

Tonawanda Community Air Quality Study

Division of Air Resources
Community Presentation

November 18, 2008

Sheridan Parkside Community
Center

Tonawanda, NY



Today's Topics

- Purpose of the Study
- Study Plan Overview
- 1 Year of Air Monitoring Results
- Next Steps



Purpose of the Study

- Participate in the National Ambient Air Toxics Monitoring Strategy;
- Characterize the degree and extent of local-scale air toxics concerns;
- Provide information for the community and State and Local government to identify the need for implementing risk reduction strategies.



JOHN G. DAVIS

AIR POLLUTION
IN
ERIE COUNTY

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Why Was Tonawanda Selected ?

- Community concerns about ambient concentrations of benzene and other compounds;
- EPA's 1999 National Air Toxics Assessment (NATA) results for Erie County;
- Coke Oven Residual Risk Assessment prepared by EPA



Tonawanda Study Plan

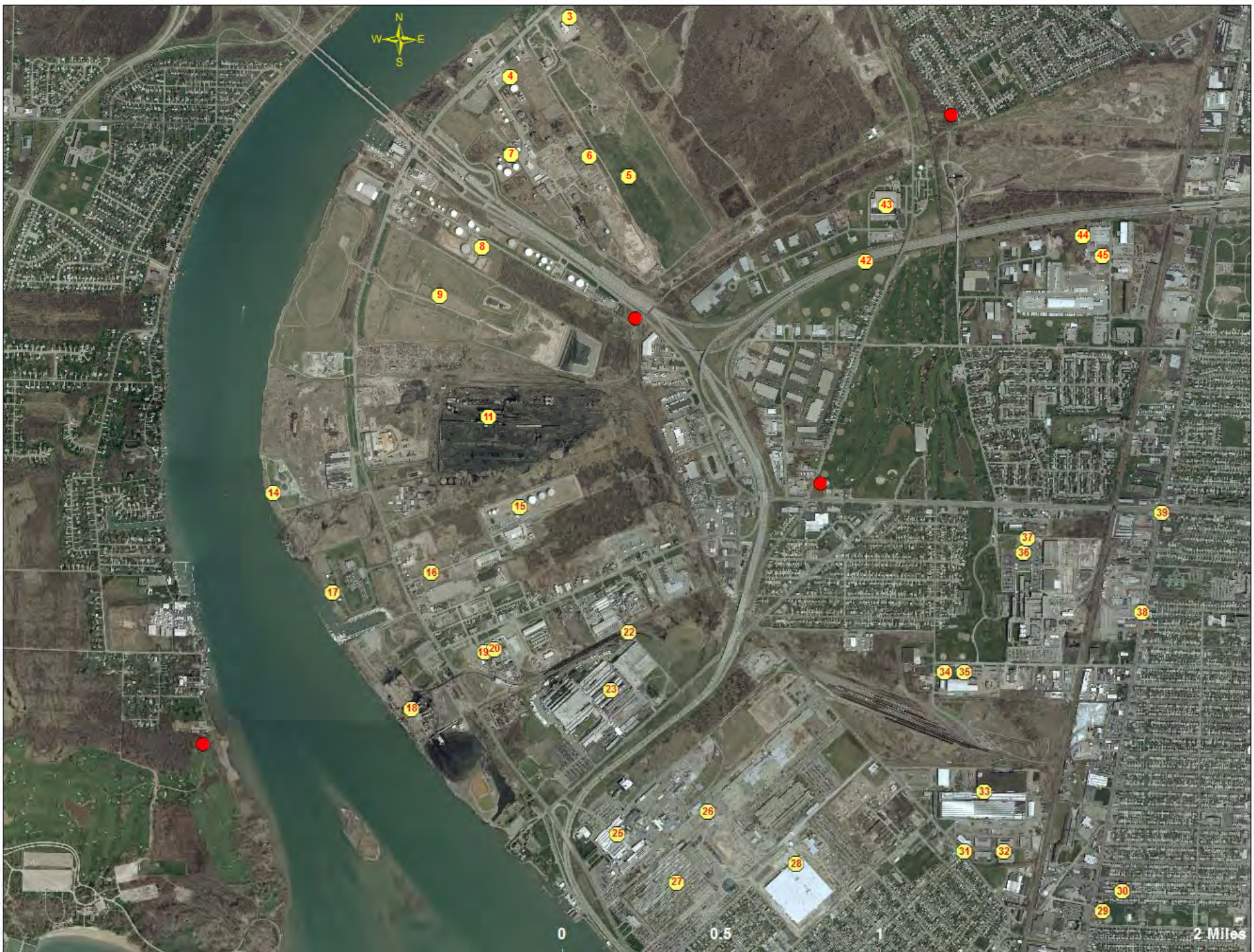
- Collected monitoring data from four sites for one year
- Analyze pollutant specific data
 - Evaluate influence of wind direction on monitored concentrations
 - Compare annual average concentrations to health-based guidelines and characterize risk
 - Assess emissions and potential contribution to monitored concentrations
 - Mobile sources, large (major) and small (area) industrial and manufacturing sources



Tonawanda Study Plan

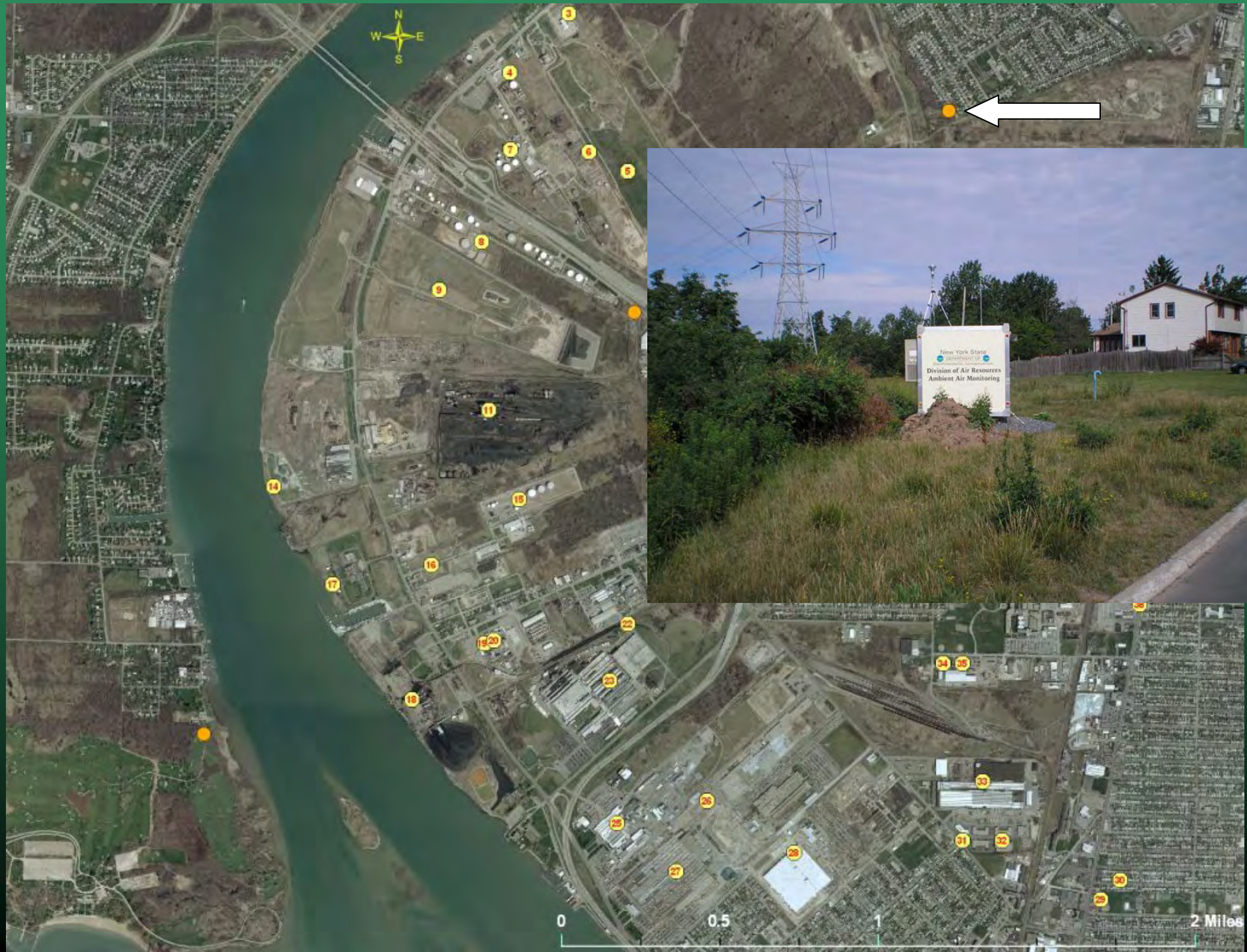
- Enhance emission inventory for large and small sources
- Model these emissions to:
 - Allow for comparison to monitored values
 - Allow for analysis of previously modeled air toxics (EPA's NATA)
 - Evaluate a new multi-facility modeling tool developed by EPA
 - Evaluate previous Coke Oven modeling results, conducted for Residual Risk Assessment













Air Toxics Measured

- 44 Volatile Organic Compounds (VOCs) and 12 Carbonyls;
- 1 in 6 day sampling schedule (24 hour sample);
- 15 of the chemicals are high priority urban air toxics targeted for reductions by the 1990 Clean Air Act.



Study Progress Report

- Air monitors and meteorological station operated for one year successfully
- Data capture greater than 90% for all sites
- The comparison of monitored data to:
 - Annual Guideline Concentration (AGC)
- Model ready inventory
 - for major sources complete
 - for area sources under review
 - for mobile sources under review



Fine Particulate Matter (PM_{2.5})

- New York State and the National Ambient Air Quality Standard (NAAQS), 15 µg/m³
 - Brookside Terrace Yearly average, 12.6 µg/m³
- New York State and NAAQS 24-hour standard, 35 µg/m³ (98th percentile)
 - 24-hour measured concentration at Brookside Terrace, 32.1 µg/m³



Sulfur Dioxide (SO₂)

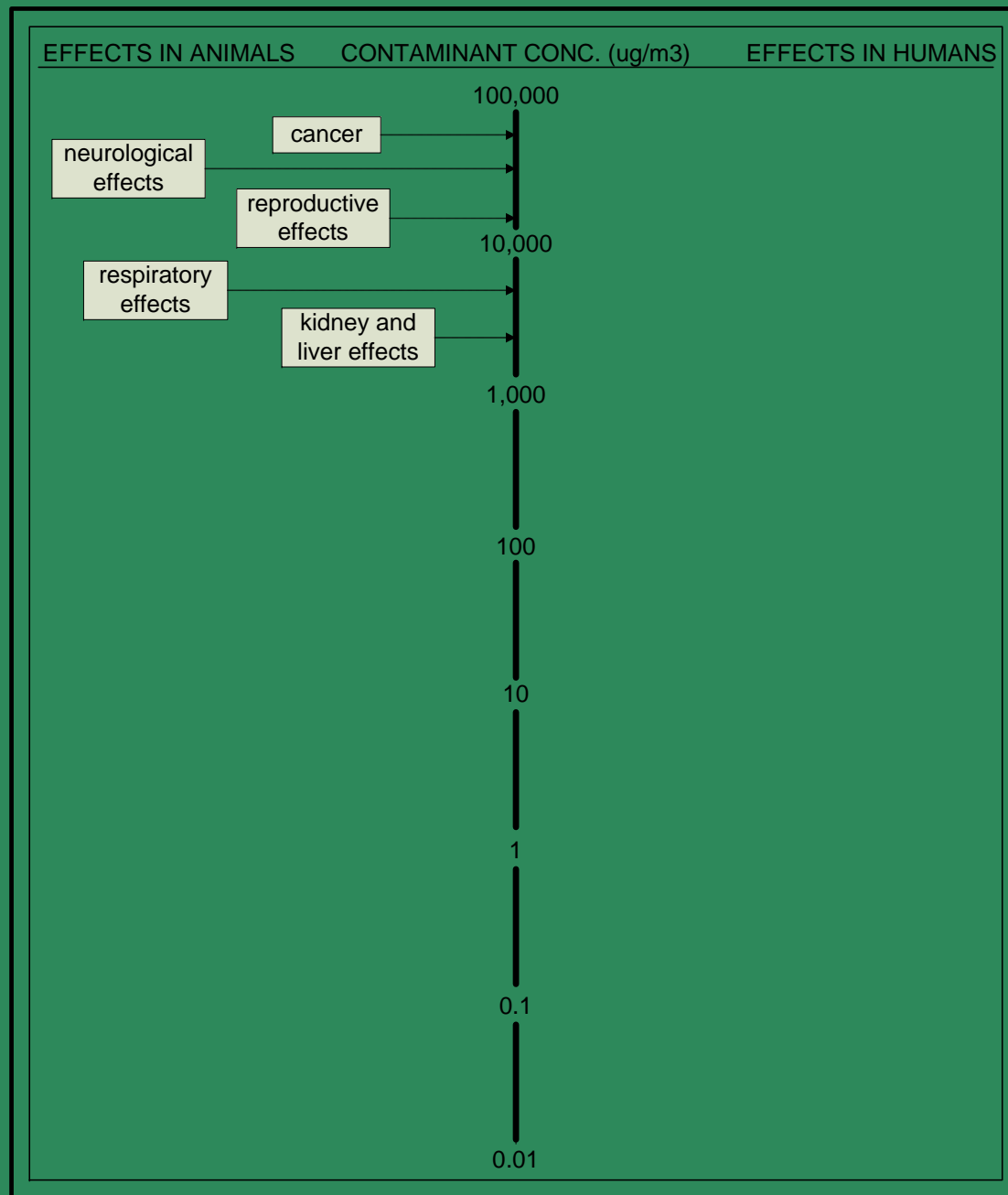
- New York State and the National Ambient Air Quality Standard (NAAQS), **0.03 ppm**
 - Tonawanda Yearly average, **0.003 ppm**
- New York State and NAAQS 24-hour standard, **0.14 ppm**
 - Sampling days
 - Minimum 24 hour value, **< 0.0003 ppm**
 - Maximum 24 hour value, **0.008 ppm**

