

Susquehanna River Basin Early Warning System

Background, Overview, and Expansion of the System



Lower Susquehanna Source Water Protection Meeting
Building a Regional Partnership
February 9th, 2012

The Basin

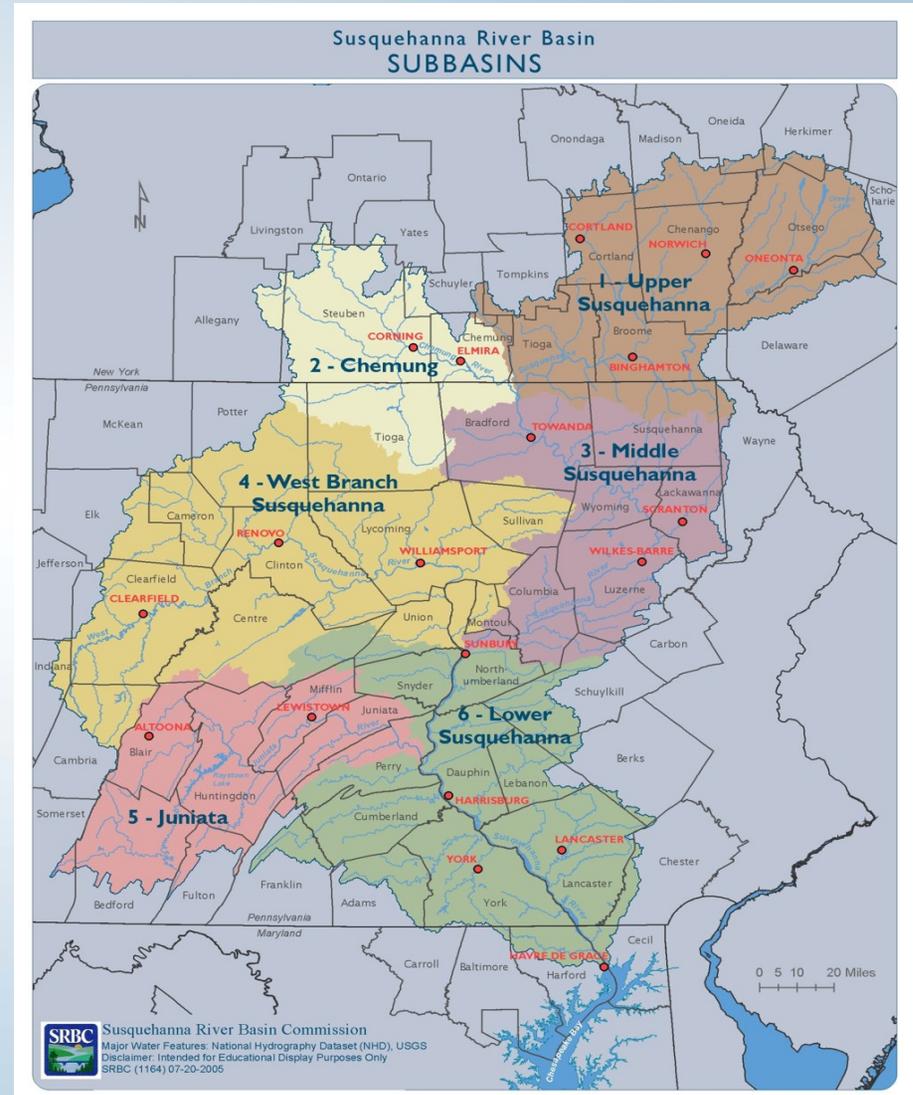
- 27,510-square-mile watershed
- Comprises 43% of the Chesapeake Bay watershed
- 4.2 million population
- 60% forested
- 32,000+ miles of waterways

The Susquehanna River

- 444 miles, largest tributary to the Chesapeake Bay
- Supplies 18 million gallons a minute to the bay

