NATIONAL
Environmental Public Health Tracking Program

Environmental Public Health Tracking In New York State

Neil Muscatiello

February 12, 2015

- EPHT Background & History
- NYS EPHT
- Public Health Actions
- Partnerships and Collaborations
- Future Directions

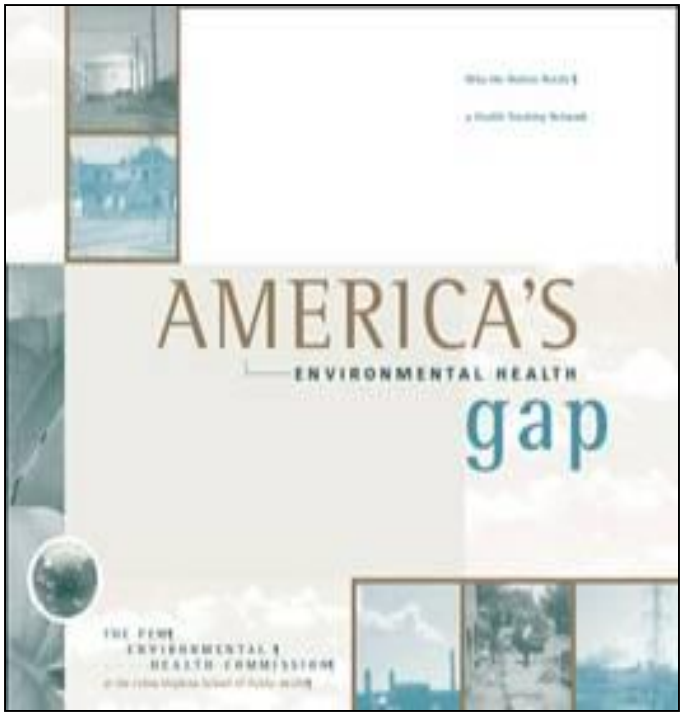
EPHT Background and History

What is EPHT?

- The ongoing collection, integration, analysis, and interpretation of data about environmental hazards, exposure to environmental hazards, and human health effects potentially related to exposure to environmental hazards.
- A tracking network must effectively disseminate information learned from these data to guide public health action.

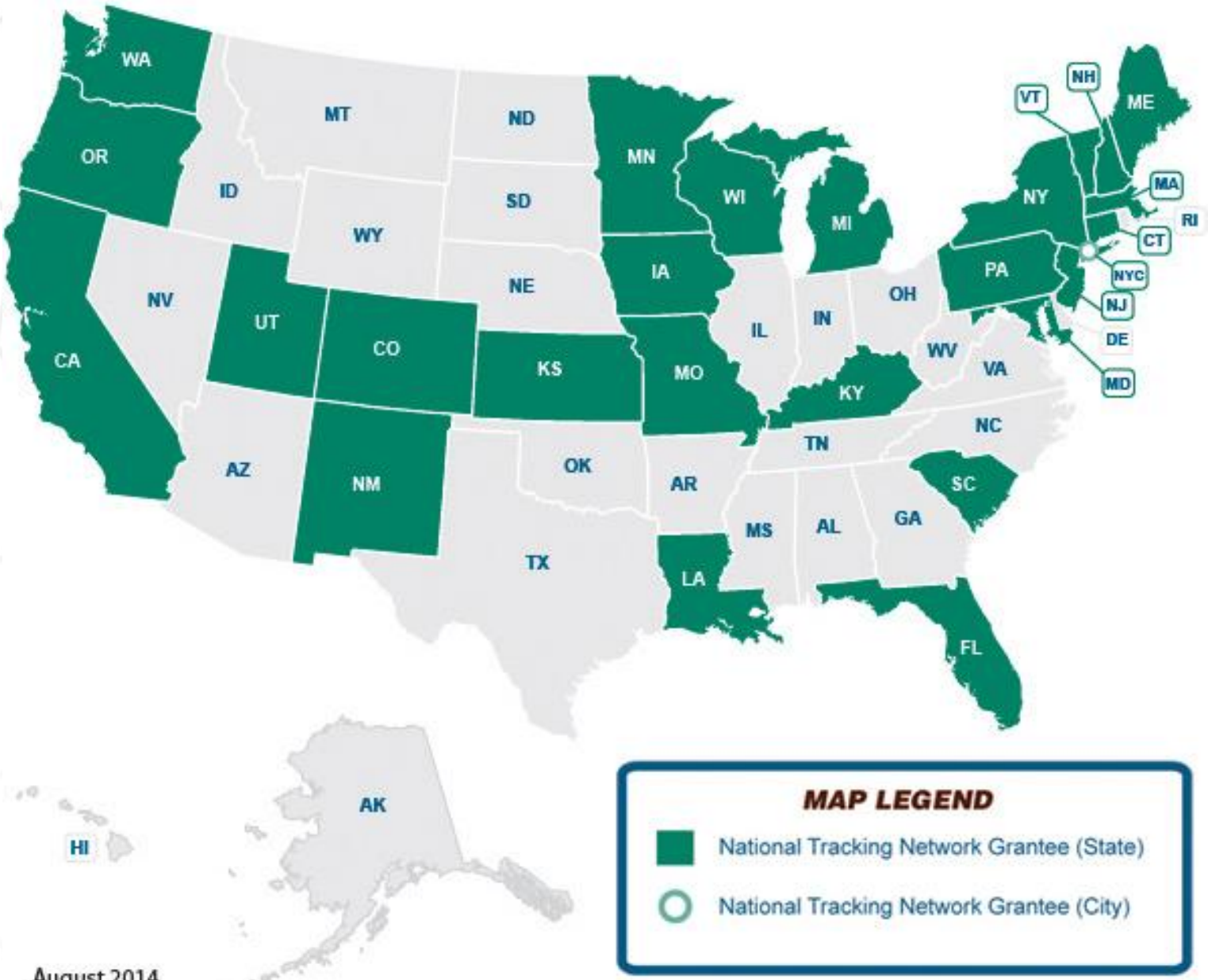
History

- In 2000, the Pew Environmental Health Commission detailed an "environmental health gap," a lack of basic information needed to document links between environmental hazards and chronic disease.