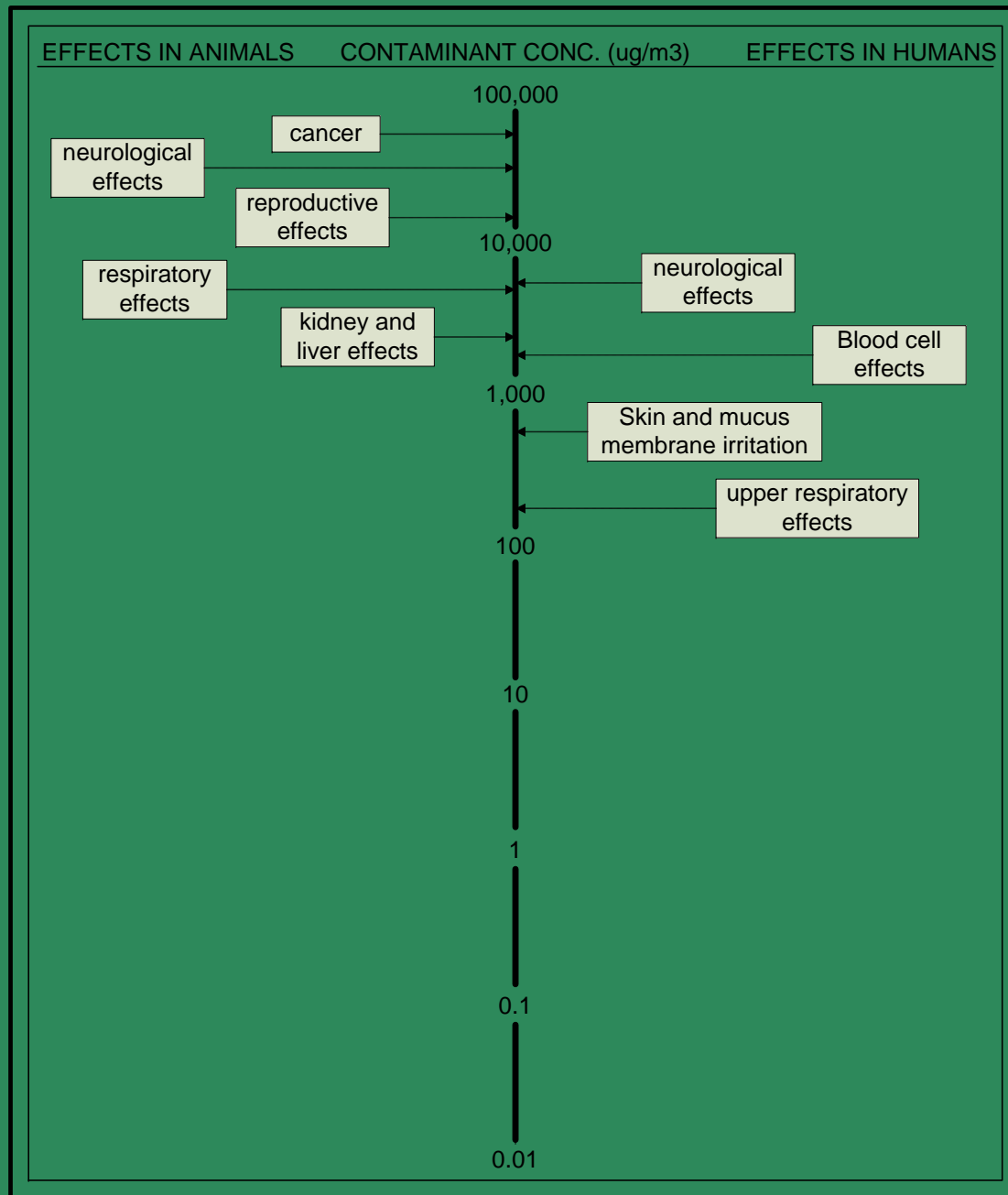


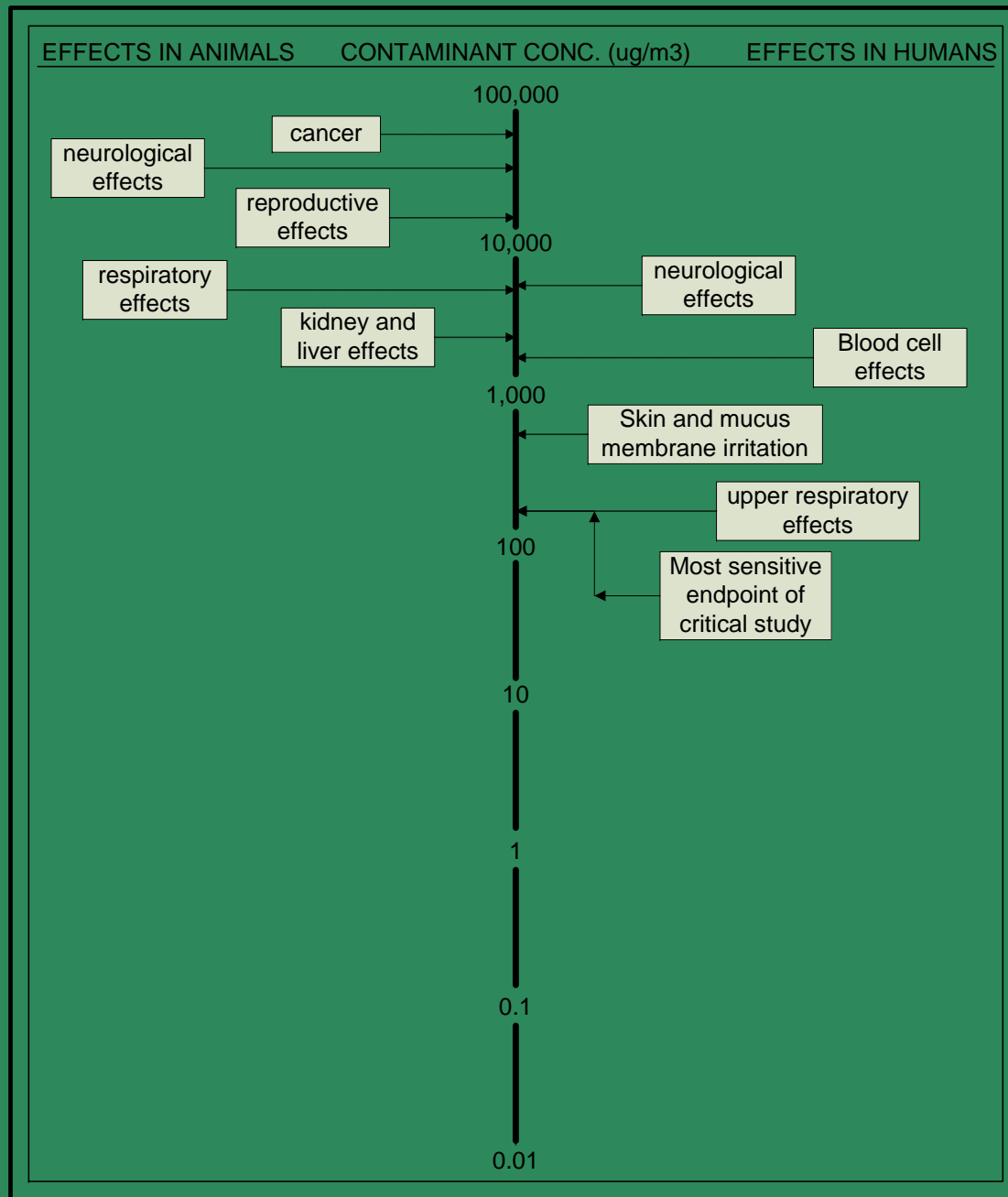
Risk Assessment Terminology

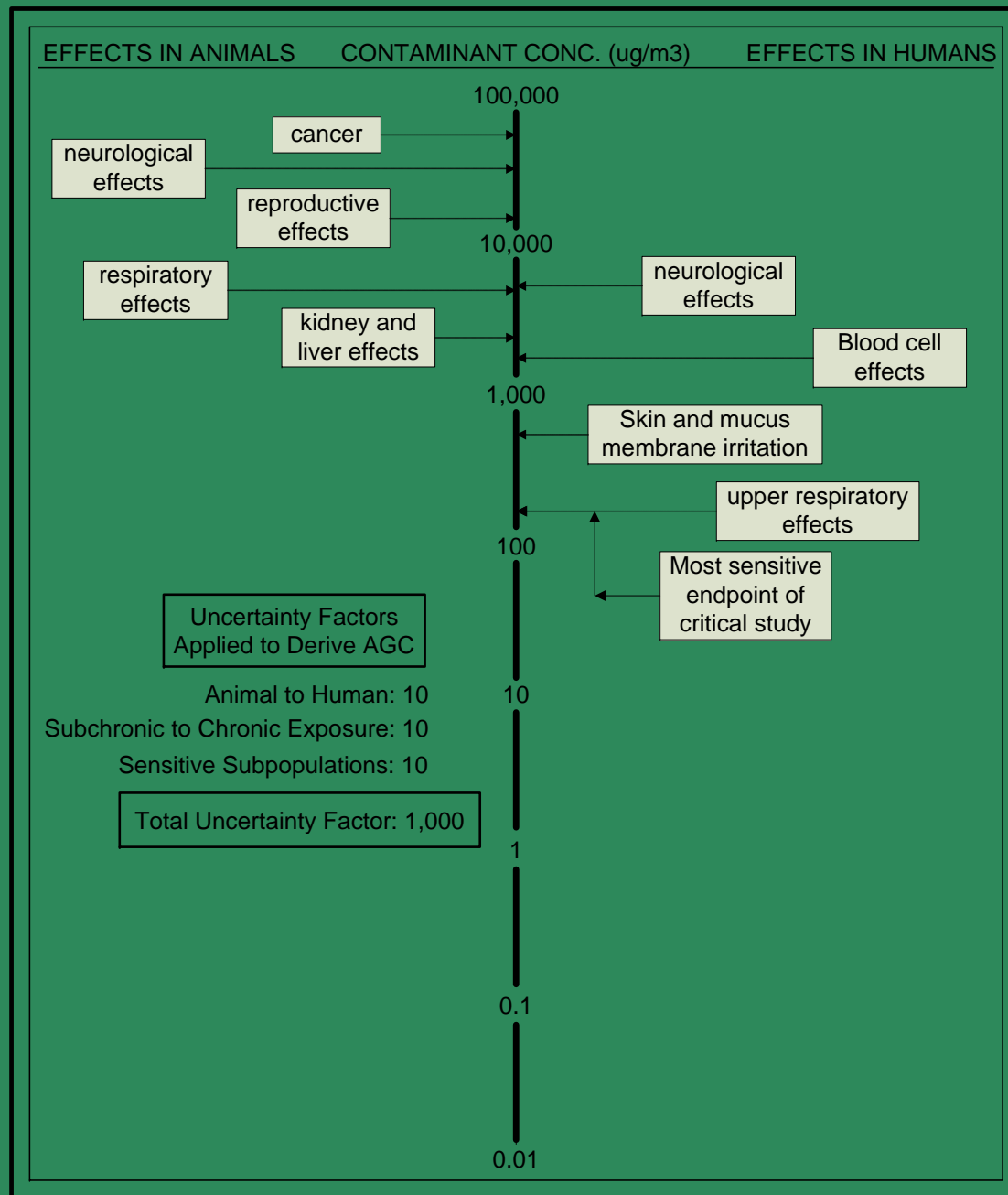
- What is an Annual Guideline Concentration (AGC)?
- What is non-cancer risk?
- What is cancer risk?