The Commission

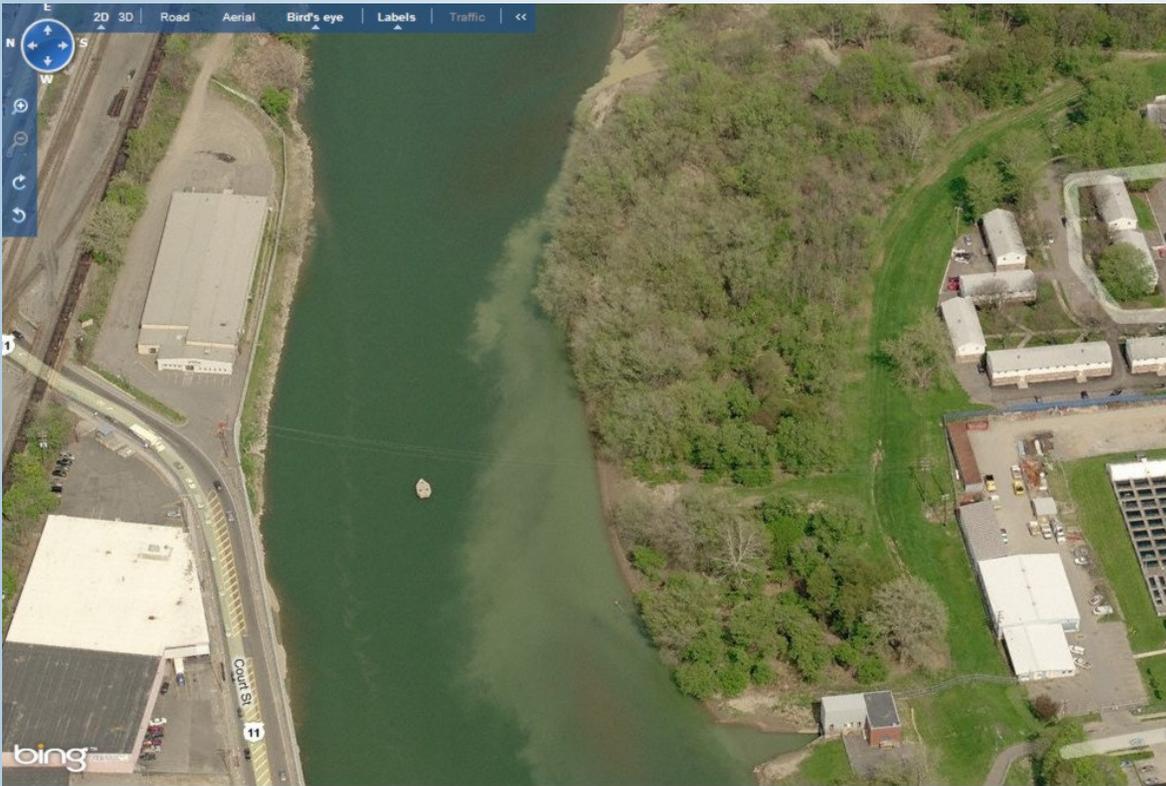
- Enhance public welfare through comprehensive planning, water supply allocation, and management of the water resources of the Susquehanna River Basin.



Early Warning System (EWS) Concept

- Provide warning of adverse water quality conditions prior to withdrawal and treatment for the purpose of drinking water protection
 - Detection, identification, response, and notification
- Possible to have different levels of operation
- Susquehanna System explored options for full functionality – but focused on source water monitoring

Benefits of an EWS



- Protect human health
- Assist with treatment strategy
- Assist with ensuring compliance with regulations

Background

- In 2000, SRBC contracted by PADEP and MDE to assess over 60 surface water sources in the lower Susquehanna River Basin, in both Pennsylvania and Maryland
 - Combined, the drinking water sources serve most of the population in the lower Susquehanna River Basin
- In 2002, started development of an Early Warning System for the Susquehanna River in Pennsylvania
 - Pennsylvania provided start-up funding
 - SRBC serving as the coordinating agency, continued O&M funding
 - Stakeholder group -- water suppliers, the emergency response community, and select government agencies (environmental protection, health, etc)

Background

- Over 20 drinking water intakes on the main stems of the Susquehanna River
 - Over 800,000 people depend on the river within the reaches covered by monitoring systems
 - Additional 1.9 million + downstream in Maryland (includes Baltimore diversion)
- Participation from 11 major water suppliers on the Susquehanna River in Pennsylvania
- 9 actively engaged in activities and committed through formal participation letters
- Interest from Maryland water suppliers