Current EPHT grantees

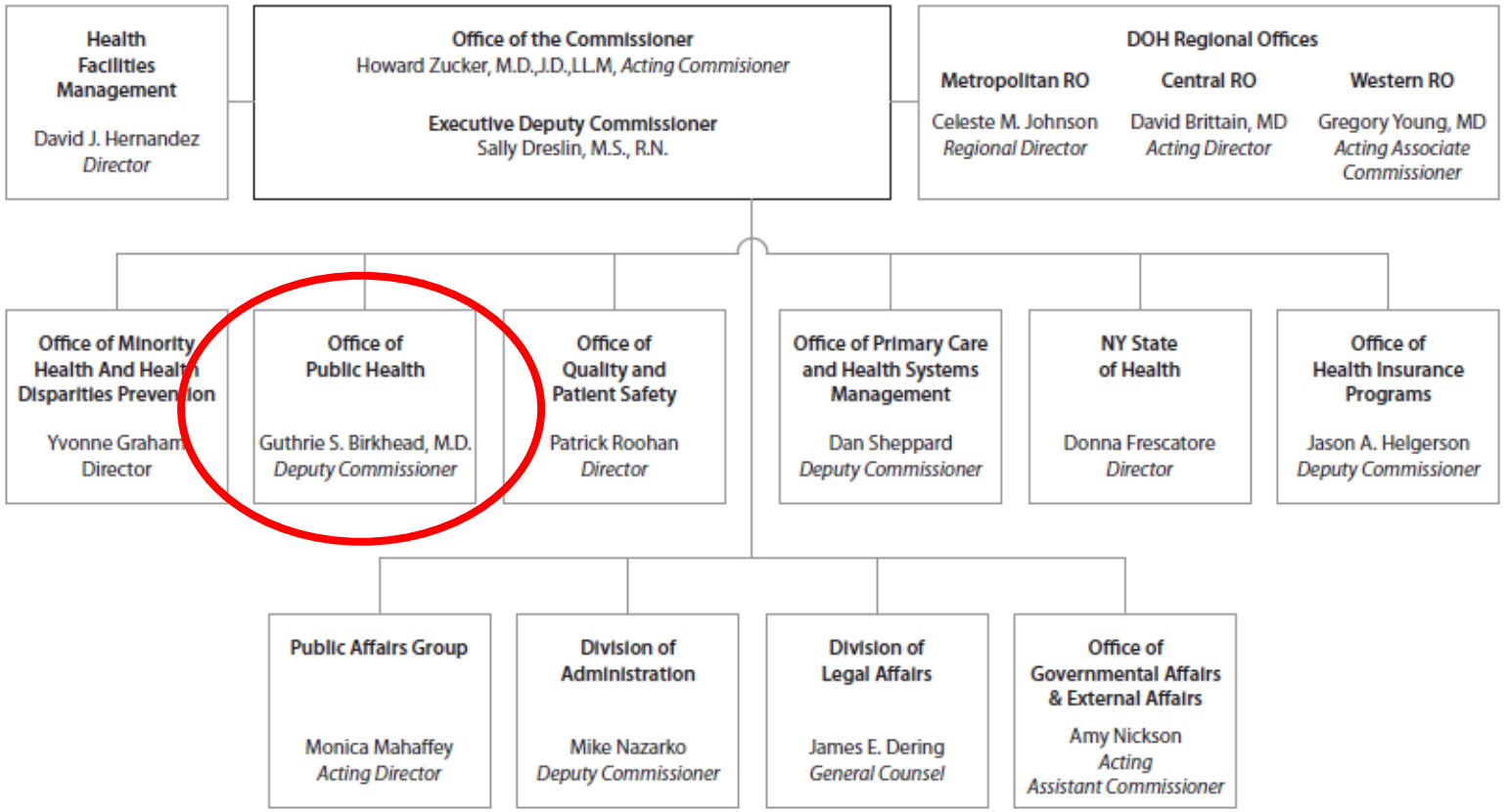
States



NYS EPHT

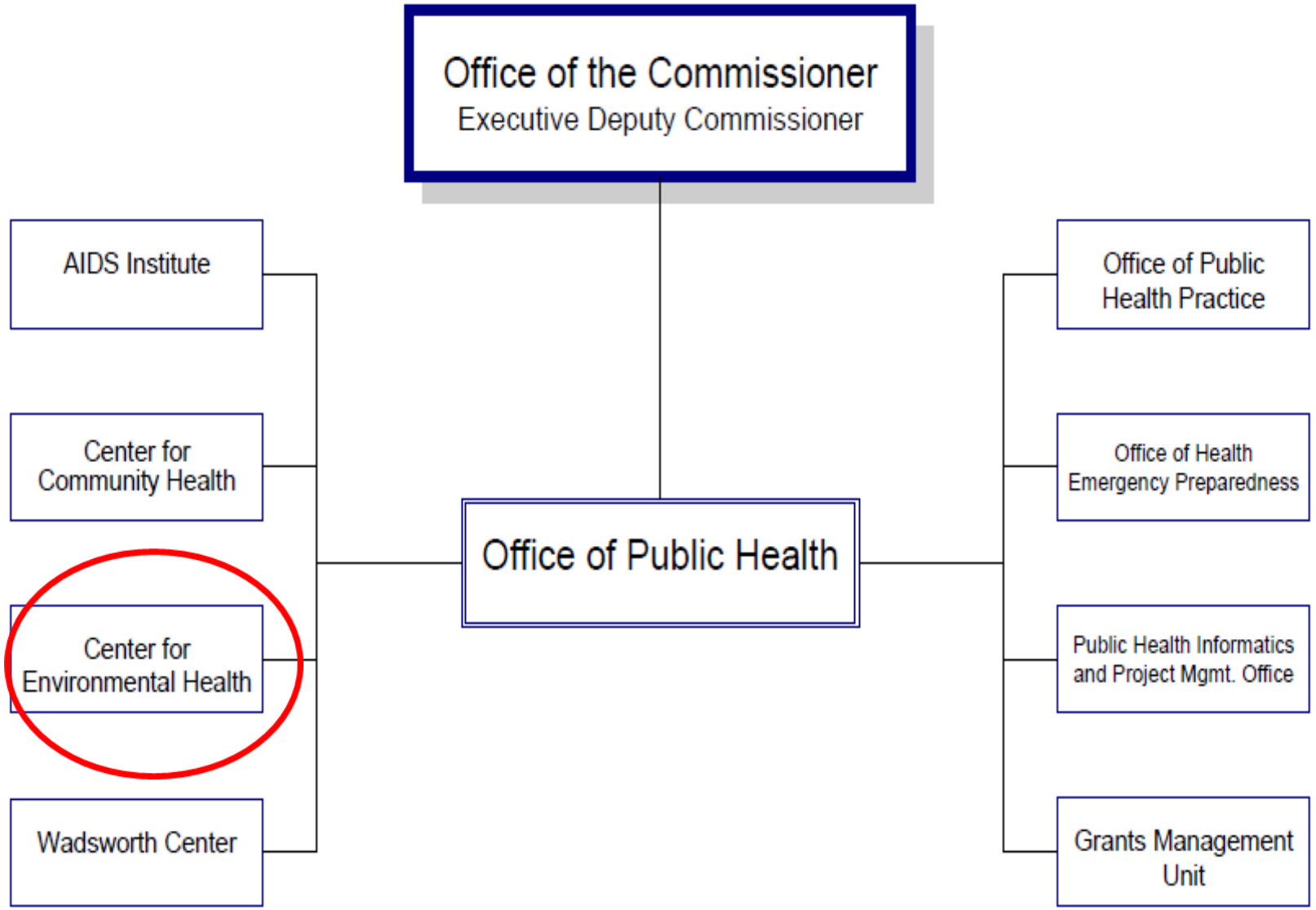
NEW YORK STATE OF OPPORTUNITY. Department of Health