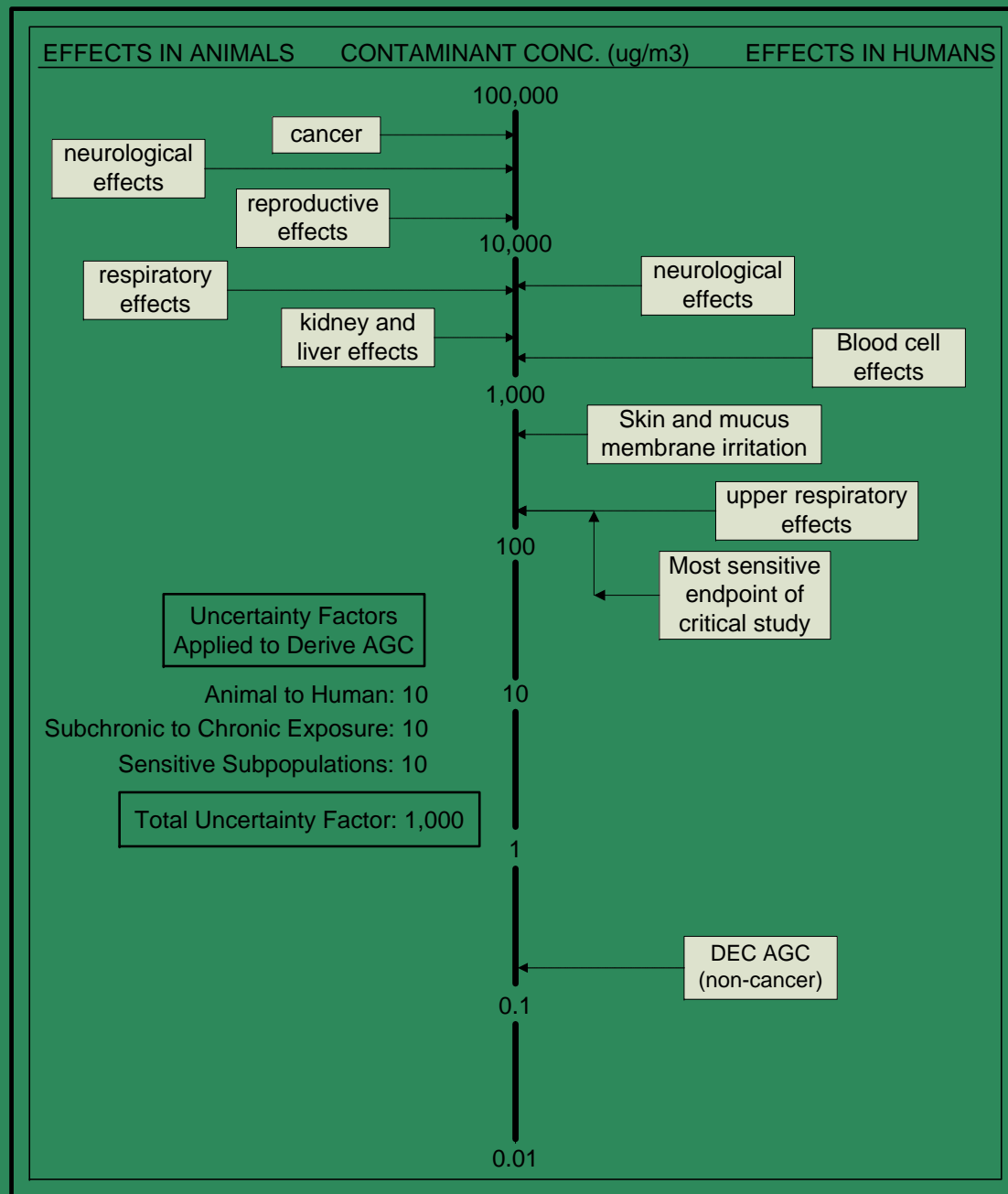








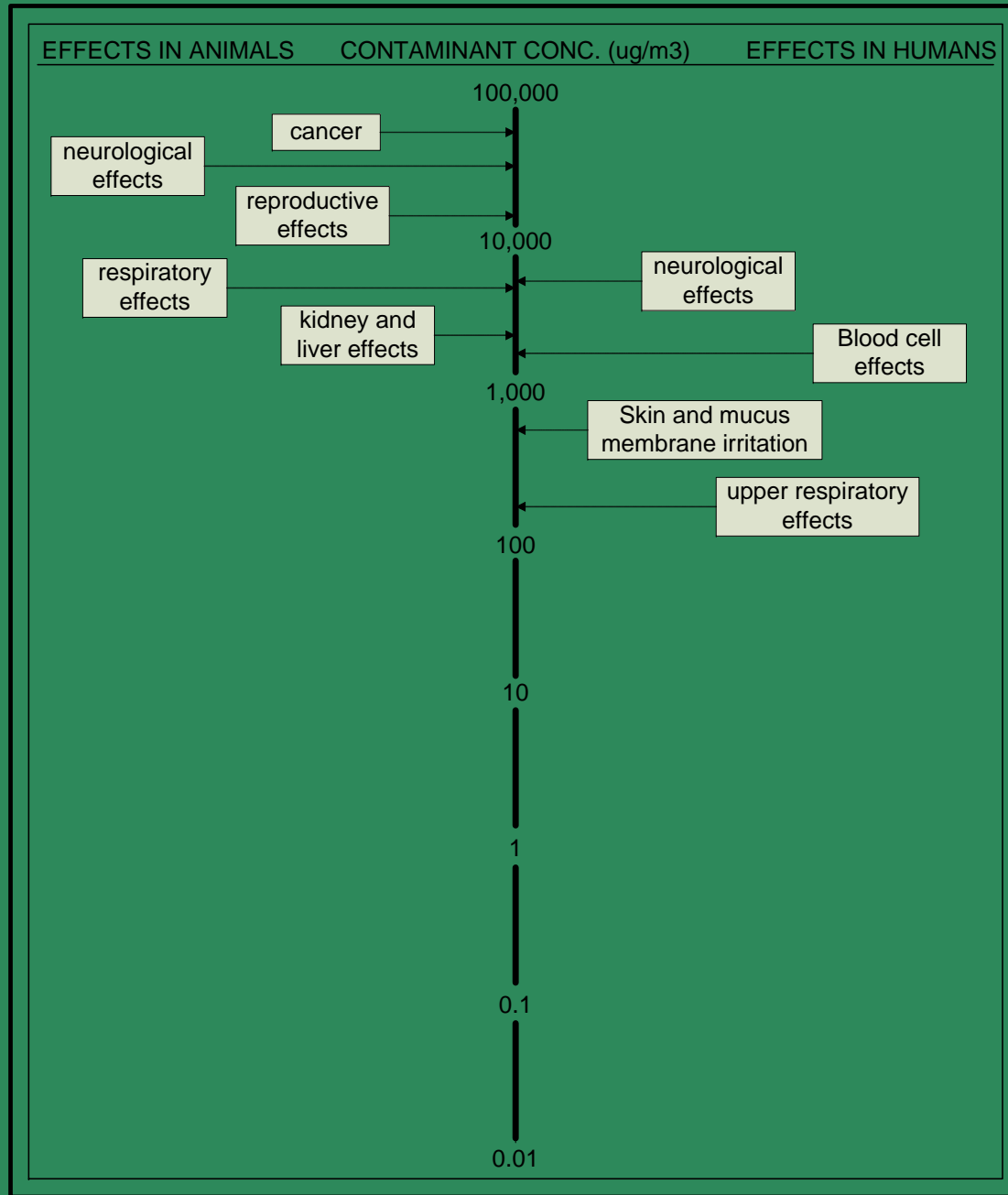


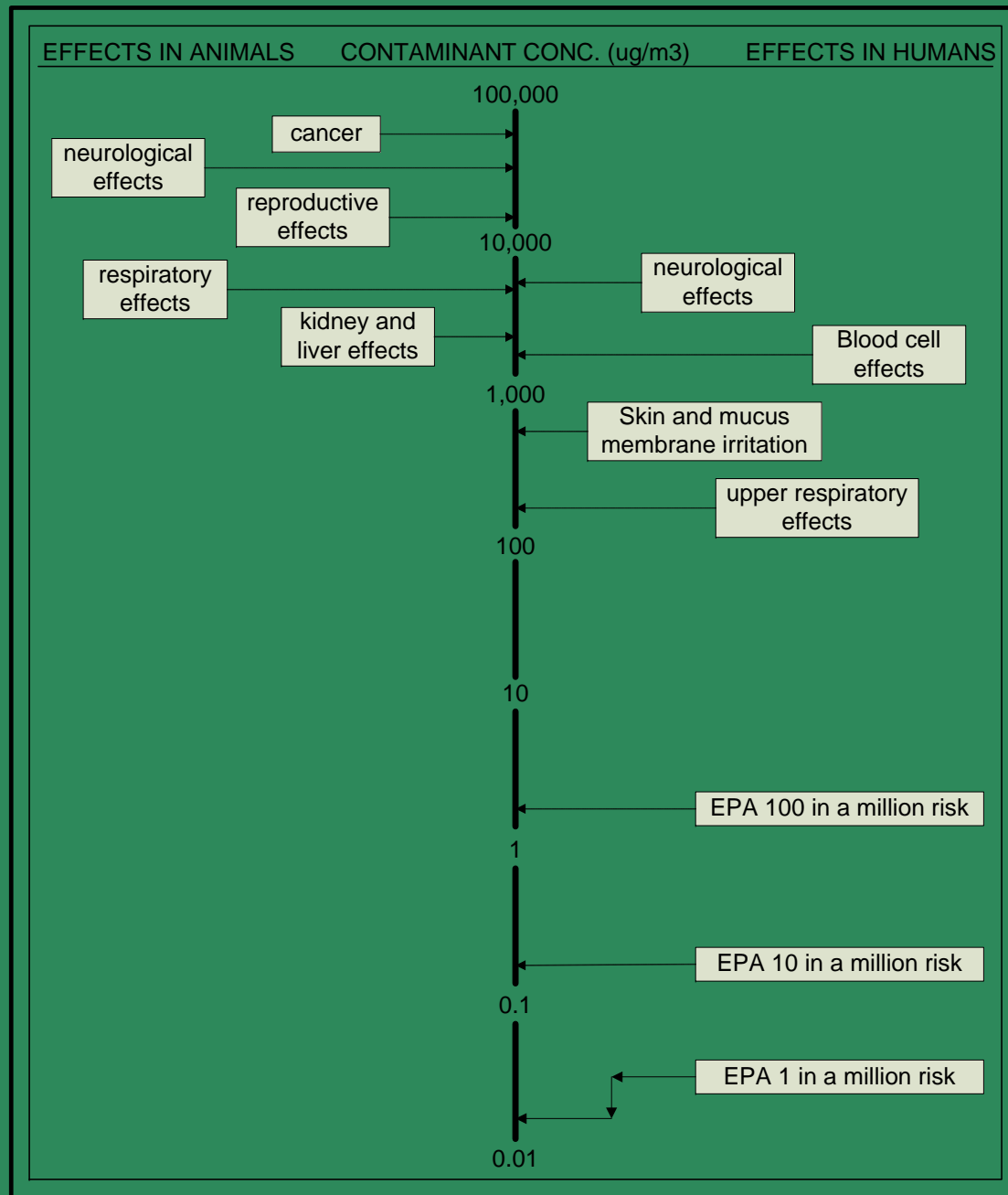


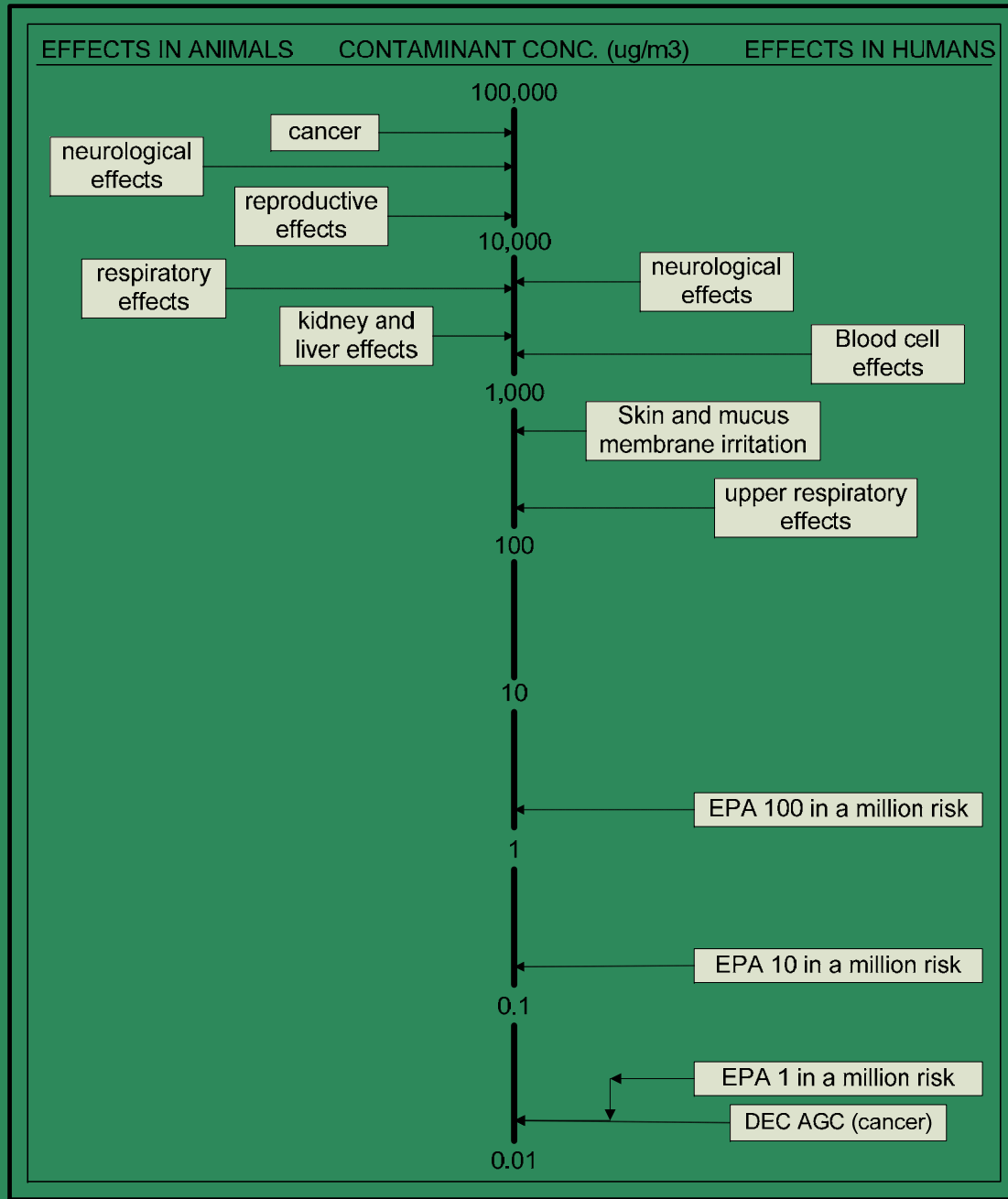
Non-Cancer Risk

The risk associated with health effects other than cancer that have AGCs based on animal or human toxicity studies. The AGC represents a value that is likely to be without appreciable risk of harmful effects during a lifetime.