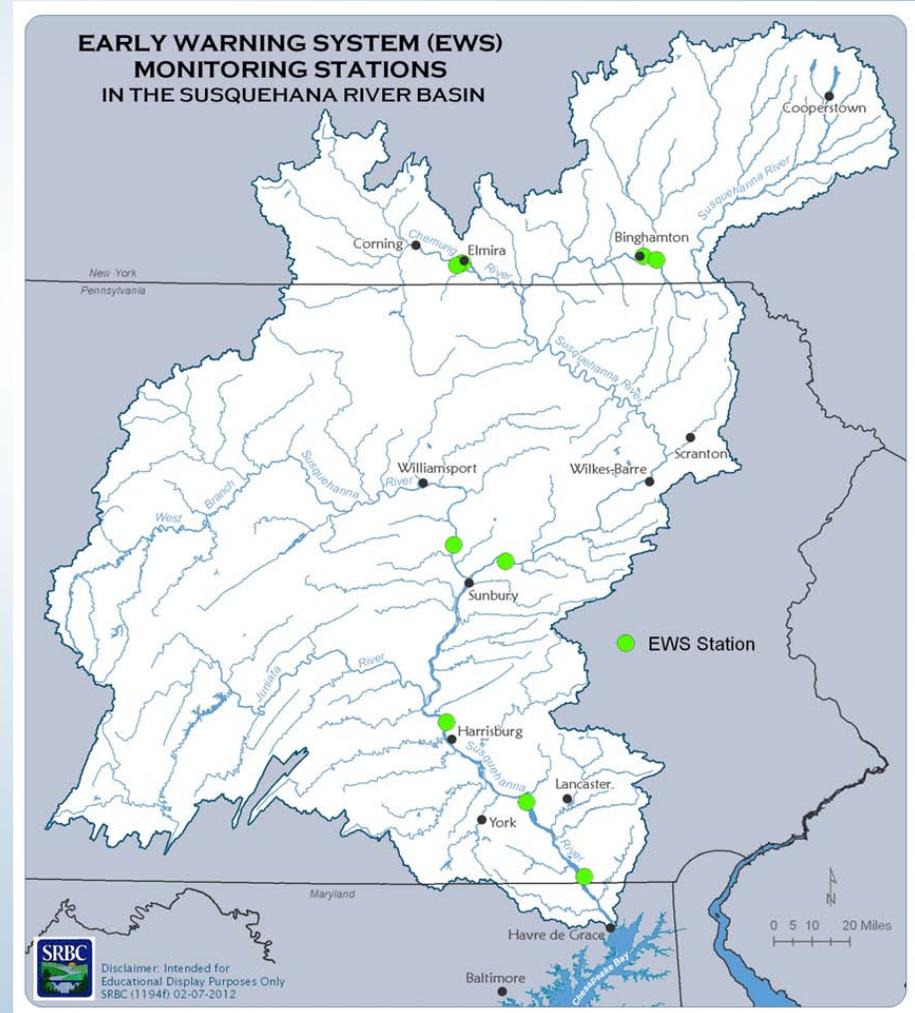
Susquehanna Basin Early Warning System

Enhancing Protection of Pennsylvania and New York Public Water Supplies

- Coordinate project activities
- Maintain project database
- Maintain monitoring network
- Maintain communication network
- Provide continuing technical support for system enhancements

Early Warning System (EWS)

- PA EWS program - 2003
- Enhancing drinking water protection efforts
- Turbidity, pH, and temperature @ intake locations with real-time data transmission
- Organic contaminant detection capabilities at select stations







New York EWS Expansion (2006-2009)

- Add monitoring equipment at the Elmira/Binghamton intakes
 - *Turbidity, pH, and temperature (standard system parameters)*
 - *Dissolved oxygen, conductance*
 - *Organics detection (TOC and UVAS monitors)*
- Install “stand-alone” remote monitoring stations upstream of the intakes
 - *Turbidity, pH, temperature, dissolved oxygen, conductance*
- Standardize EWS data transmission/management modules for ease of implementation at new stations