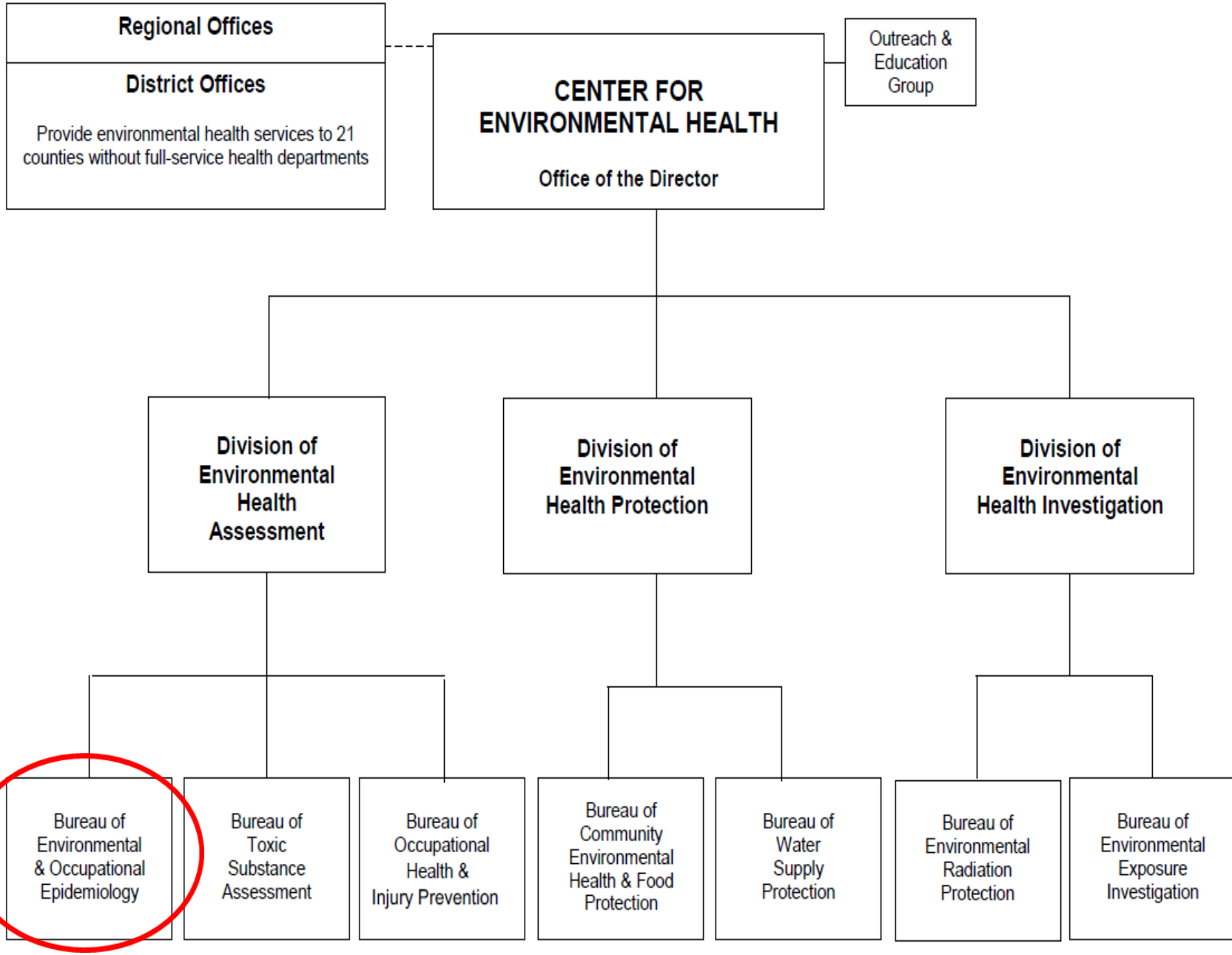
December 2014



NATIONAL Environmental Public Health Tracking Program

Organization of Public Health Programs




Regional Offices
District Offices
Provide environmental health services to 21 counties without full-service health departments
CENTER FOR ENVIRONMENTAL HEALTH
Office of the Director
Outreach & Education Group
Division of Environmental Health Assessment
Division of Environmental Health Protection
Division of Environmental Health Investigation
Bureau of Environmental & Occupational Epidemiology
Bureau of Toxic Substance Assessment
Bureau of Occupational Health & Injury Prevention
Bureau of Community Environmental Health & Food Protection
Bureau of Water Supply Protection
Bureau of Environmental Radiation Protection
Bureau of Environmental Exposure Investigation

EPHT in NYS

- Original funding in 2002 as capacity building/demonstration project
- Continuing funding in 2006 with primary objective to build/implement NYS EPHTN and provide data to assist in building national network
- Continuing funding in 2011 & 2014 to maintain & enhance sustainability of the NYS EPHTN

EPHT in NYS

- Funding provides staff and resources
- Maintaining EPHT portals and providing NCDMs to CDC
  - 3-tiered system
- Enhancing surveillance capacity
  - Improving reporting
  - Analysis tools
  - Data linkage and visualization
- Collaborating with partners
  - Academic partners
  - Data stewards
  - Other grantees, federal/state agencies, etc.

NYS EPHT 3-tiered system

Data and Tools

	Features	Access	Purpose
Tier 1	• Individual level data • Statistical tools • Mapping tools	Researchers and project staff in CEH	Research and Surveillance
Tier 2	• Finer geographic resolution at sub-county level • Data query tools • Query based data displays including map and charts	Role based access to public health professionals Access determined by program areas/data owners	Surveillance
Tier 3	• County level data and display • Simple data queries, maps, charts, and tables • Public health message	Open access	Outreach

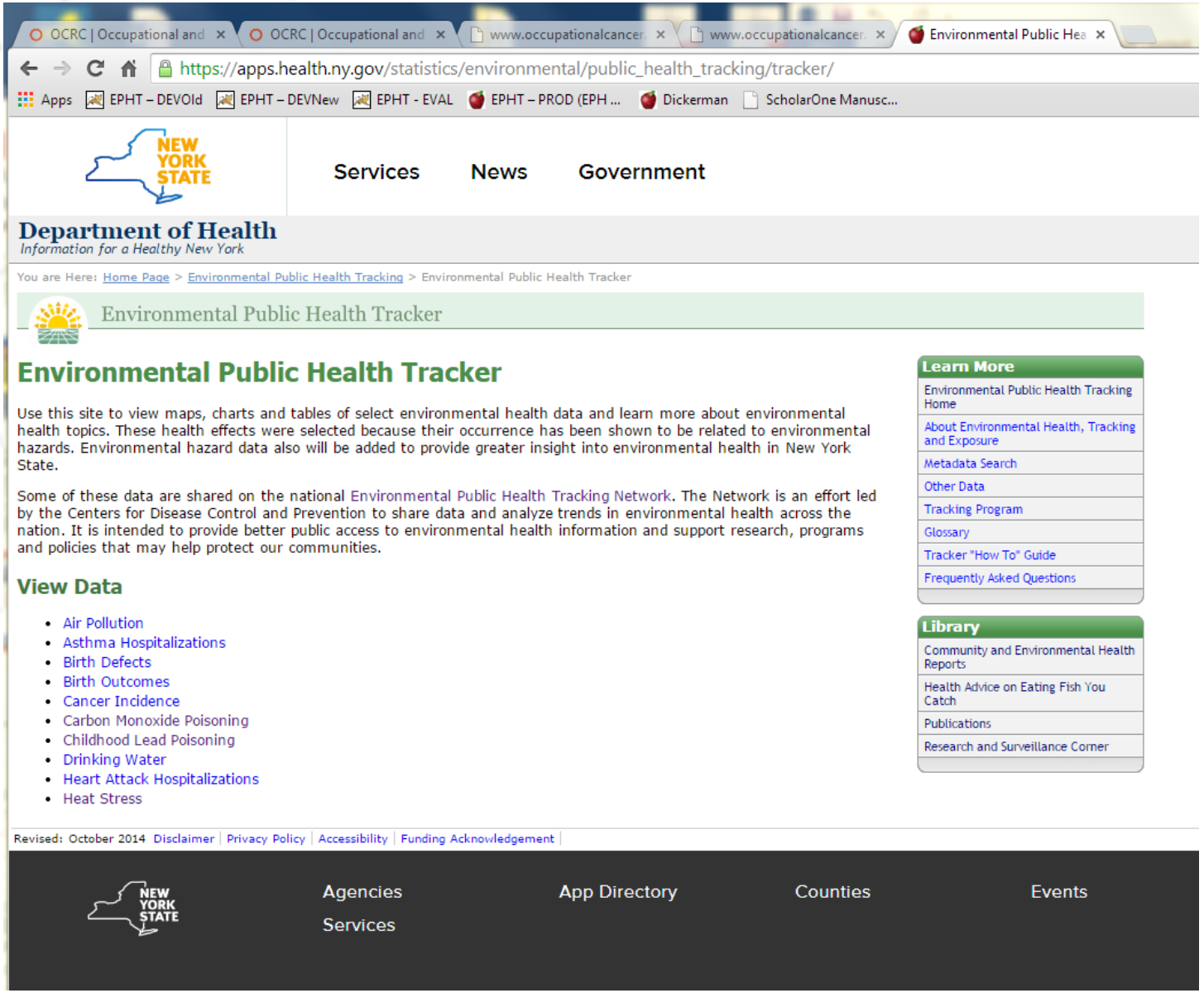
Background Information and Outreach

NATIONAL Environmental Public Health Tracking Program

Key Datasets

- Health Outcome: Vital Records, Hospital Discharge/ED Data, Disease Registries
  - Other
    - Medicaid?
    - Newborn Screening?
    - School Health/Early Intervention Programs?
- Exposure: Childhood blood lead
  - Other
    - Biomonitoring?
    - Heavy metals registry?
- Hazard: Ambient air pollution, drinking water quality (community water systems), radon, hazardous releases

NYS EPHT Portal



Available at: https://apps.health.ny.gov/statistics/environmental/public_health_tracking/tracker/