Cancer Risk

One in one million – the AGC represents the likelihood that up to one person, out of one million equally exposed people would contract cancer if exposed continuously (24 hrs/day) to that concentration over a lifetime.



Air Toxics Results

- Presenting results for 6 compounds
 - Five had annual results above the AGC
 - One was of concern to the community
- 9 additional compounds had results with consistent detectable concentrations but below the AGC



Compounds greater than the AGC

- Volatile Organic Compounds
 - Benzene
 - Acrolein
 - Carbon tetrachloride
- Carbonyls
 - Formaldehyde
 - Acetaldehyde



Benzene Sources

- Manmade sources include:
 - Tobacco smoke
 - Motor vehicle
 - Oil and natural gas production
 - Petroleum refining & distribution
 - Burning coal, oil and gas
 - Gasoline service stations
 - Coke ovens and coal chemical manufacturing
 - Rubber tire manufacturing
 - Storage or transport of benzene
- Natural sources
 - Emissions from wildfires



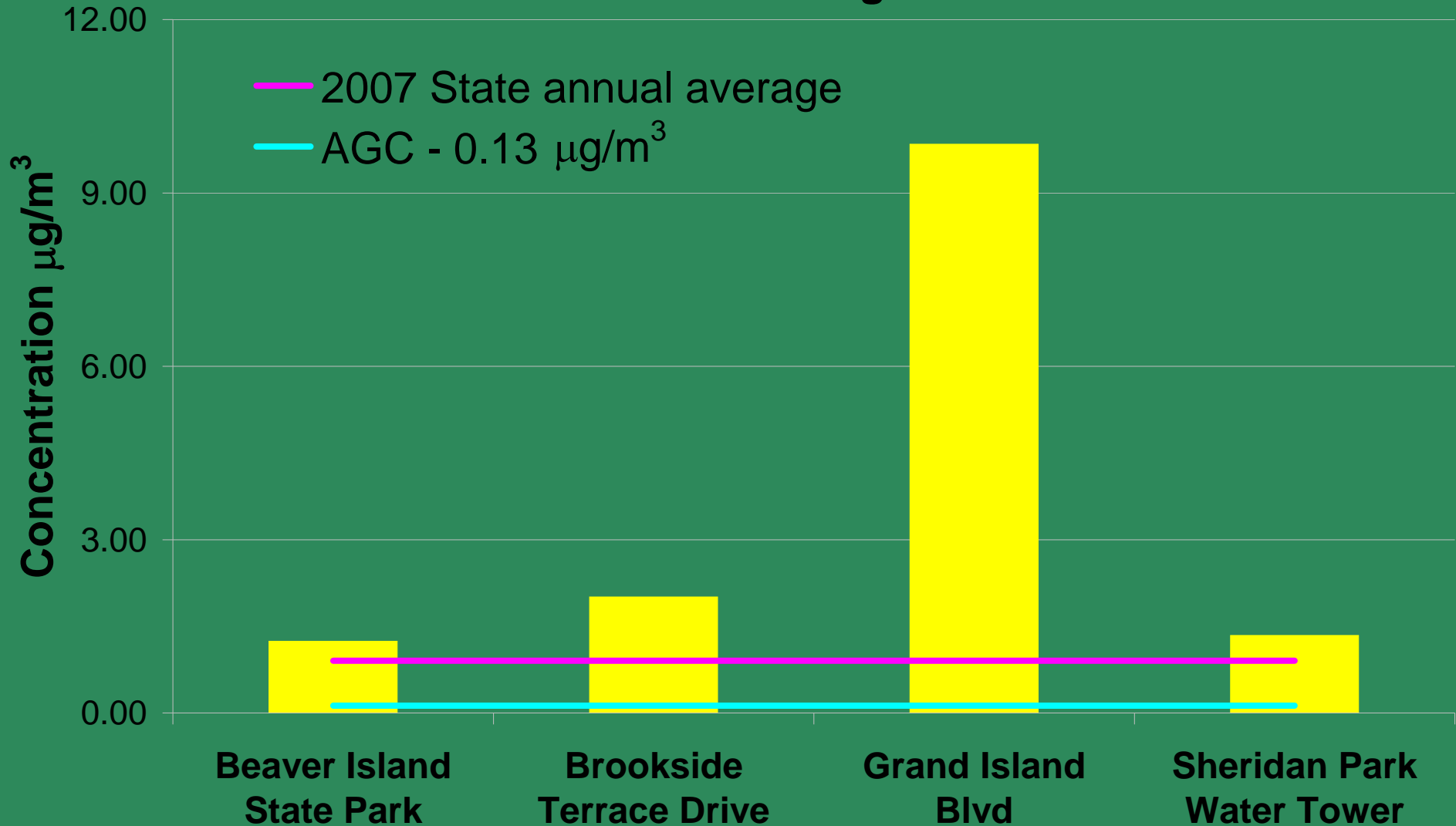
Benzene Sources in Tonawanda

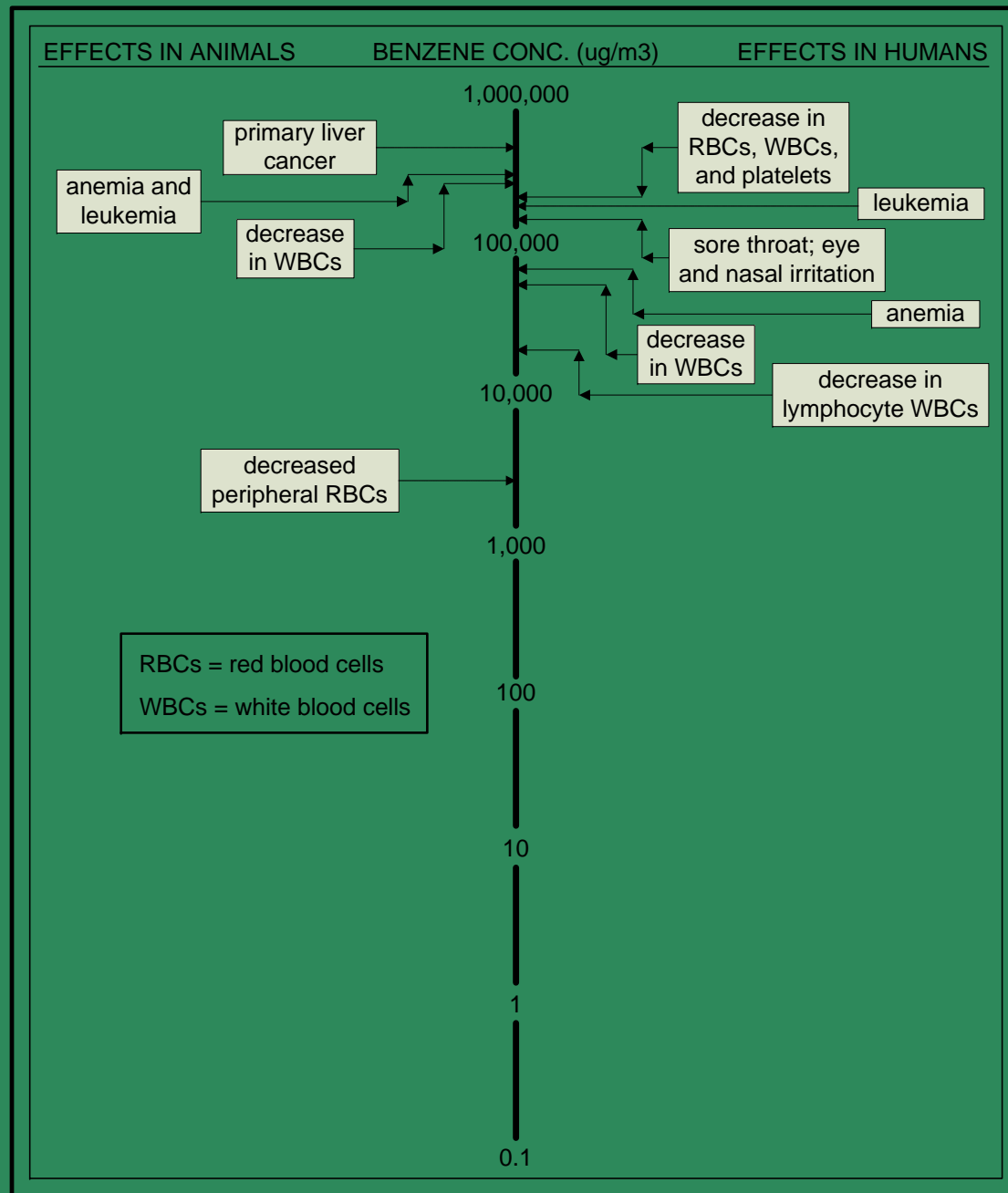
- Point Sources
 - Indeck Yerkes Energy Services
 - Goodyear Dunlop Tires
 - NOCO Energy Corp.
 - NRG Huntley Electric Generating
 - Sunoco Tonawanda Terminal
 - Tonawanda Coke Corp.
- Area Sources
 - Gasoline stations, truck terminals
 - Commercial and Industrial Boilers
- Mobile Sources
 - Car and truck exhaust/evaporative