Susquehanna Basin Early Warning System Core Functions

- Coordinate project activities
- Maintain project database
 - *EWS station data, water supply info, withdrawals/discharges, interstate spill response directory*
- Maintain monitoring network
 - *Provide lead support for maintaining/enhancing capability*
- Maintain communication network
 - *Focused on data transmission and website*
- Provide continuing technical support for system enhancements
 - *River studies (both hydrology and water quality), potential analytical tool application to the basin (ICWater/Riverspill?), links to other interests (recreational, bacteria, fish kills), “new” monitoring equipment testing/upgrades (i.e. optical probes, UVAS), remote WQ station capability, upgrade database and website*

Web Site

Secure website

- User name and password protected
- SRBC will assign log-ins

Features

- Graphical data display
- Basic Statics
- Raw Data Tables
- Interactive Map
- Time of Travel Tool

Risk Assessment

Factors

Geology

Land Use

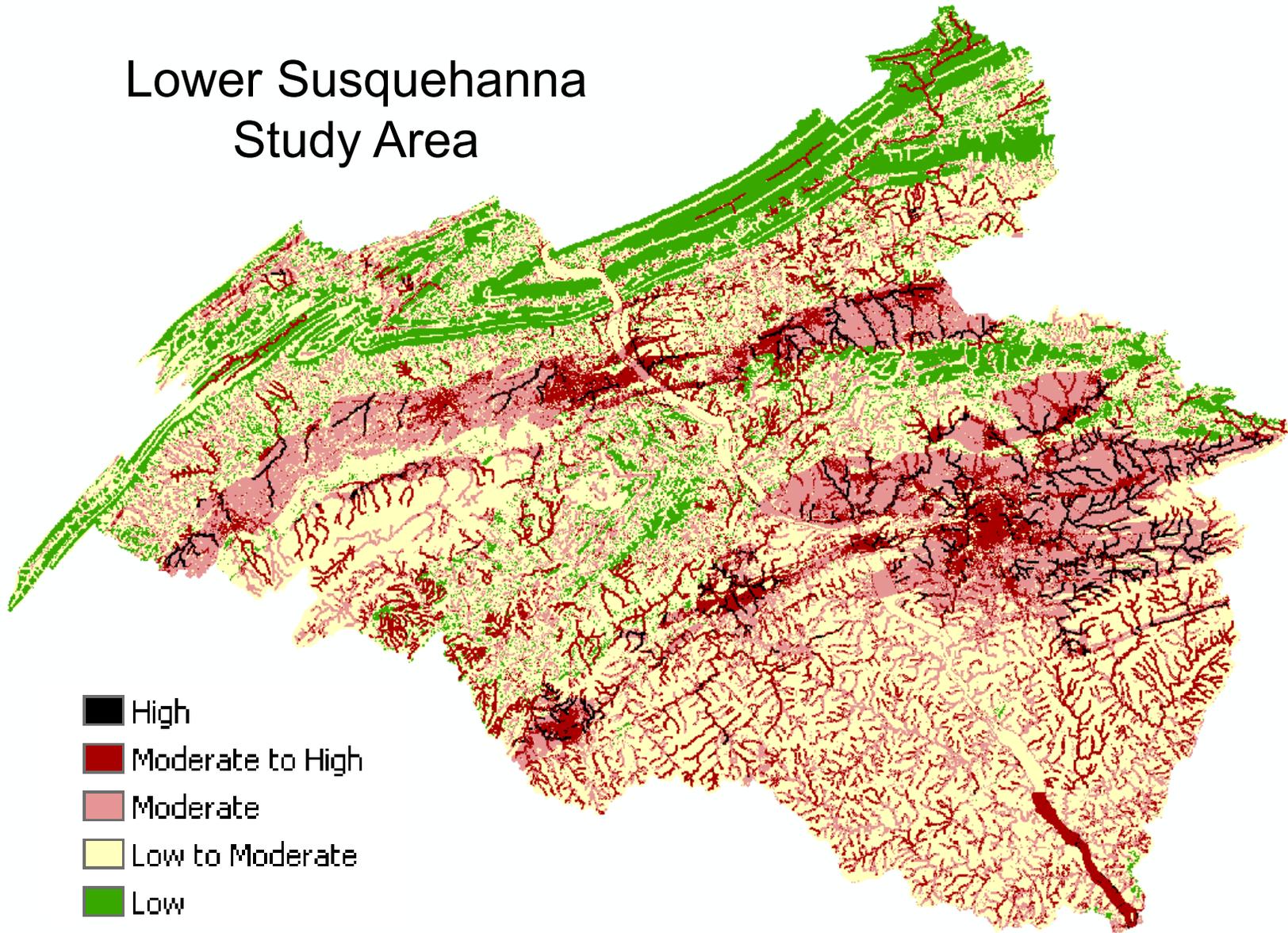
NPDES Locations

RCRA Locations

Waterways

Waterways with impairments

Lower Susquehanna Study Area

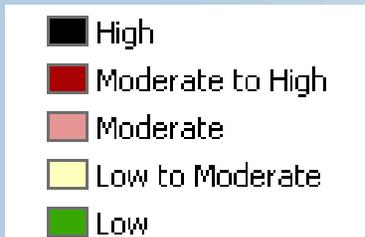
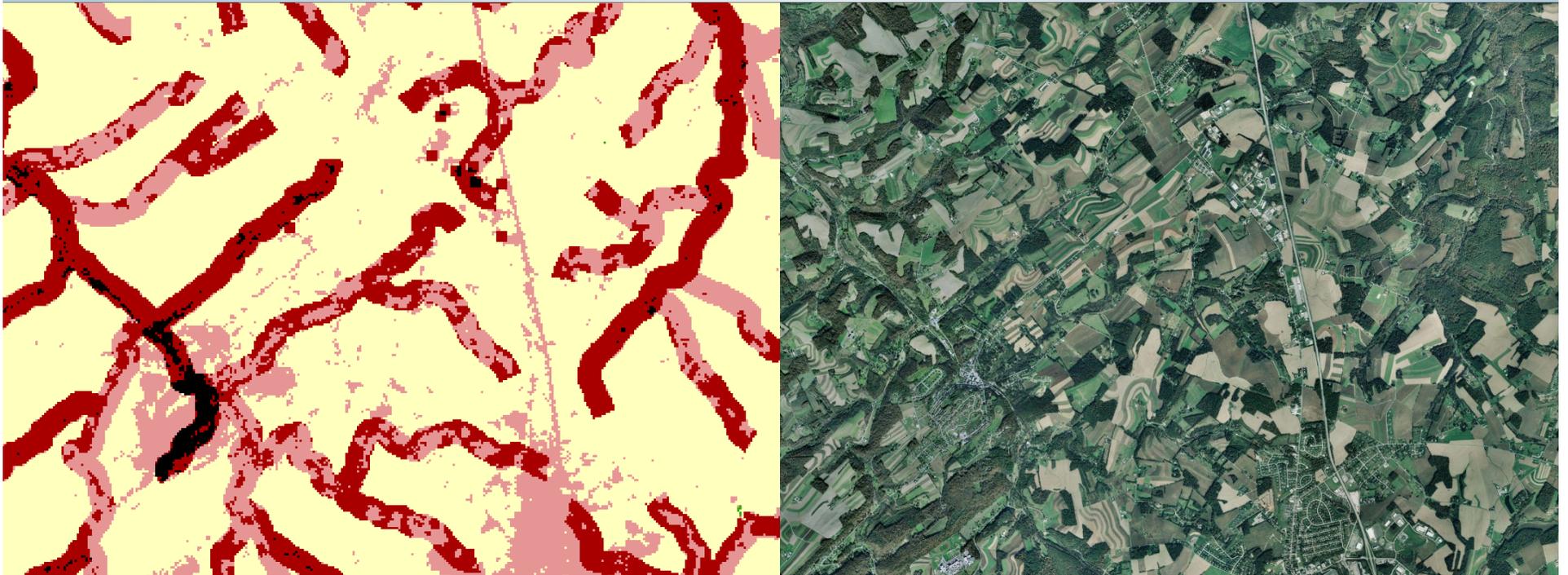