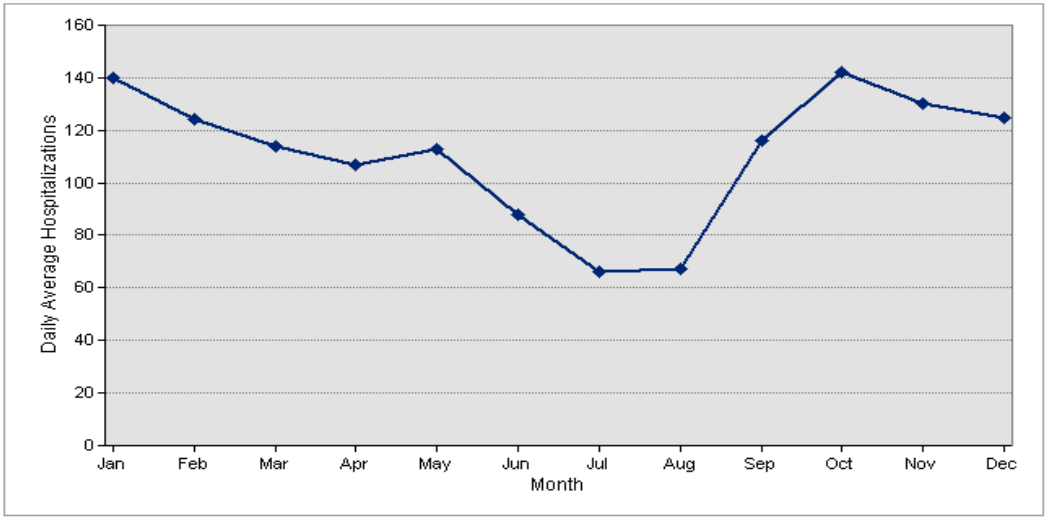
Asthma Hospitalizations

Asthma hospitalization data identify a small percentage of people with asthma, those with the condition serious enough to require a hospital stay. Hospitalization data can be used to help identify people most in need of asthma prevention and care. Use this site to view the number and rate of asthma hospitalizations.

View by: County | Age | Age and Sex | Month

Change Data Years: Select one Apply

Daily Average Asthma Hospitalizations by Month, New York State, 2000-2002



Asthma Daily Average Hospitalizations by Month, New York State, 2000-2002

Month	2000	2001	2002	2000-2002
Jan	145	126	150	140
Feb	122	120	130	124
Mar	106	124	112	114
Apr	105	114	103	107
May	106	124	110	113
Jun	96	85	83	88
Jul	64	64	69	66
Aug	68	71	63	67
Sep	129	105	114	116
Oct	145	139	141	142
Nov	127	129	135	130
Dec	121	127	128	125

About Asthma
- About Asthma
- About Data
- Export Data
- Other Asthma Data
- Contact

Learn More
- Environmental Public Health Tracking Home
- About Environmental Health, Tracking and Exposure
- Metadata Search
- Other Data
- Tracking Program
- Glossary
- Tracker "How To" Guide
- Frequently Asked Questions

Enhancing Surveillance Capacity

Enhancing Surveillance Capacity: Improved Reporting to CMR

Completeness of Reporting

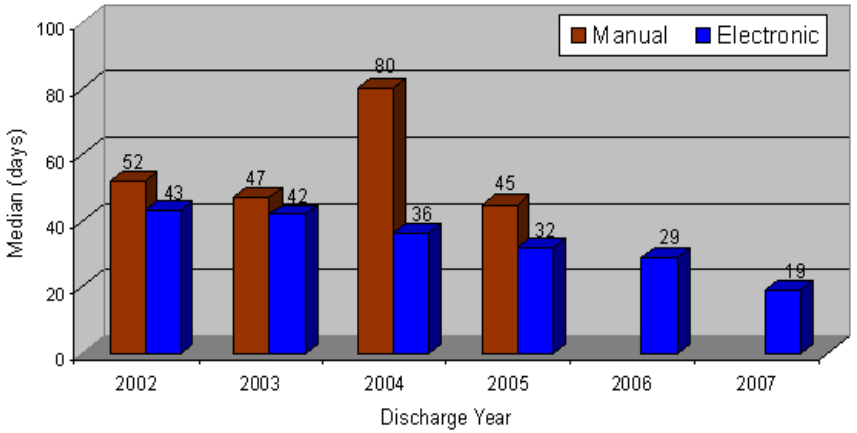
Prevalence* of selected major birth defects in New York State
(Birth years: 2002-2004)

Birth defect Category	NY City	Upstate NY	NYS	NBDPN	95% CI Range
Central nervous system defects					
Anencephalus	0.4	0.4	0.4	2.5	2.3-2.7
Spina bifida without anencephalus	**1.8**	**2.1**	**1.9**	3.7	3.4-3.9
Encephalocele	0.3	**0.7**	**0.5**	0.9	0.8-1.0
Eye defects					
Anophthalmia/ microphthalmia	0.6	0.7	0.6	2.1	1.9-2.3
Cardiovascular defects					
Common truncus	**0.9**	**0.3**	**0.6**	0.8	0.7-0.9
Transposition of great arteries	**4.0**	**4.9**	**4.5**	4.7	4.5-5.0
Tetralogy of Fallot	**4.7**	**4.7**	**4.7**	3.9	3.8-4.2
Endocardial cushion defect	**3.0**	**2.9**	**2.9**	4.4	4.1-4.6
Hypoplastic left heart syndrome	**2.2**	**2.6**	**2.4**	2.4	2.2-2.6
Orofacial defects					
Cleft palate without cleft lip	**4.5**	**6.4**	**5.5**	6.4	6.1-6.7
Cleft lip with and without cleft palate	5.3	**8.5**	6.9	10.5	10.1-10.9
Gastrointestinal defects					
Esophageal atresia/ tracheosophageal fistula	**2.4**	**2.3**	**2.3**	2.4	2.2-2.6
Rectal and large intestinal atresia/stenosis	**4.2**	**4.7**	**4.5**	4.8	4.5-5.1
Musculoskeletal defects					
Reduction deformity, upper limbs	1.3	**2.2**	1.8	3.8	3.5-4.0
Reduction deformity, lower limbs	0.7	1.1	0.9	1.9	1.7-2.1
Gastroschisis	1.5	**2.2**	1.9	3.7	3.5-4.0
Omphalocele	**1.1**	**1.5**	**1.3**	2.1	1.9-2.3
Diaphragmatic hernia	1.5	1.9	1.7	2.9	2.7-3.1
Chromosomal defects					
Trisomy 13	**0.8**	**0.8**	**0.8**	1.3	1.2-1.5
Down syndrome(trisomy 21)	**11.3**	**13.2**	**12.3**	13.7	13.2-14.1
Trisomy 18	1.0	1.2	1.1	2.4	2.2-2.6

*- Prevalence (number of defects per 10,000 live birth)

Bold prevalences are within the range of the 11 active registries
Boxed prevalences are equal to or greater than the lower limit of the 95% CI range

Timeliness of Reporting



Accuracy of Reporting

Table 2. The number of cases and the percent of unspecified codes for the selected birth defect category by case reporting systems, paper-based (manual) and web-based (HPN) reporting

Selected birth defect category	BPA codes (unspecified BPA codes)	Total	Cases with unspecified codes N	Cases with unspecified codes %	% of cases with unspecified codes by reporting system Manual	% of cases with unspecified codes by reporting system HPN	p-value
Other specified anomalies of heart	746.8, 746.9 (746.880, 746.900, 746.990)	1,228	329	26.8	32.9	17.6	<0.001
Other specified anomalies of pulmonary artery	747.3 (747.380, 747.390	2,179	68	3.1	3.7	2.5	<0.05
Other obstructive defects of renal palvis/ureter	753.2 (753.290)	4,299	353	8.2	12.7	3.5	<0.001
Total selected cases		7,706	750	9.7			

Enhancing Surveillance Capacity: Geographic Aggregation Tool

- Increasing demand to produce local community health maps and detect unusual patterns of disease.
- Risk of disclosure of confidential information when showing small area data.
- Rates of disease can be unreliable due to small numbers.