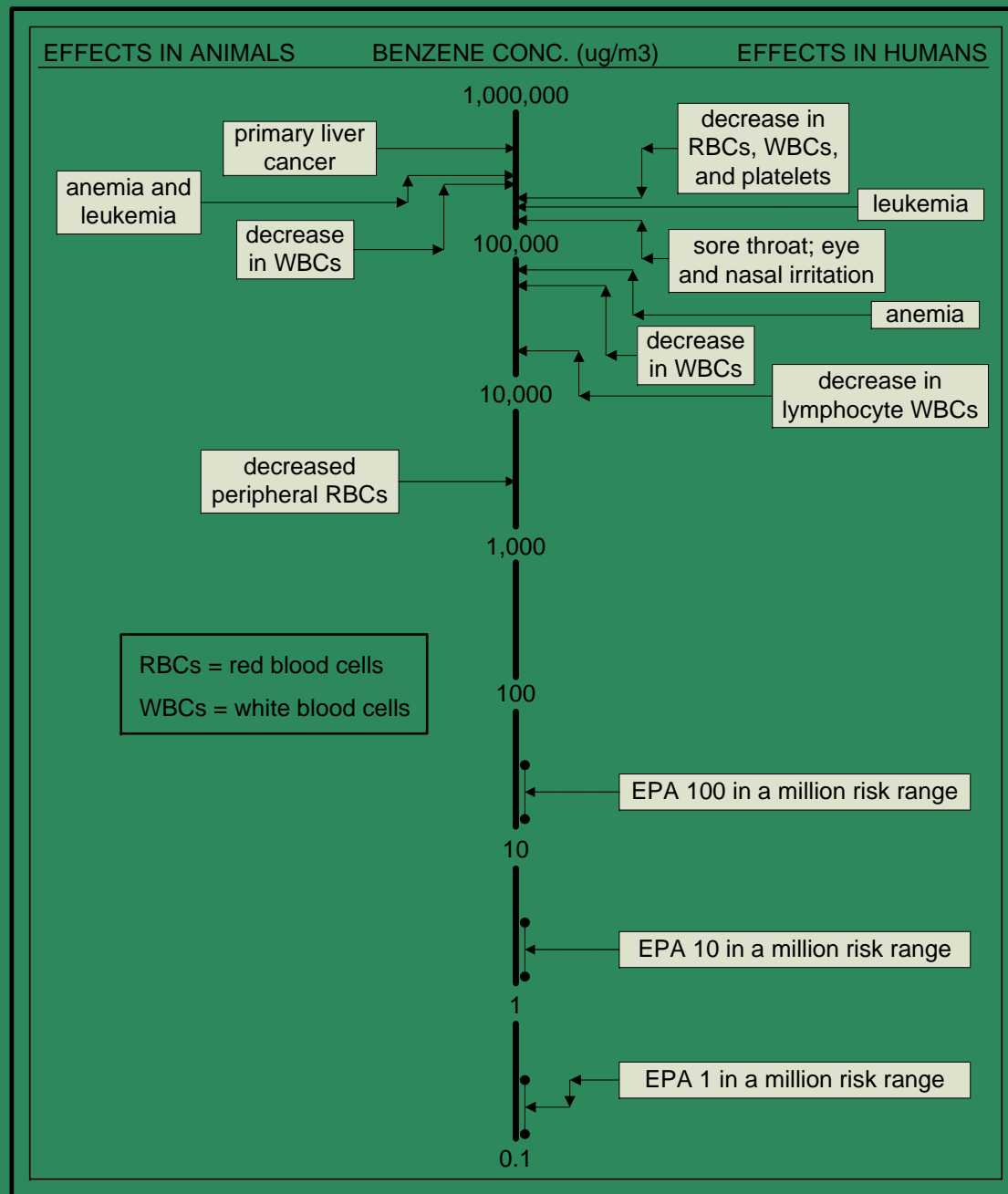


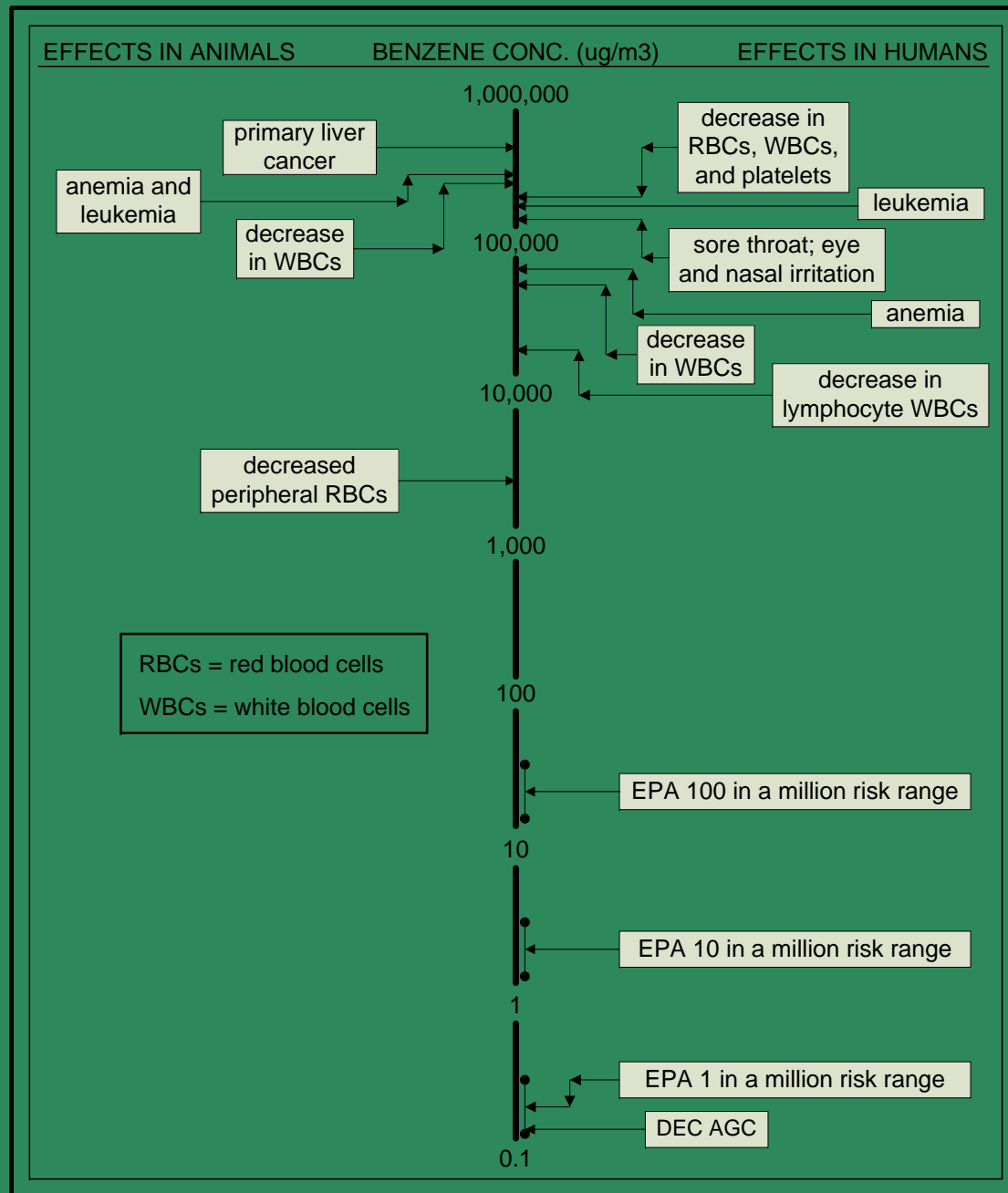
Benzene

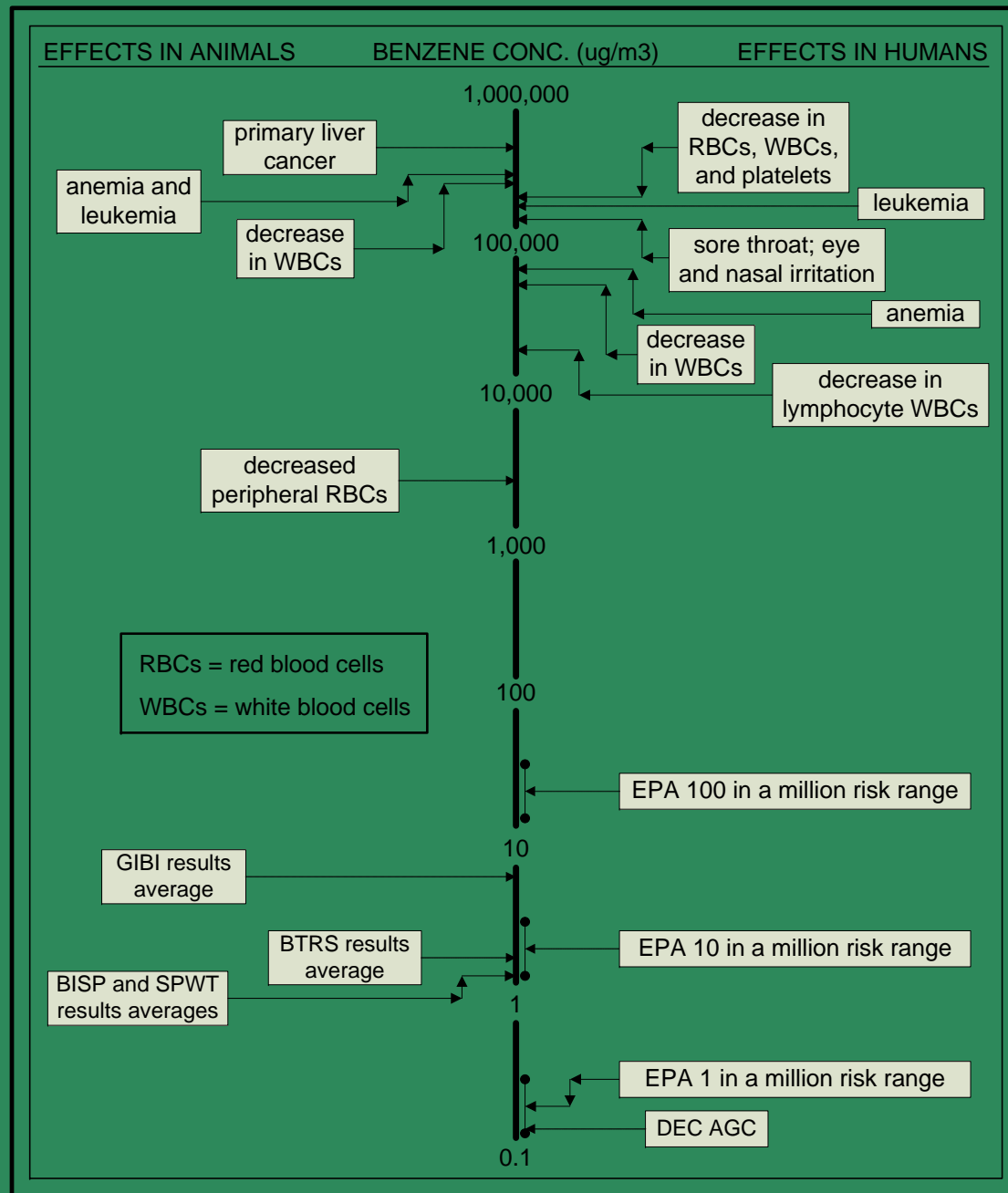
12 month average



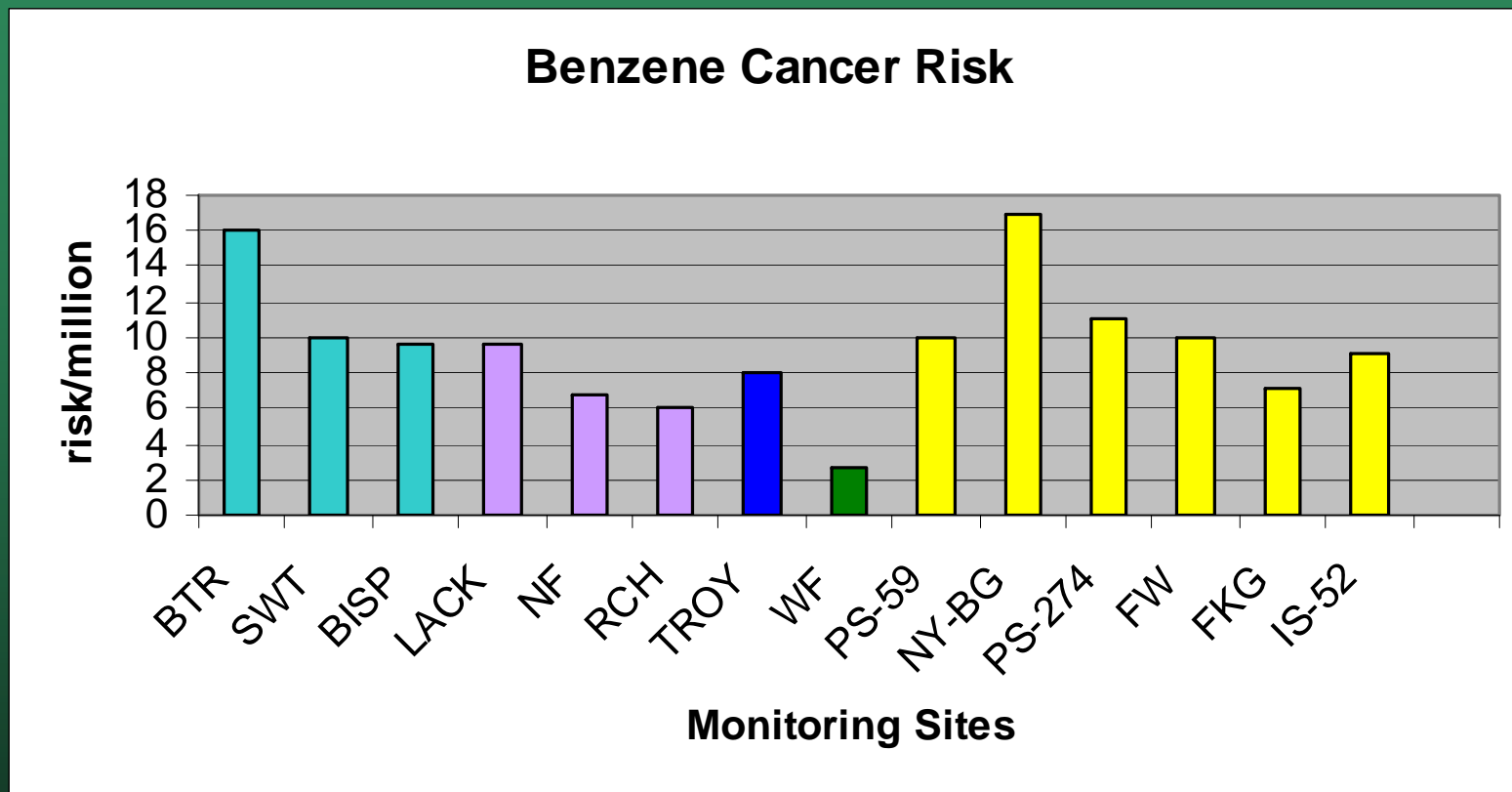








NYS Benzene Monitoring Data 2005-2007



Acrolein

- **Manmade sources**
 - Tobacco smoke
 - Chemical manufacturing (acrylic acid)
 - Combustion of petrochemical fuels and coal
 - Mobile source exhaust (cars, trucks, airplanes)
 - Formed when cooking fats are overheated
 - Breakdown by sunlight of various hydrocarbon pollutants (such as 1,3-butadiene)
 - Used as an herbicide and algicide
- **Natural sources**
 - Product of fermentation and ripening processes
 - Released when organic matter such as trees and other plants, including tobacco, are burned