Lancaster Area

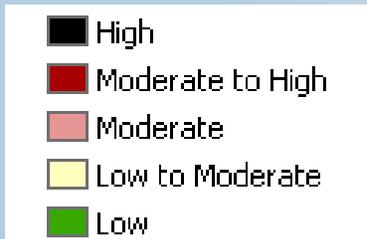


- High
- Moderate to High
- Moderate
- Low to Moderate
- Low

York County



Cumberland County



IC Waters

Incident Command waters

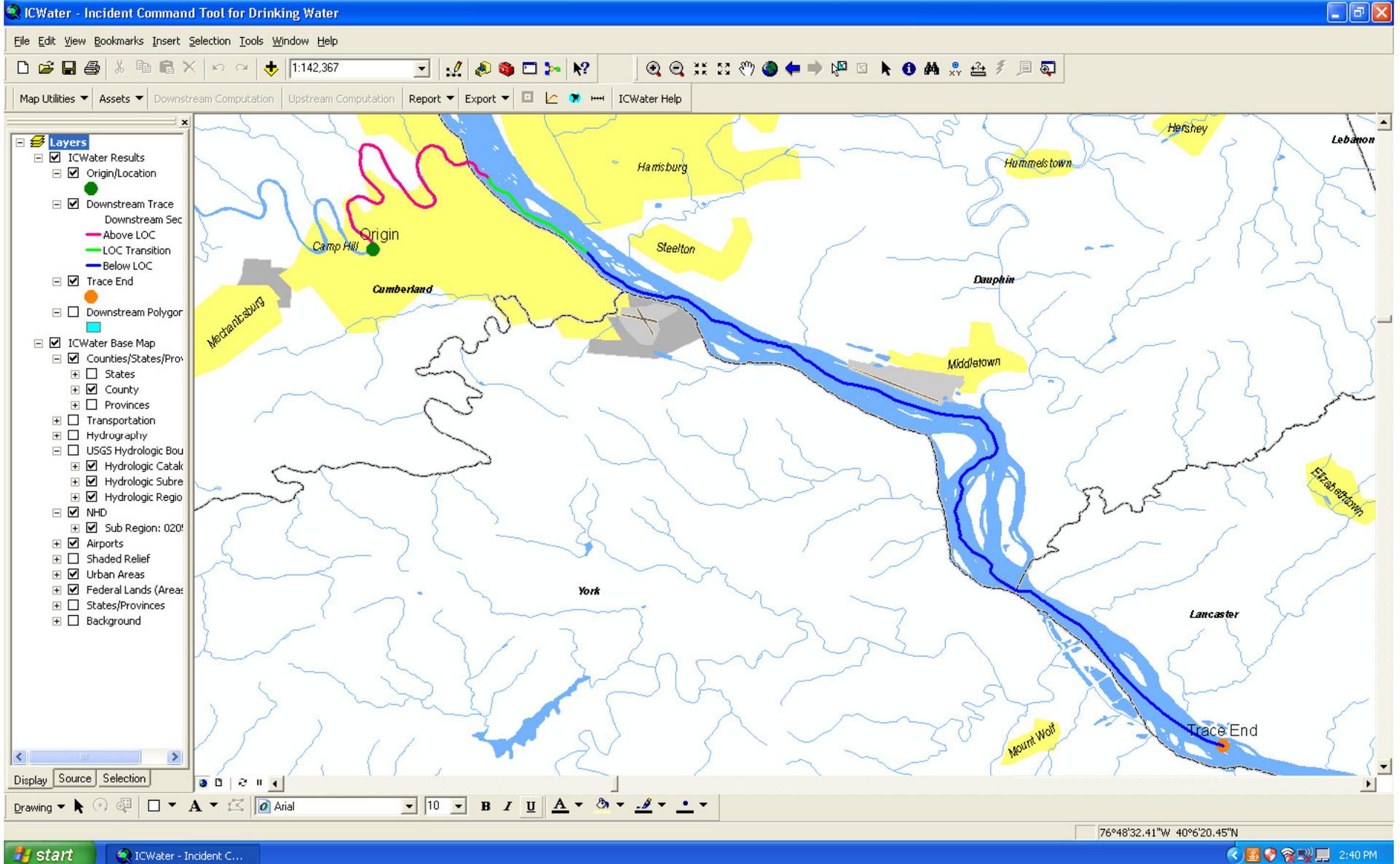
- AcrGIS modeling tool
- Designed to help water resource managers better manage spill events
- Varsity of tools
 - Maps
 - Graphs
 - Reports