Enhancing Surveillance Capacity: Geographic Aggregation Tool

- Merges small areas with neighboring areas to provide more stable rates of disease and/or protect confidentiality

- User decides how much aggregation is needed
  - Based on cases and/or underlying population
  - Example 250 births and at least 3 low birth weight births

Download at: http://www.albany.edu/faculty/ttalbot/GAT/

For further information contact:
Thomas Talbot at thomas.talbot@health.ny.gov

NATIONAL Environmental Public Health Tracking Program

Geographic Aggregation Tool

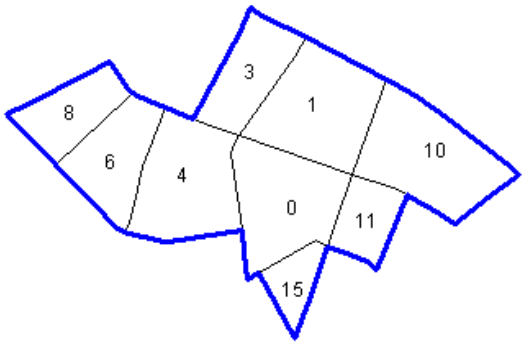
Original Census Block data†

Block	Cases
122300/2004	10
122300/2005	11
014500/3005	3
014500/3007	4
014500/3008	0
014500/3009	1
014500/3010	15
103202/2001	8
103202/2002	6

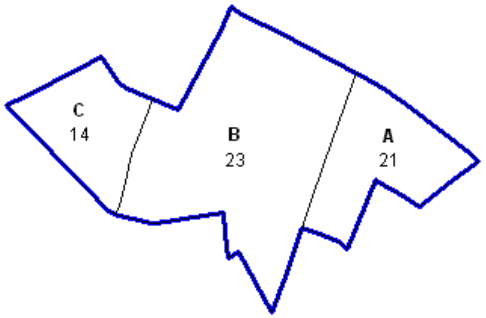
GAT

Regions

Block	Cases	Region
122300/2004	10	A
122300/2005	11	A
014500/3005	3	B
014500/3007	4	B
014500/3008	0	B
014500/3009	1	B
014500/3010	15	B
103202/2001	8	C
103202/2002	6	C



Cases	Region
21	A
23	B
14	C

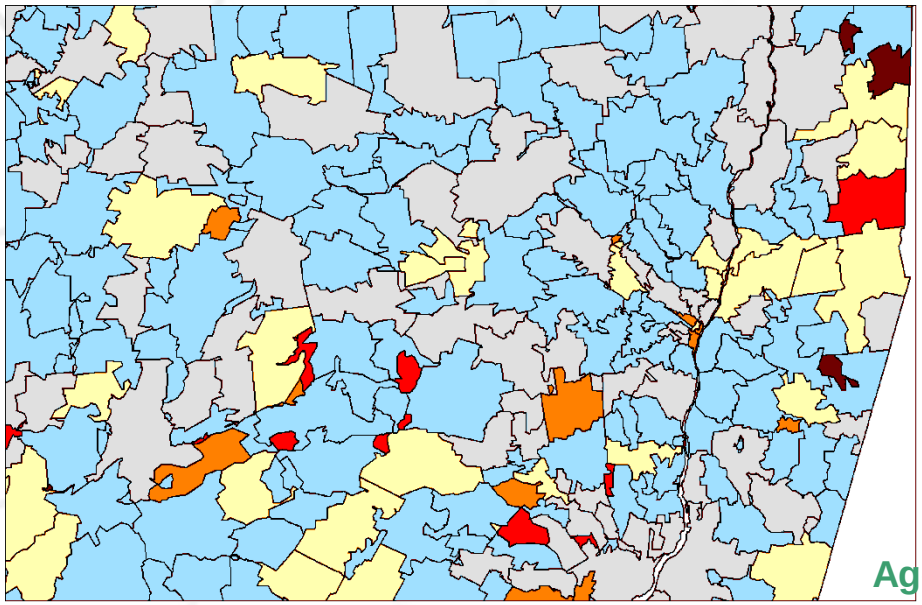


† Simulated data

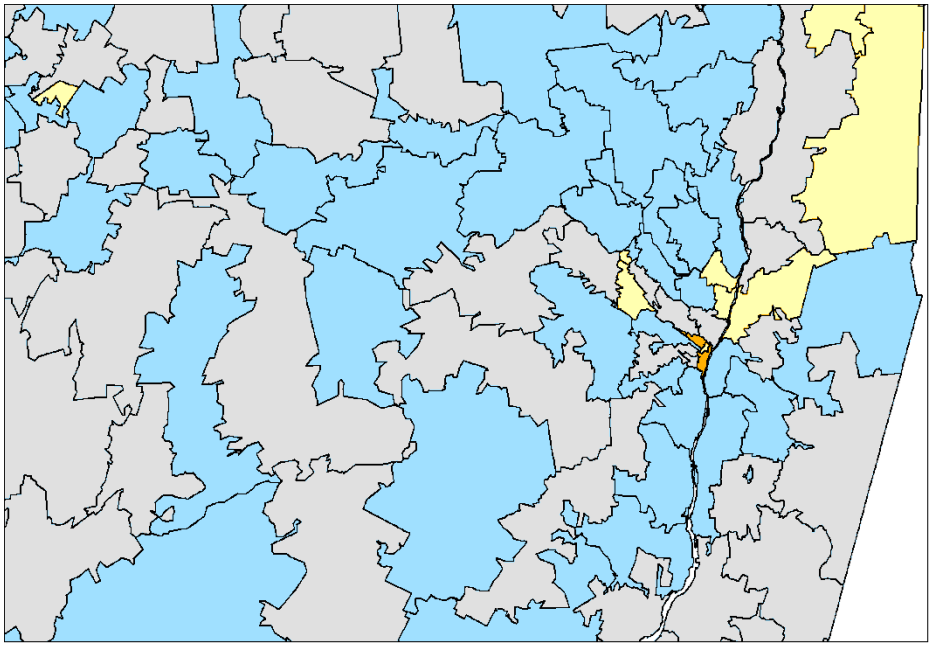
Thomas Talbot

Geographic Aggregation Tool: Results

Original ZIP Codes
3 Years Low Birth Weight Incidence Ratios



Aggregated to 250 Births per ZIP Code Group



Low Birth Weight Incidence
Ratio of Observed to Expected

3 to 16.7	(20)	
2 to 3	(27)	
1.6 to 2	(72)	
1.2 to 1.6	(206)	
0.8 to 1.2	(458)	
0 to 0.8	(815)	

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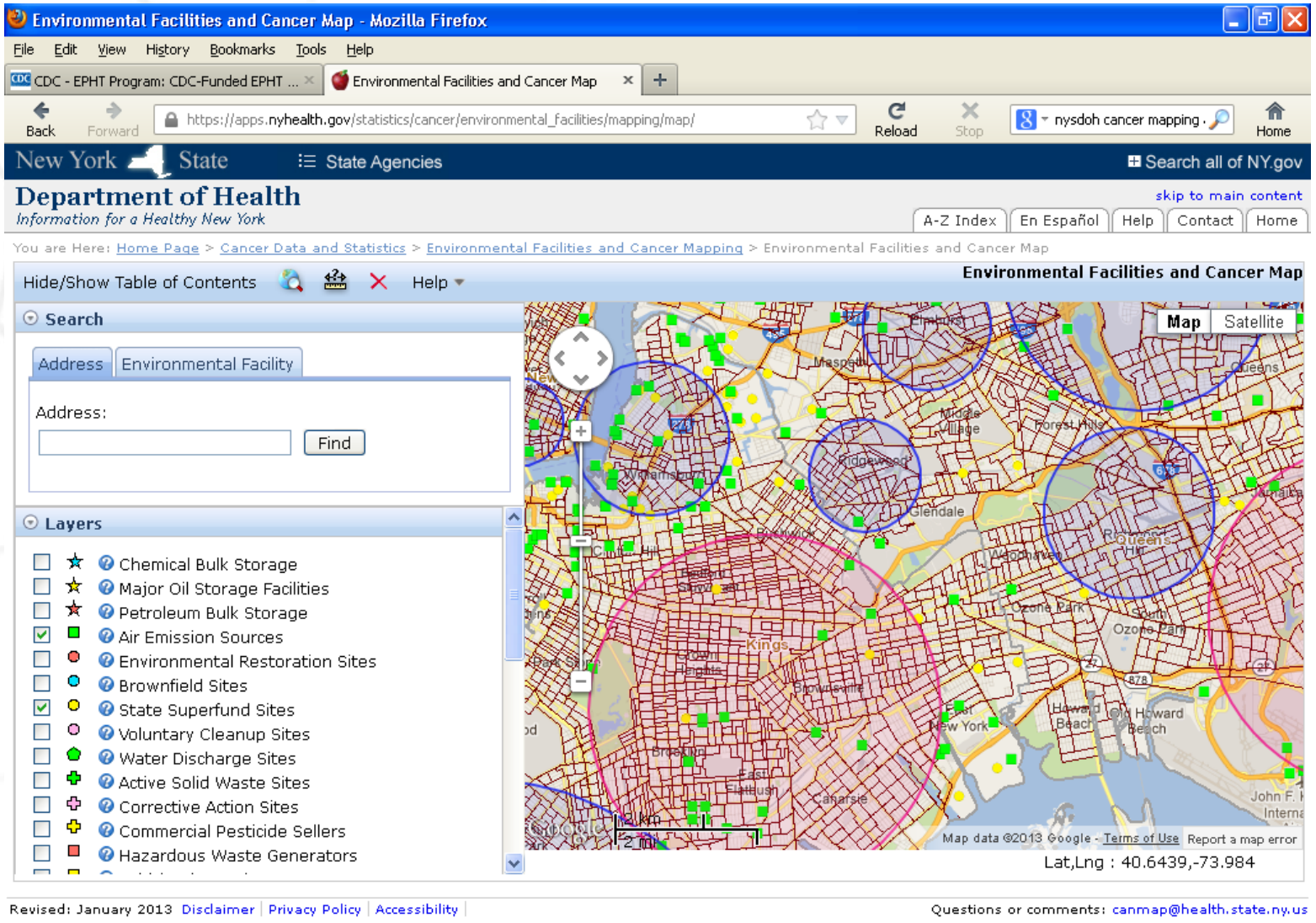
Geographic Aggregation Tool Requirements

