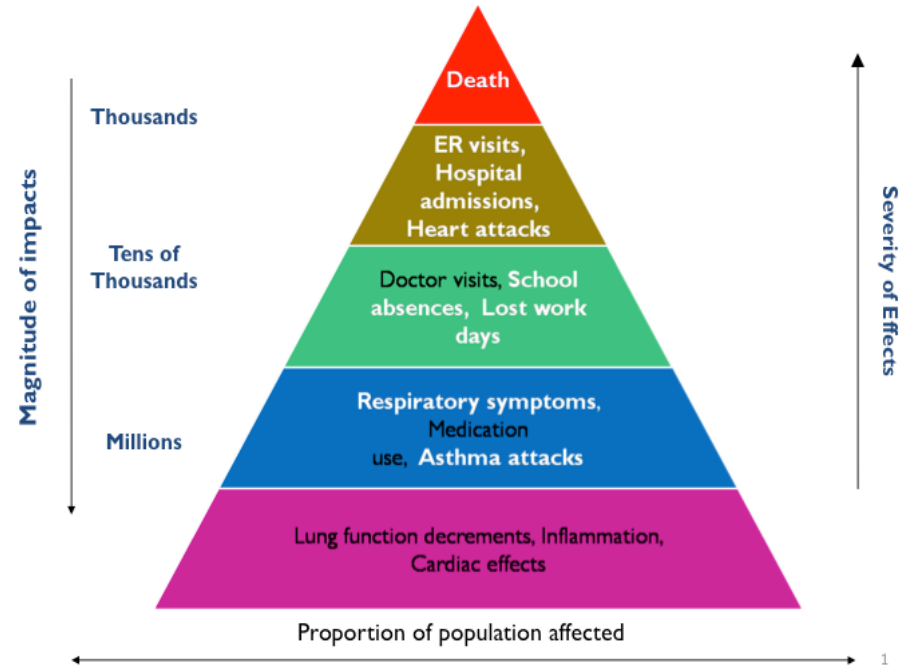
# Mitigating the Impact of Air Pollution



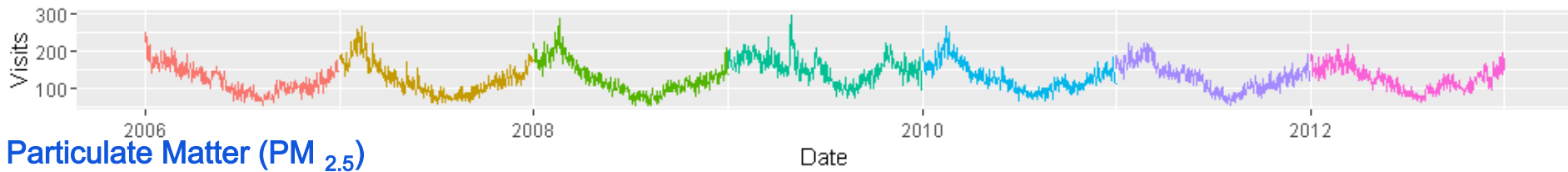
# Addressing Gaps in Evidence Used for Air Standards

- **Currently standards rely on studies that are**
  - Multi-city with populations over 65
  - Medicare data
  - Single city studies with all ages, or
  - International
- **Estimates could be more robust by including studies that have**
  - Multiple U.S. cities and all ages
  - Sensitive populations

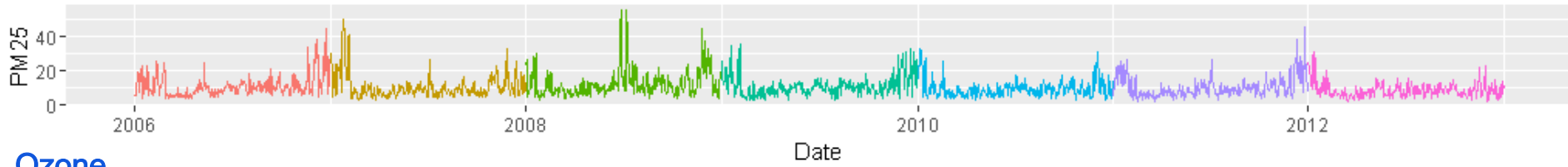
A “Pyramid of Effects” from Air Pollution