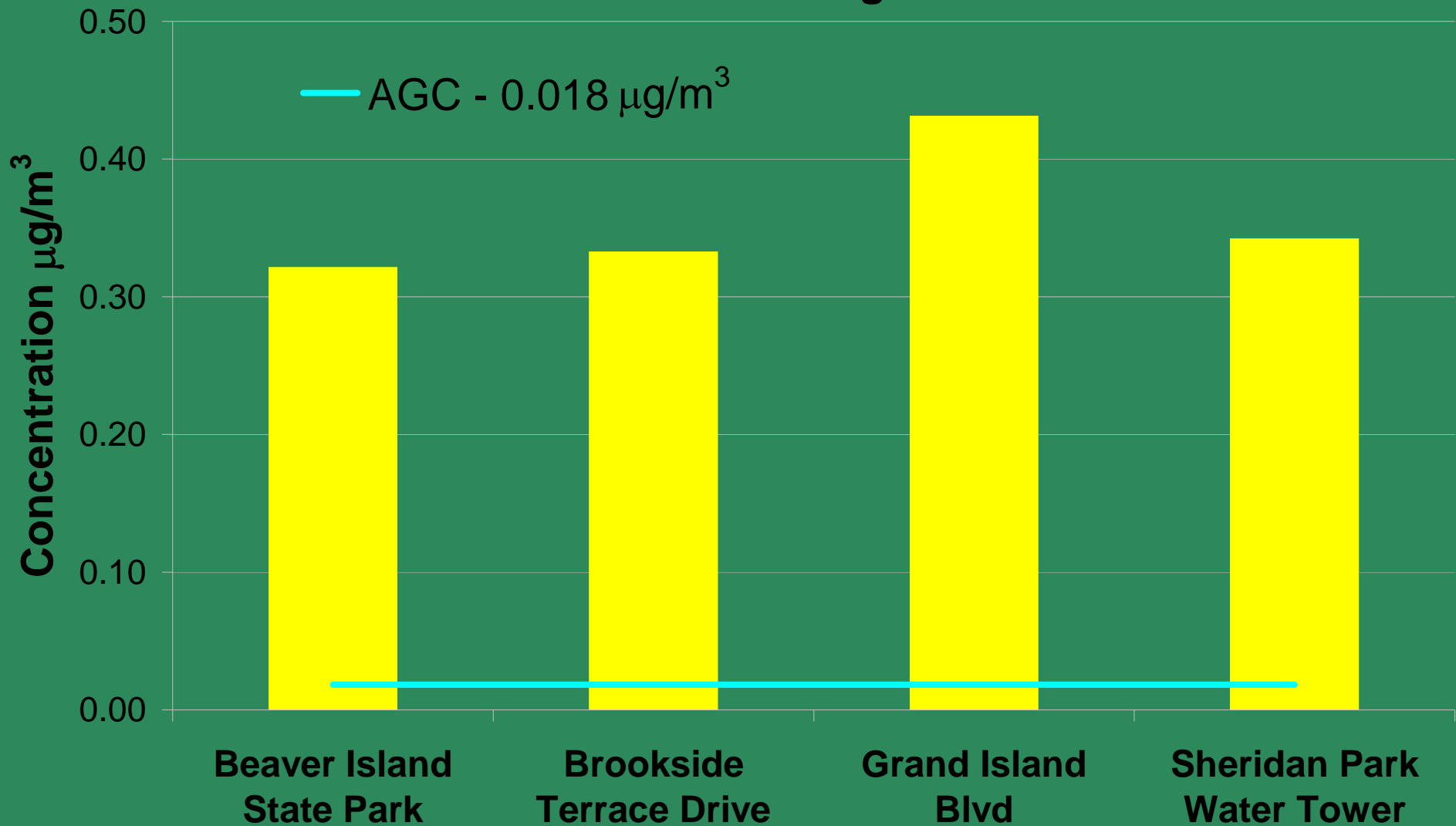
Acrolein Sources in Tonawanda

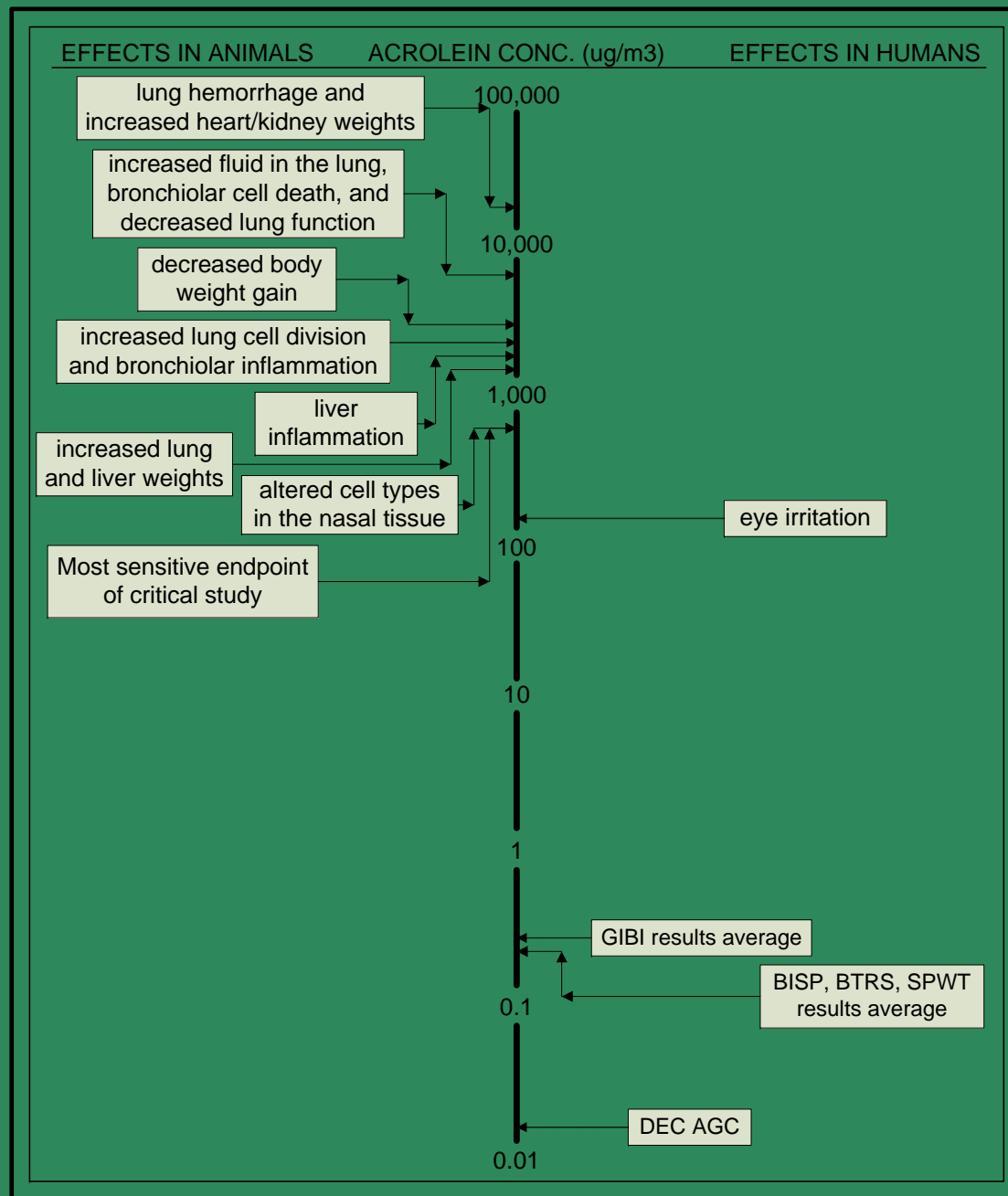
- Point Sources
 - 3M Tonawanda
 - Indeck Yerkes Energy Services
 - NRG Huntley Electric Generating
 - Tonawanda Coke Corp.
- Area Sources
 - Commercial and Industrial Boilers
- Mobile Sources
 - Car and truck exhaust



Acrolein

12 month average





Formaldehyde

- Manmade Sources
 - Predominantly used as a chemical intermediate
 - Manufacturing of urea-formaldehyde resins, used in particleboard products
 - Combustion sources, smoking
 - Mobile exhaust emissions
 - Breakdown of other compounds
- Natural Sources
 - Wildfires, animal wastes, plant volatiles



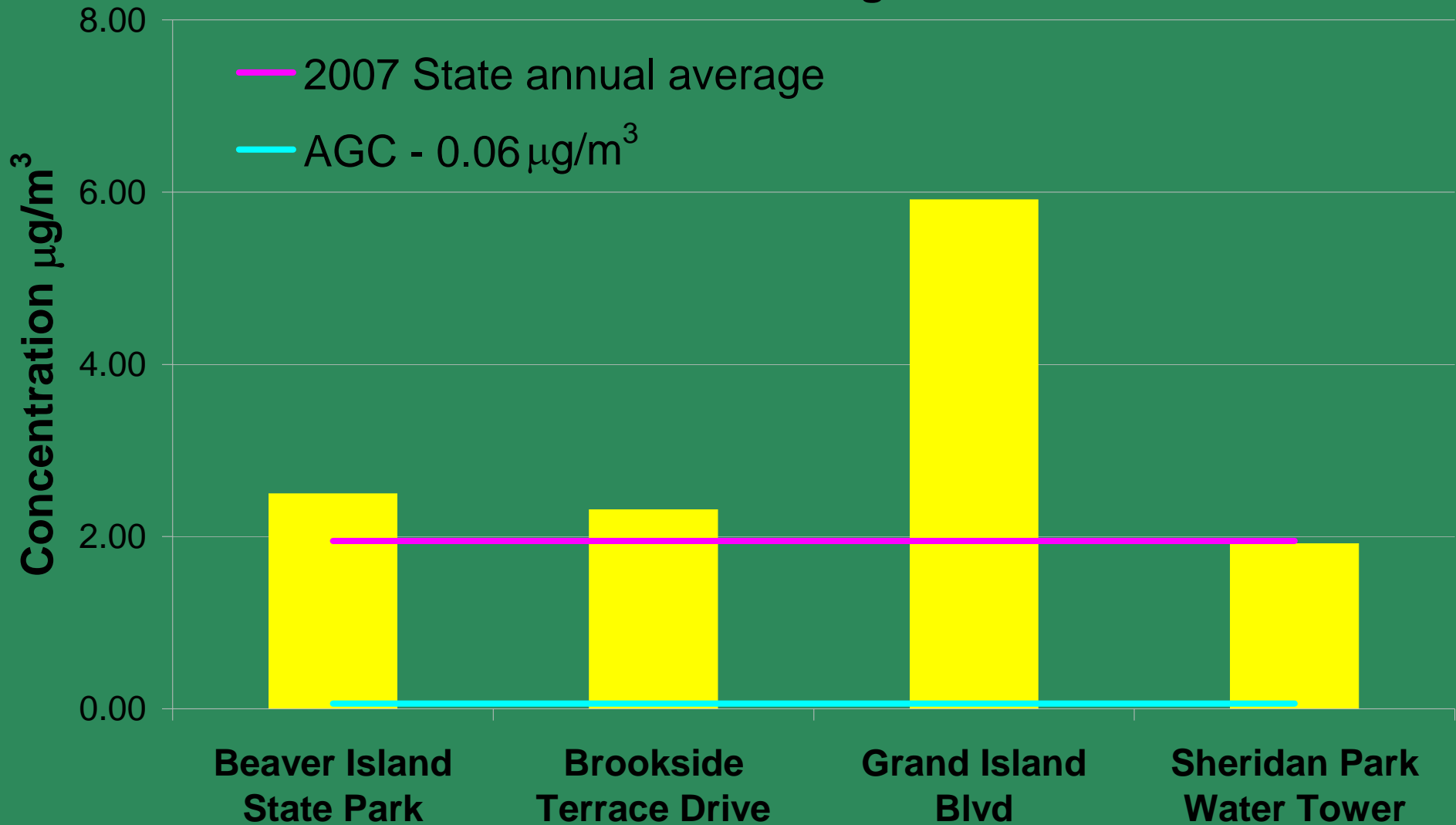
Formaldehyde Sources in Tonawanda

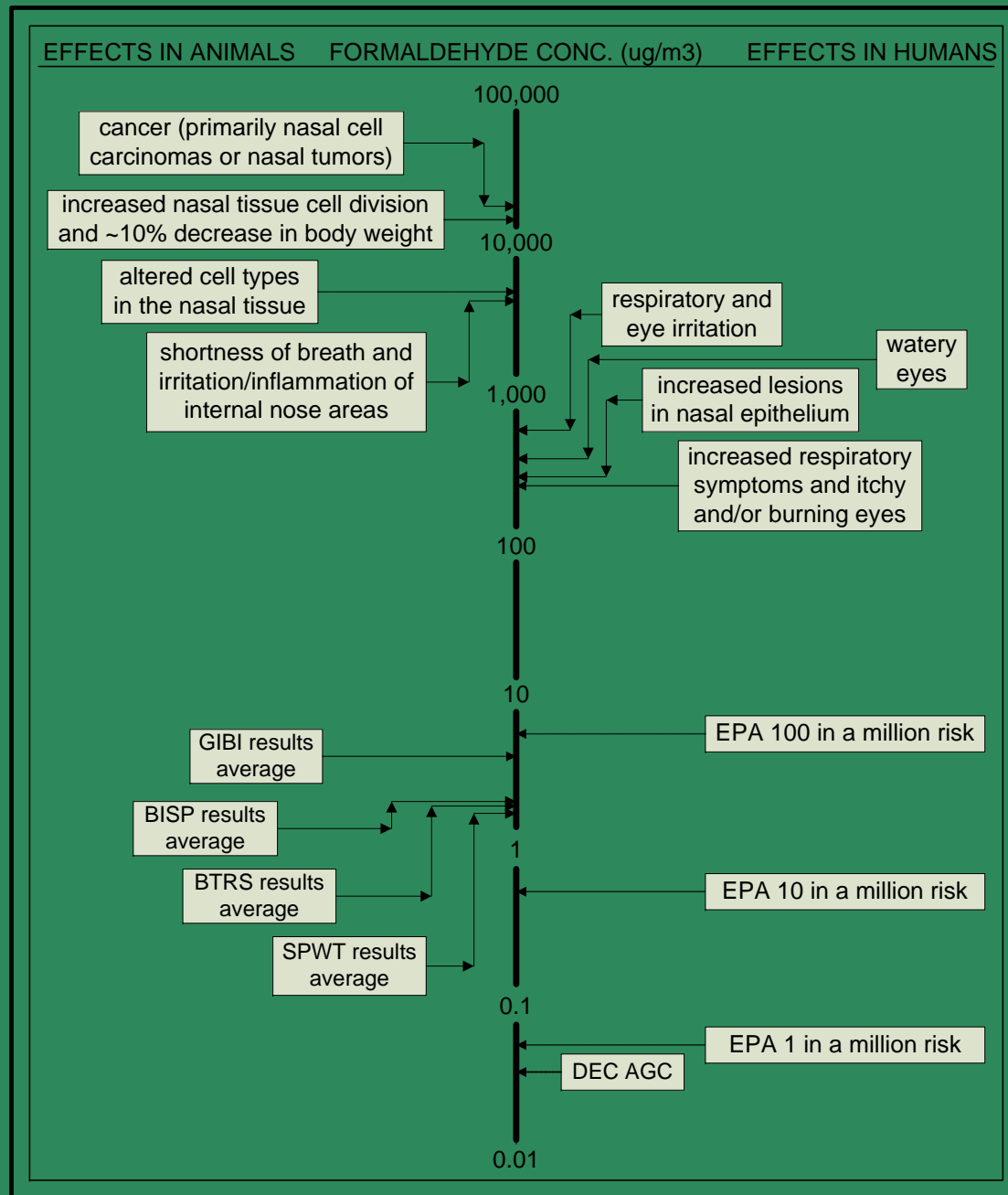
- Point Sources
 - Indeck Yerkes Energy Services
 - NRG Huntley Electric Generating
 - Tonawanda Coke
- Area Sources
 - Industrial Boilers
 - 3M Tonawanda
 - FMC Corp.
 - Goodyear Dunlop Tires
- Mobile Sources
 - Car and truck exhaust