- Works with various levels of geography
  - Census blocks, tracts, towns, ZIP codes etc
  - Can nest one level of geography in another
    - Ex., Census tracts are aggregated. Aggregated areas do not cross county boundaries
- Uses open source free software (R)
- Outputs results for use in mapping programs
  - GIS Programs (MapInfo, ArcMap)
  - Free online mapping apps (Google Maps, IndieMapper)

Enhancing Surveillance Capacity: Data Linkage and Visualization



Available at: http://www.health.ny.gov/statistics/cancer/environmental_facilities/mapping/

Enhancing Surveillance Capacity: Messaging with Cancer Mapping

Environmental Facilities and Cancer Mapping

The New York State Environmental Facilities and Cancer Mapping project is designed to present information about cancer cases in the State as well as the location of environmental facilities. Cancer is a very common disease. One of every two men and one of every three women will be diagnosed with cancer at some time in their lives.

The Environmental Facilities and Cancer Map shows:

- The number of people diagnosed with cancer (cancer counts, 2005-2009) in small geographic areas of New York State
- Highlighted areas where cancer is higher or lower than expected
- The locations of certain environmental facilities.

Links to more information about cancer and how to interpret cancer data are also provided.

Important Information

About Cancer Risk

Cancer risk is primarily based on individual risk factors. Research suggests that at least 40% of all cancers are due to lifestyle factors such as tobacco use, diet, physical inactivity, and alcohol use. Other important individual risk factors are age, workplace exposures, family history and personal medical history, including radiation exposure and infections. Individual risk factors affect people over their lifetimes, and when people move, they carry their individual risks with them.

Cancer is a very common disease. In New York State, one out of every two men, and one of every three women, will be diagnosed with cancer at some time in their lives.

There are actions you can take to reduce your risk of getting cancer. Changing your lifestyle by quitting smoking, eating a healthy diet, maintaining a healthy weight, limiting alcohol use and exercising regularly may significantly reduce your risk. Additional information on reducing risk for specific types of cancer is available at Learn More About Different Types of Cancers.

Talk with your health care provider about recommended cancer screenings. Getting screening tests regularly may find certain cancers early, when treatment is likely to work best.

About Cancer Maps

The map **cannot explain why** cancer may be higher or lower in certain areas. It does not show that an environmental facility causes cancer.

- **The map does not contain any information about important known individual risk factors for cancer.** These include factors such as tobacco use, alcohol use, family history, radiation exposure, medical history, workplace exposures, infections, diet, sunlight, and physical activity, which are known to play important roles in cancer.
- **The environmental facility information only shows the locations of facilities.** It does not contain any information about whether chemicals are released from these facilities or the likelihood that people may have been exposed to any chemicals that could cause cancer.
- **The cancer information reflects people's addresses at the time of their cancer diagnoses.** It is possible that people with cancer lived elsewhere before their diagnoses. This is important because cancer can take many years (5 to 40 years) to develop. This is referred to as cancer latency. People's exposures earlier in life, at a different address, may have contributed to their cancer. People also take their personal risk factors with them when they move from place to place.
- **The map shows only one five-year time period of cancer information.** Experience with cancer mapping shows that changing the specific timeframe selected can change areas that are highlighted as higher or lower than expected.

Understanding the Map

- About the Data
- Using the Map
- Frequently Asked Questions
- Learn More About Different Types of Cancers
- Learn More About Different Types of Environmental Facilities
- Chronic Disease Teaching Tools

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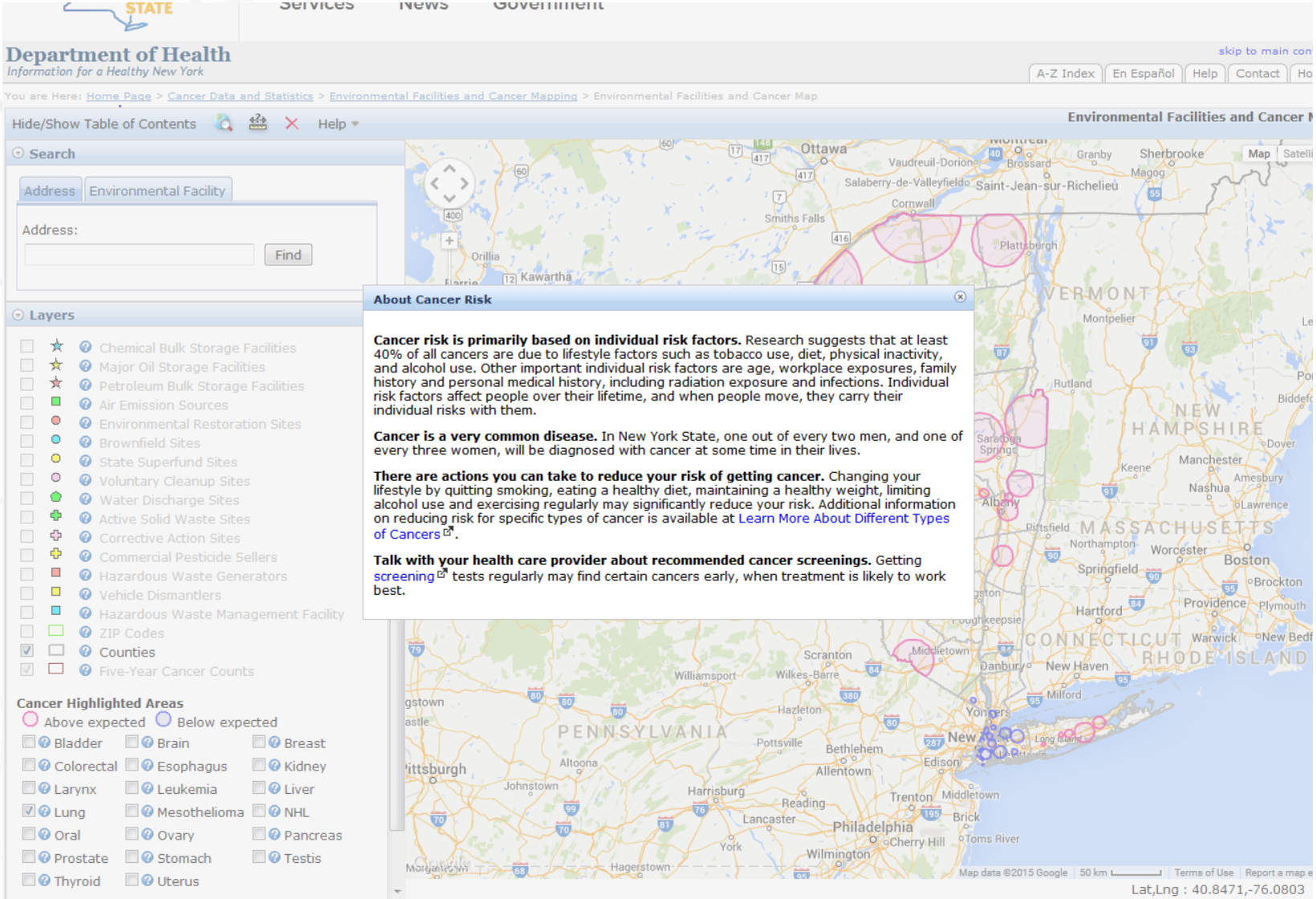
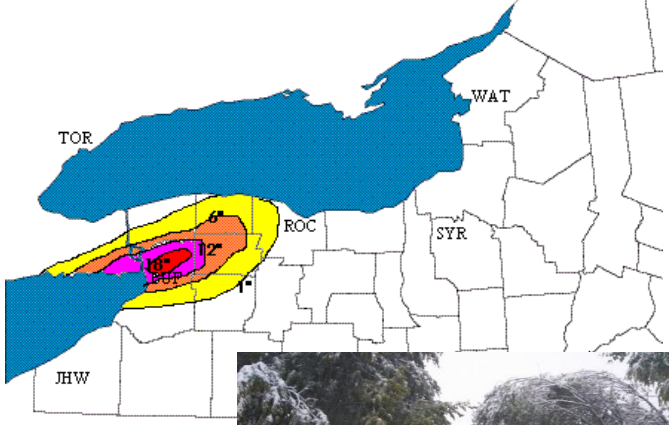
Enhancing Surveillance Capacity: Messaging with Cancer Mapping