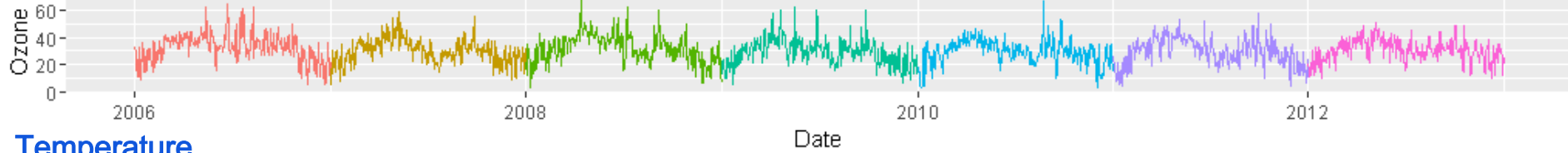
# Emergency Department Visits



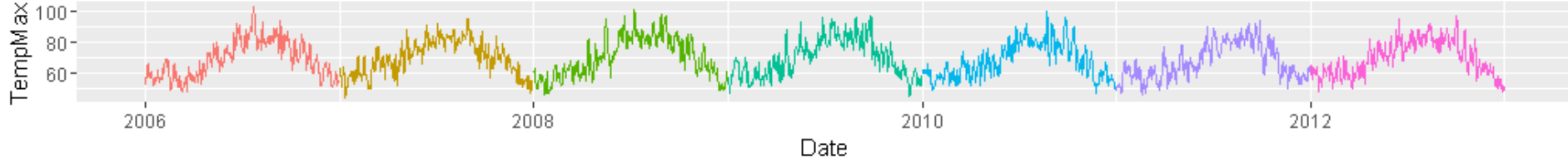
# Particulate Matter (PM<sub>2.5</sub>)



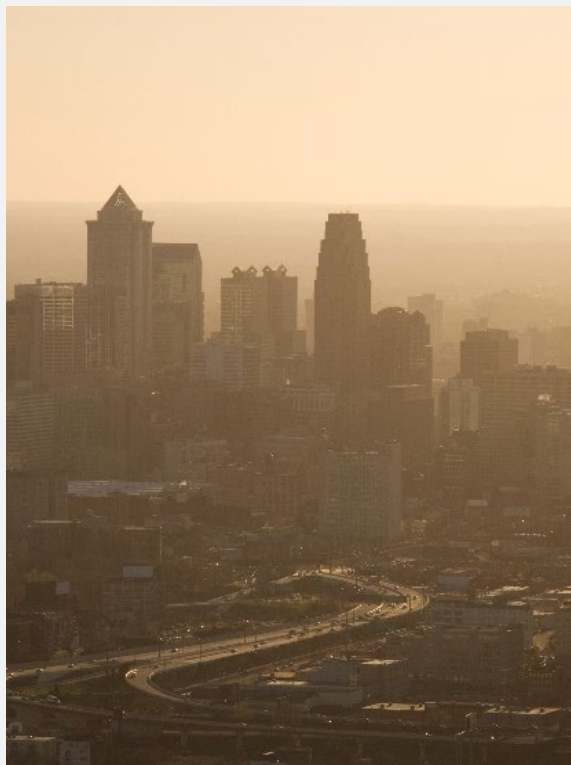
# Ozone



# Temperature



# Addressing Gaps in Evidence Used for Air Standards



- Investigated short-term associations between
  - Pollutants: Ozone, PM<sub>2.5</sub>
  - Respiratory ED visits: All, Acute respiratory infections, Asthma, COPD, Pneumonia
  - Age groups: All, 0-<19, 19-<65, 65+
- Found significant positive associations for all age groups between all respiratory ED visits and both pollutants
  - Except PM<sub>2.5</sub> among 65+
  - Highest magnitude association among 19-<65
- PM<sub>2.5</sub> was associated with respiratory emergency department visits among 0-<19 and 19-<65 but not 65+
- The associations also varied by age group for specific respiratory outcomes



**HStrosnider@cdc.gov**

**<https://ephtracking.cdc.gov/>**



For more information, contact NCEH  
1-800-CDC-INFO (232-4636)  
TTY: 1-888-232-6348      [www.cdc.gov](http://www.cdc.gov)

The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.