Formaldehyde

12 month average





Acetaldehyde

- Manmade
 - intermediate in the synthesis of other chemicals, perfumes, polyester resins, and basic dyes.
 - solvent in the rubber, tanning, and paper industries
 - product of incomplete combustion
- Natural Sources
 - Wildfires



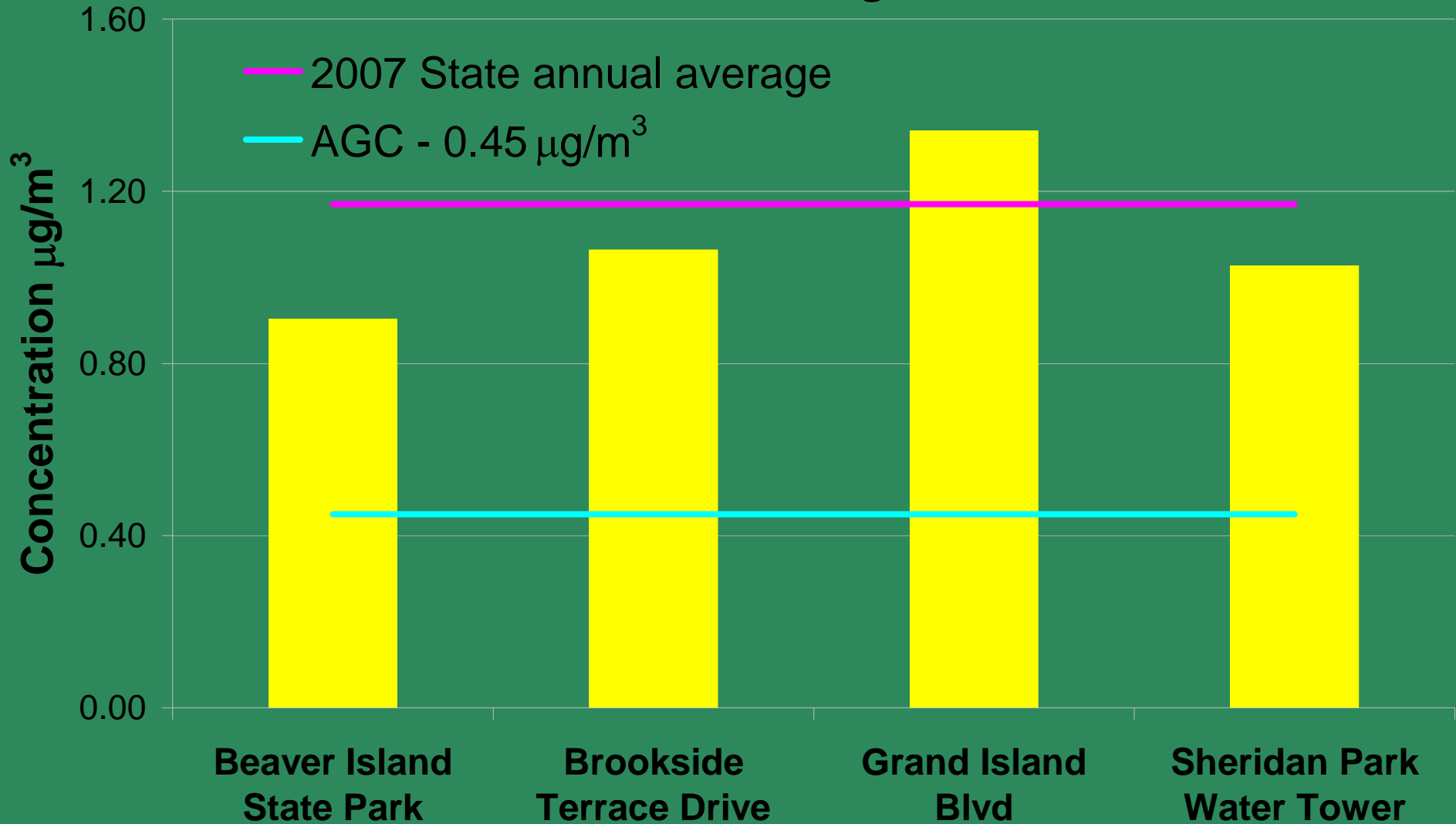
Acetaldehyde Sources in Tonawanda

- Point Sources
 - 3M Tonawanda
 - Goodyear Dunlop
 - Indeck Yerkes Energy Services
- Area Sources
 - Commercial and Industrial Boilers
- Mobile Sources
 - Car and truck exhaust



Acetaldehyde

12 month average



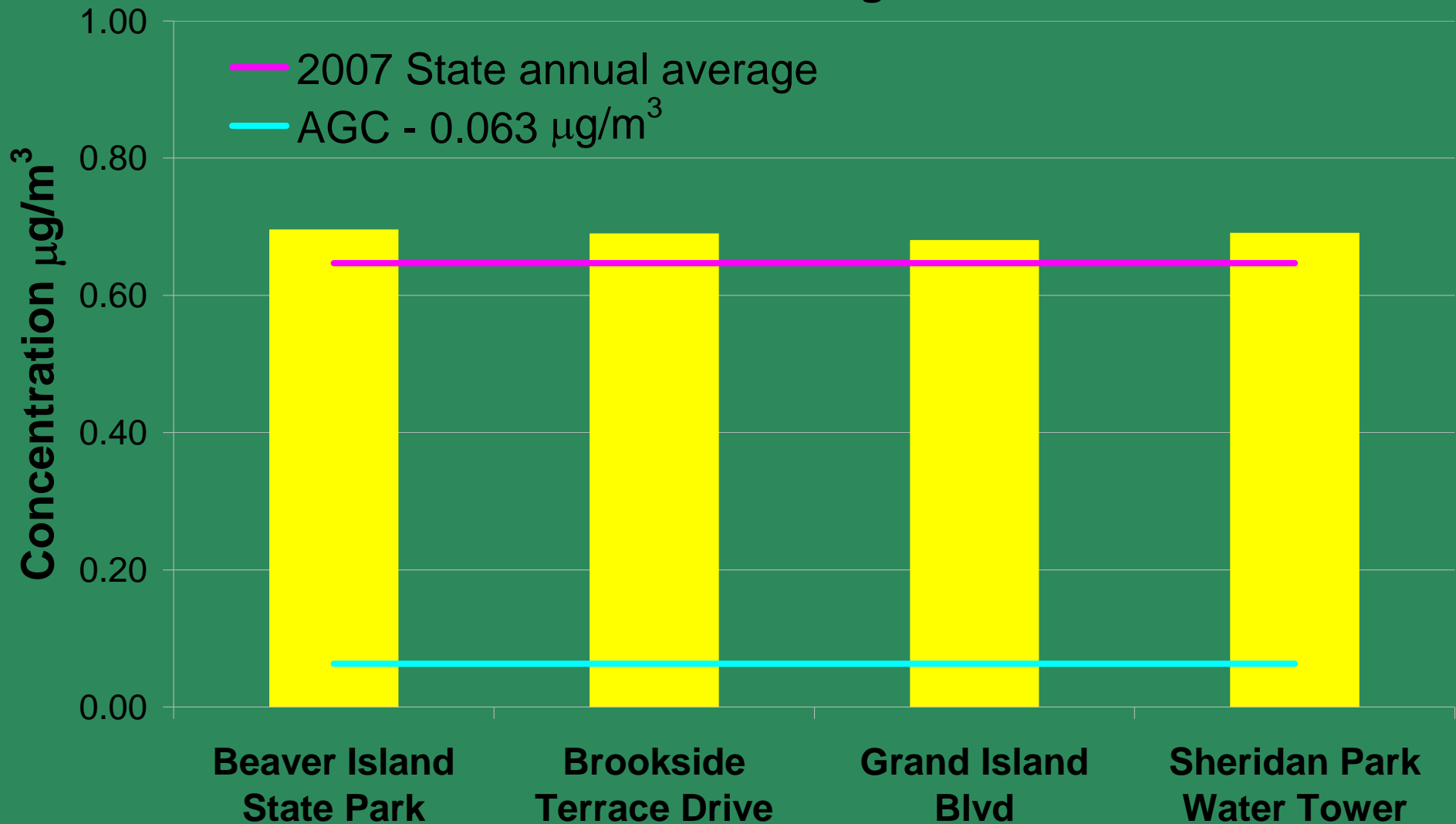
Carbon tetrachloride

- Manmade sources
 - Manufacturing agent for refrigerants and propellants for aerosol cans
 - Solvent for oils, fats, lacquers, varnishes, and resins
 - Grain fumigant
 - Dry cleaning agent
 - Consumer and fumigant uses have been discontinued
 - Production and consumption phased out in U.S in 1999
- Natural Sources
 - No natural sources