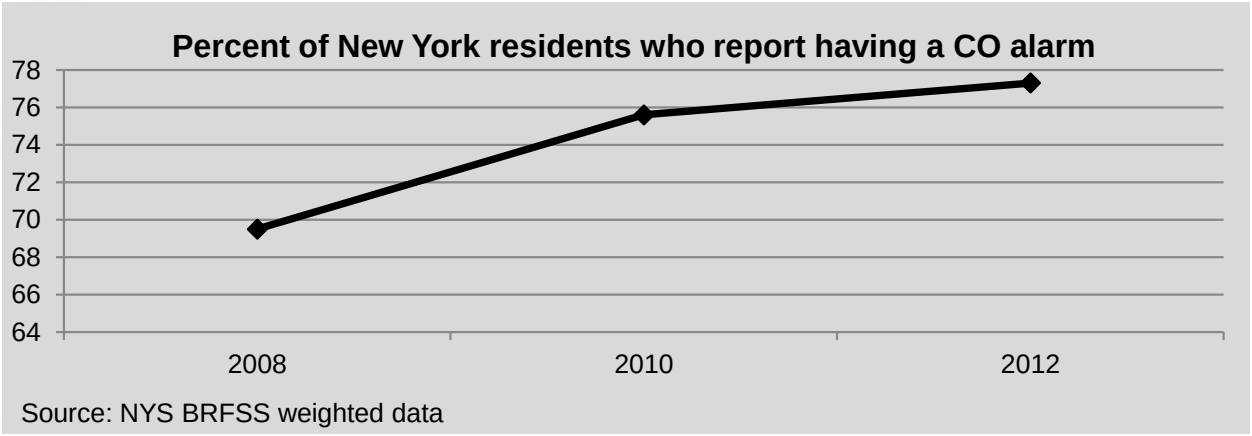


Public health actions

Winter Storm "Aphid"



- October 2006 winter storm resulted in extensive power outages
- Partnership with DOH programs with real-time hospital data suggested increase in CO poisonings
- Provided basis for rapid implementation of study
  - Assess impact of poisoning and better understand public CO poisoning awareness and prevention
  - Evaluate environmental factors



Public Health Actions: Peace Bridge

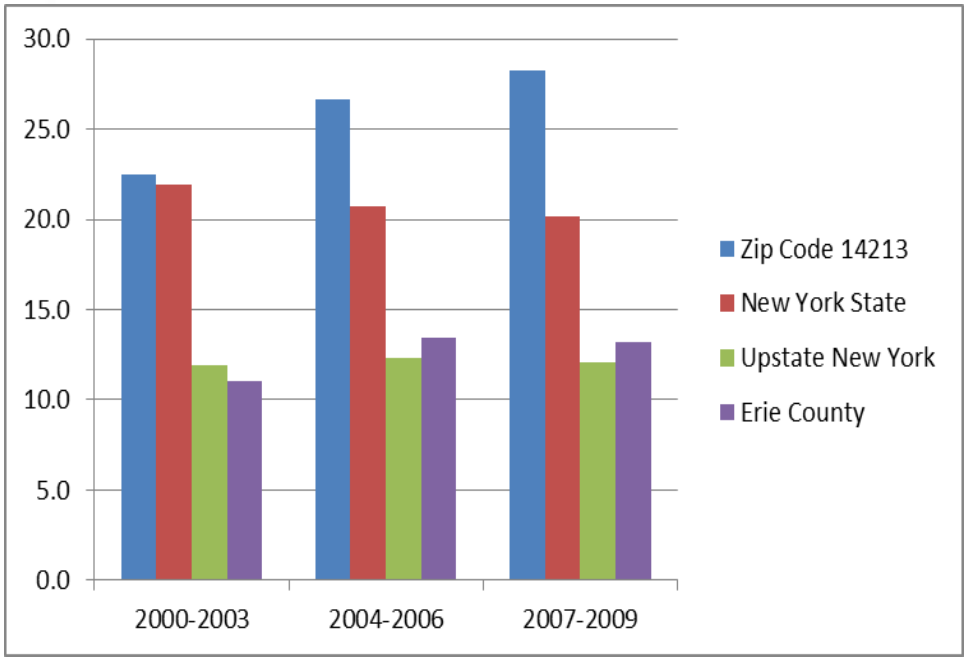


Table. Asthma hospitalization rates in 14213 and surrounding ZIPs compared to Erie, Upstate NYS, and all NYS.

	Hospitalizations			Rate per 10,000 population		
ZIP Code	2000-2003	2004-2006	2007-2009	2000-2003	2004-2006	2007-2009
14201	161	133	132	30.5	34.2	35.5
14202	17	25	21	11.1	20.7	17.8
14207	193	171	186	21.0	25.2	28.1
14213	253	219	220	22.5	26.6	28.3
14222	43	41	38	8.3	10.7	10.2
NYS	167,543	120,385	117,567	21.9	20.7	20.1
Upstate NYS	52,683	41042	40,339	11.9	12.3	12.1
Erie County	4,159	3,707	3,613	11.0	13.4	13.2

“Brownfields” Redevelopment

- Partnership with staff funded by ATSDR
- Enhance built environment and build community interaction
- Provide community indicator data
  - Enhance community awareness on key health outcomes of interest/concern
  - Support additional grant opportunities
- Assist in EH outreach and education message

Community Investigations

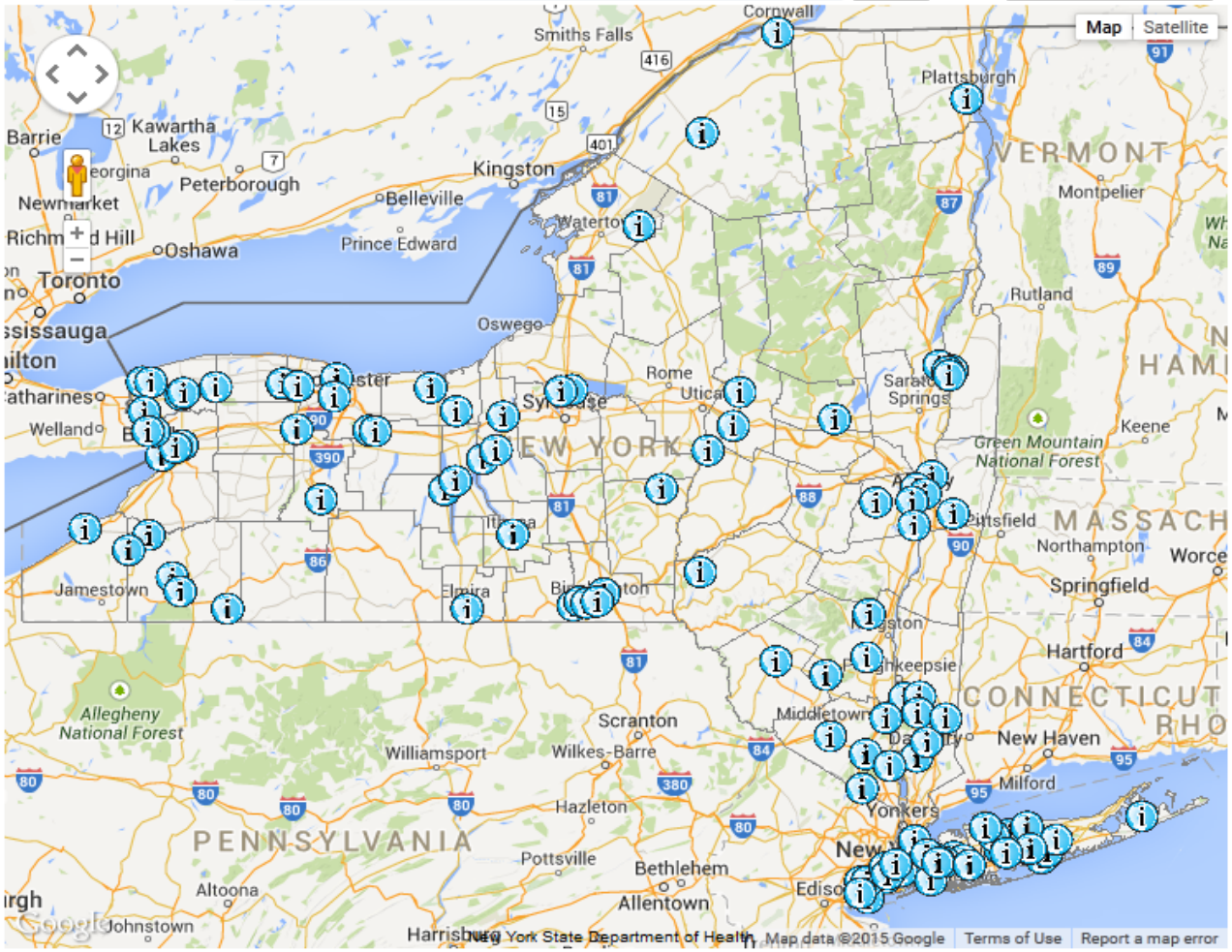
- DOH staff are frequently involved in investigations to respond to community concerns
- Results summarized in public health assessments/consultations and other reports, fact sheets, etc.
- Historically, available in paper copy and electronically
  - Not always easy to access
- EPHT staff developed mapping application to provide community level access to community investigations

Community and Environmental Health Reports

This map shows locations where DOH conducted certain environmental health investigations in New York State. Click on the map symbols to view links to the full reports or the list tab to view a list of reports by county.

View by: Map | List

Find Address/Report: Find Zoom to NY State



About Reports

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- How to Find Reports
- More Information
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Learn More

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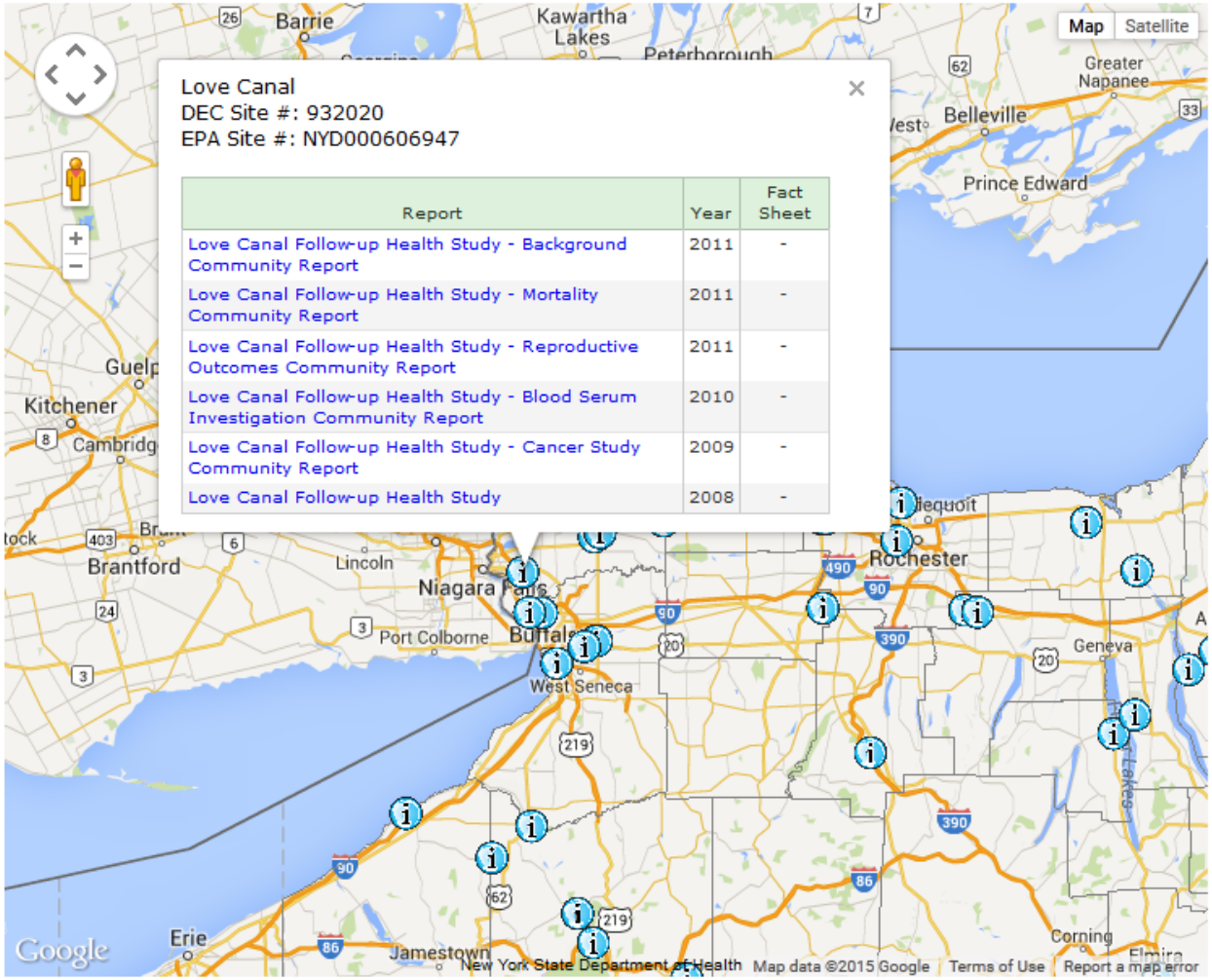

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Lead Poisoning Prevention

- Partnership between NYSDOH EPHT and Lead programs
- Geocoding addresses of children with blood lead levels > 10 µg/dL
- Provide role-based access to local health departments

Partnerships and Collaborations

NATIONAL Environmental Public Health Tracking Program

Collaborations

- Project with Harvard to improve space-time clustering software (SaTScan) and provide training
- Collaborating with NYS, NYC and FL EPHT/BRACE and NASA researchers from Marshall Space Flight Center (AL) to evaluating heat stress indicators and develop heat vulnerability maps
- Collaborating with CSTE, CDC and several states to develop fine-scale estimates of life expectancy
- EPHT sub-county data project

Future Directions

- More community level data
- Enhanced data linkage
- Improved tools to enable data visualization while remaining within regulatory guidelines

The End