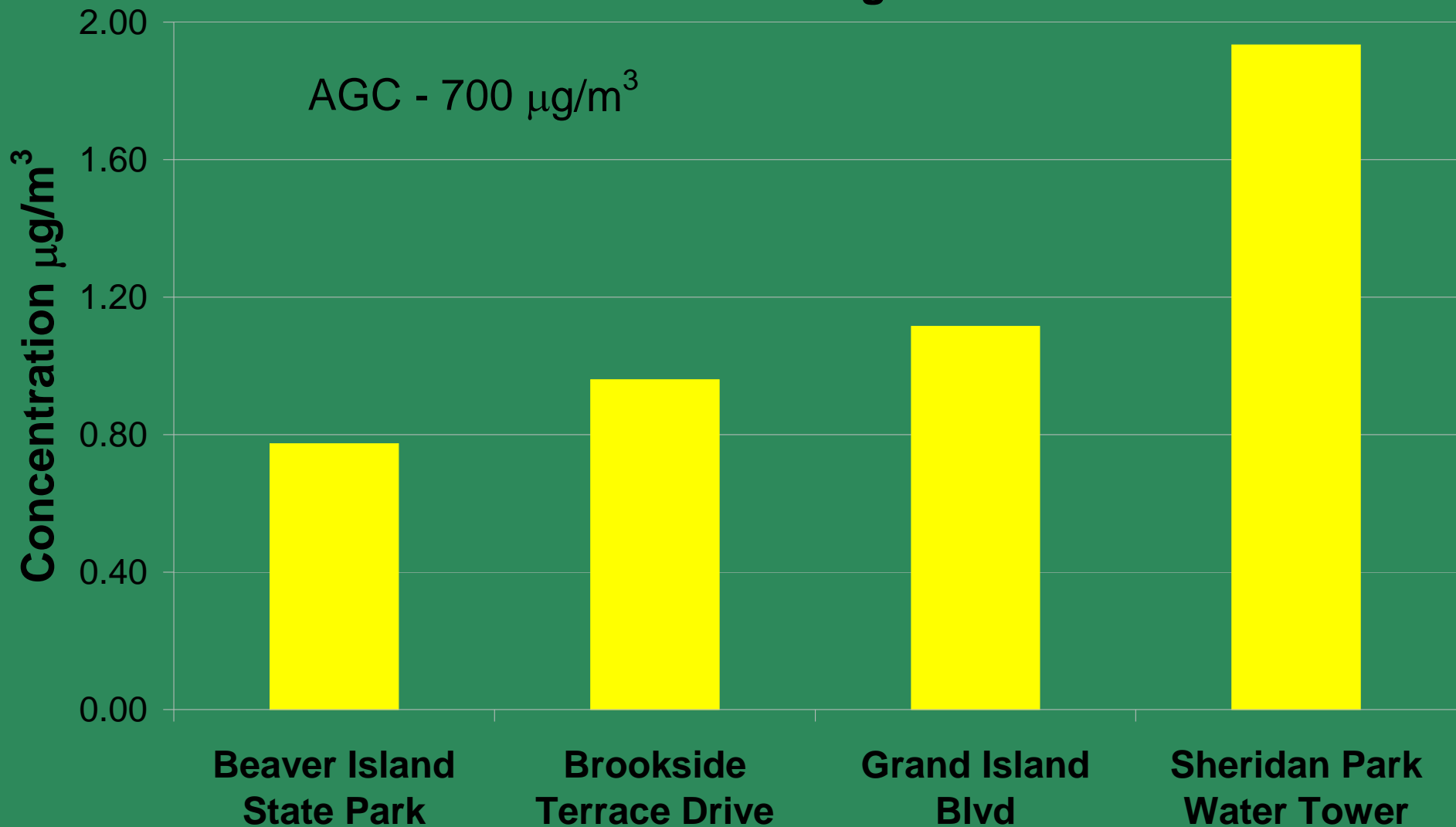
Carbon tetrachloride

12 month average



Carbon disulfide

12 month average

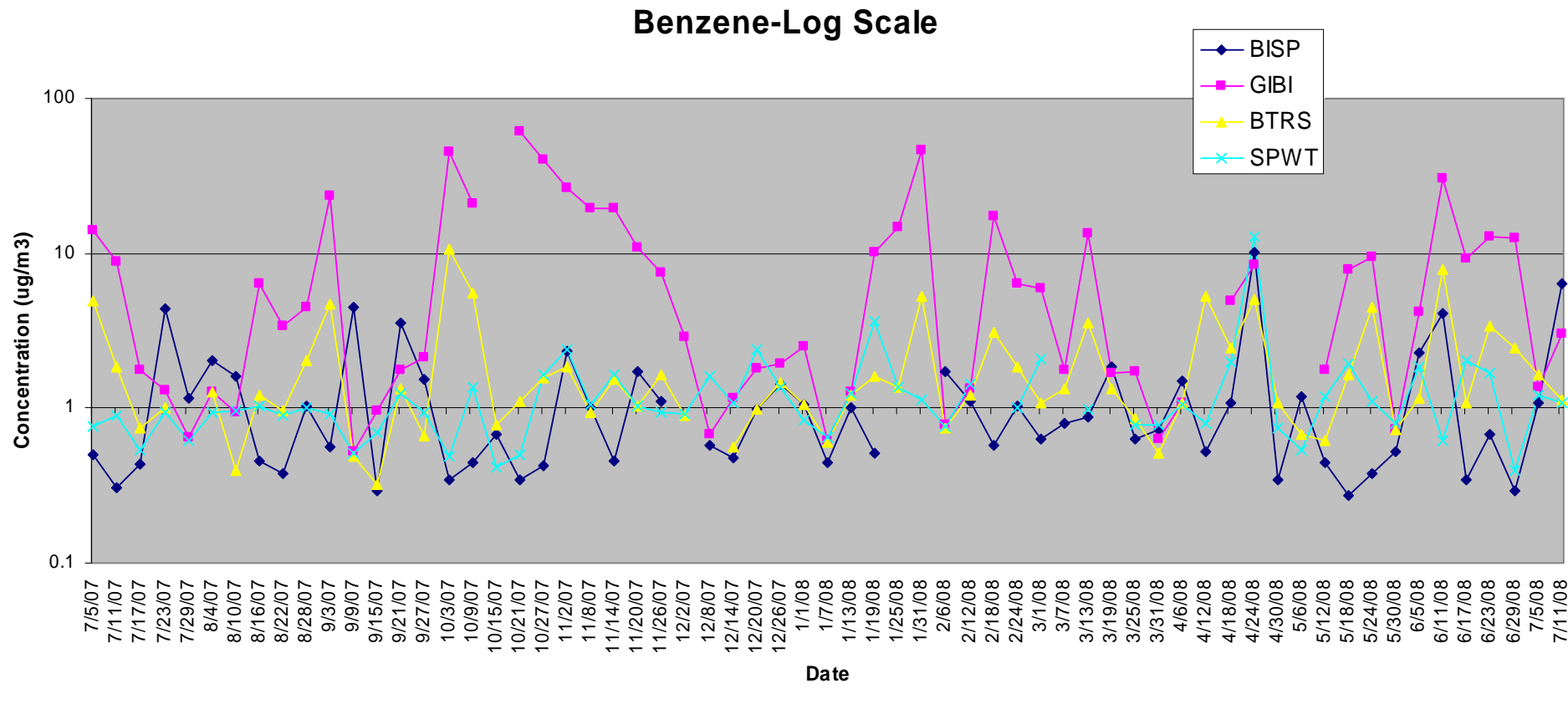


Next Steps

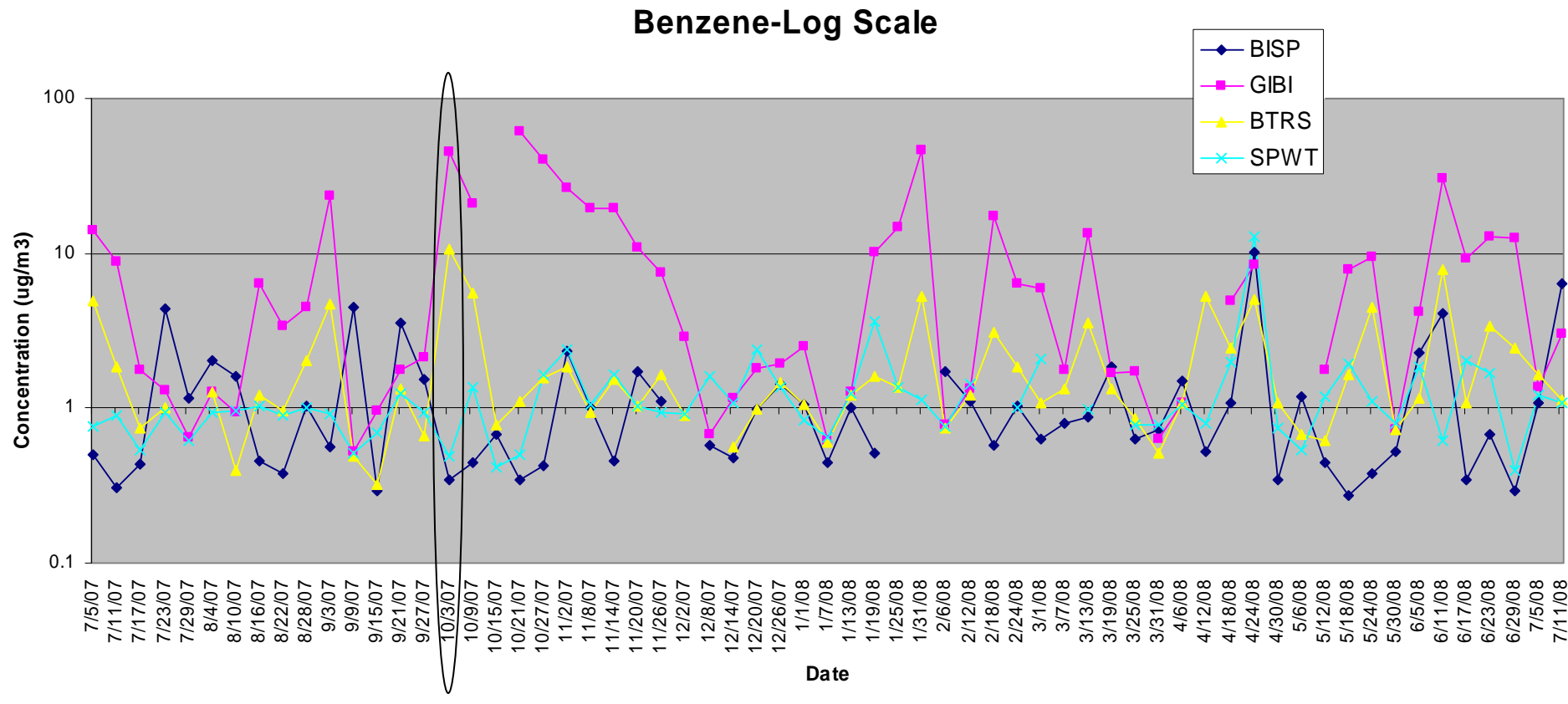
- Analyze pollutant specific data
 - Evaluate influence of wind direction on monitored concentrations
 - Continue risk characterization process
 - Assess emissions and potential contribution from industrial and mobile sources



Next Steps



Next Steps



Next Steps

October 3, 2007

Benzene Conc.

Beaver Island SP

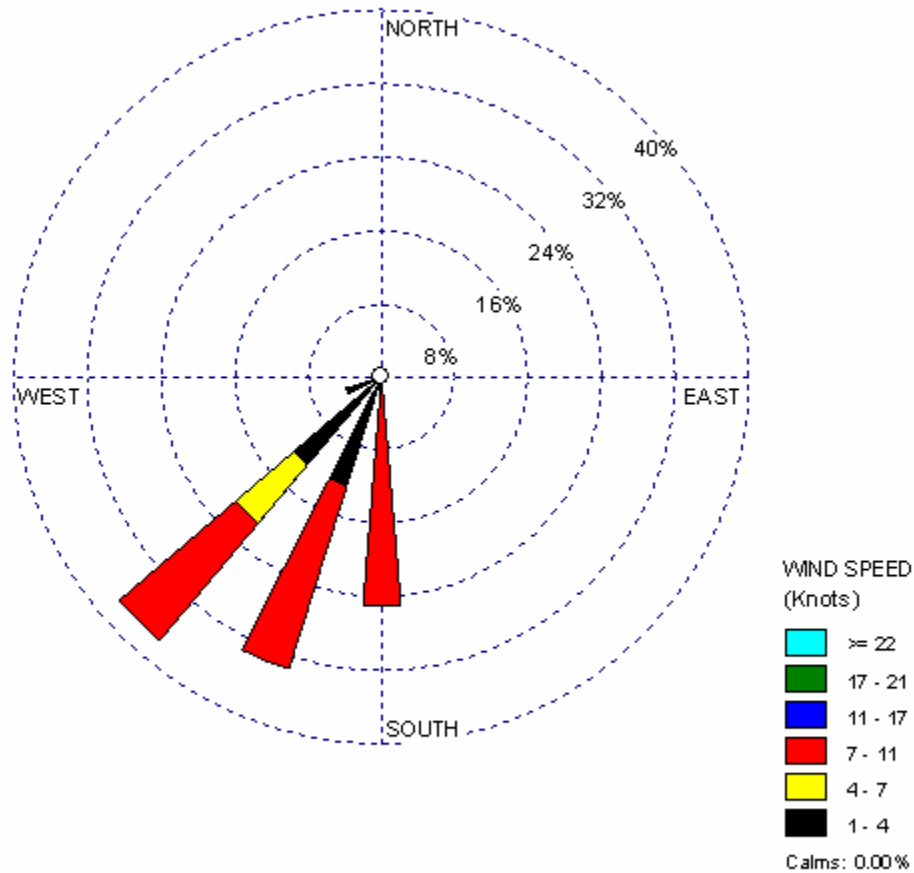
0.56 ug/m3

Grand Island Blvd

45 ug/m3

Brookside Terrace

10 ug/m3

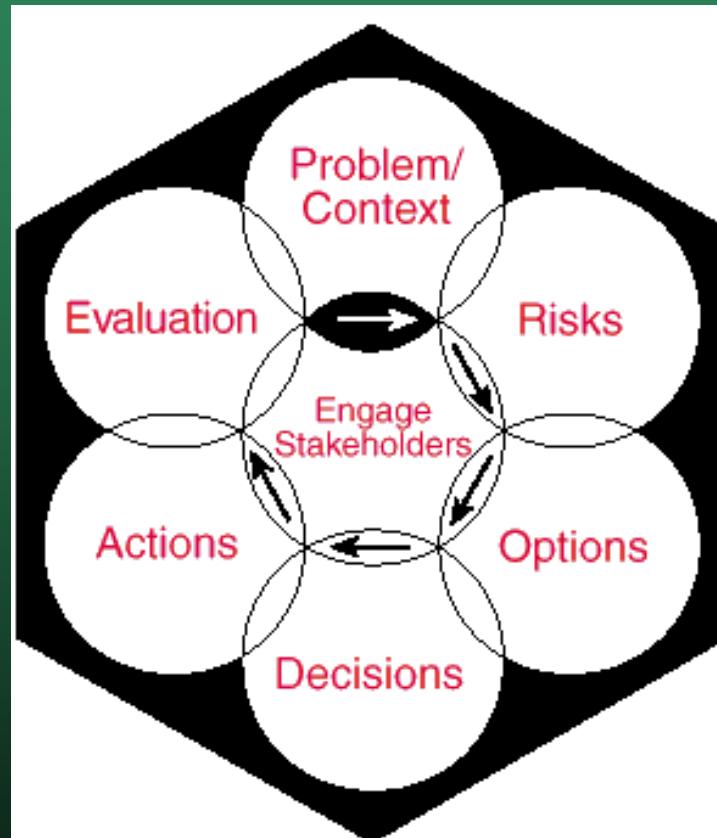


Commitment to the Public

- Keep public informed by holding public meetings to discuss project and results
- Continue to work on air pollution reduction strategies
- Collaborate with the Clean Air Coalition of Western N.Y.



Framework for Risk Management



Thank You (for Monitoring Startup)

- National Grid Real Property
 - Mark Agle, Supervisor Real Property Section
- Town of Tonawanda Water Resources Dept.
 - John Camilleri, Director
- Beaver Island State Park
 - William Huntoon, Park Manager
 - John McGinty, Maintenance Crew Chief
- NYSDEC Region 9 Operations
 - Larry Middaugh, Reinstein Woods Crew Chief



Questions



Contact

- Questions about facilities and emissions
 - Larry Sitzman (716) 851-7130
- Questions about Tonawanda study
 - Tom Gentile (518) 402-8402
 - Paul Sierzenga (518) 402-8508