IC Waters

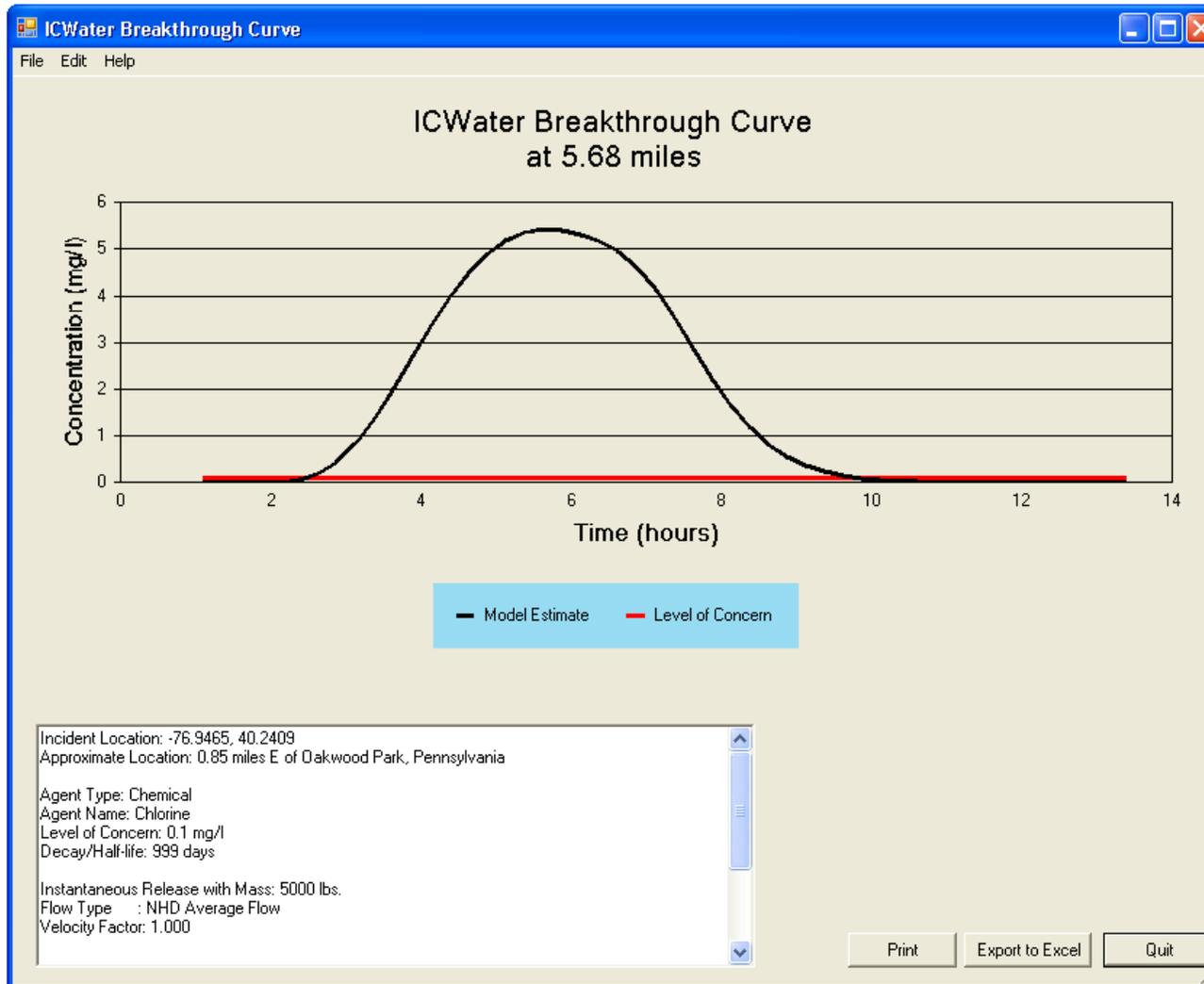
Downstream Computation

- Estimates TOT of the contaminant
- Estimates concentration of the contaminant over time
- Inputs
 - Contaminant
 - Type of spill (instantaneous or continuous)
 - Amount and concentration of the contaminant
 - Flow (NHD plus, USGS stream gage, user defined)

IC Waters



IC Waters

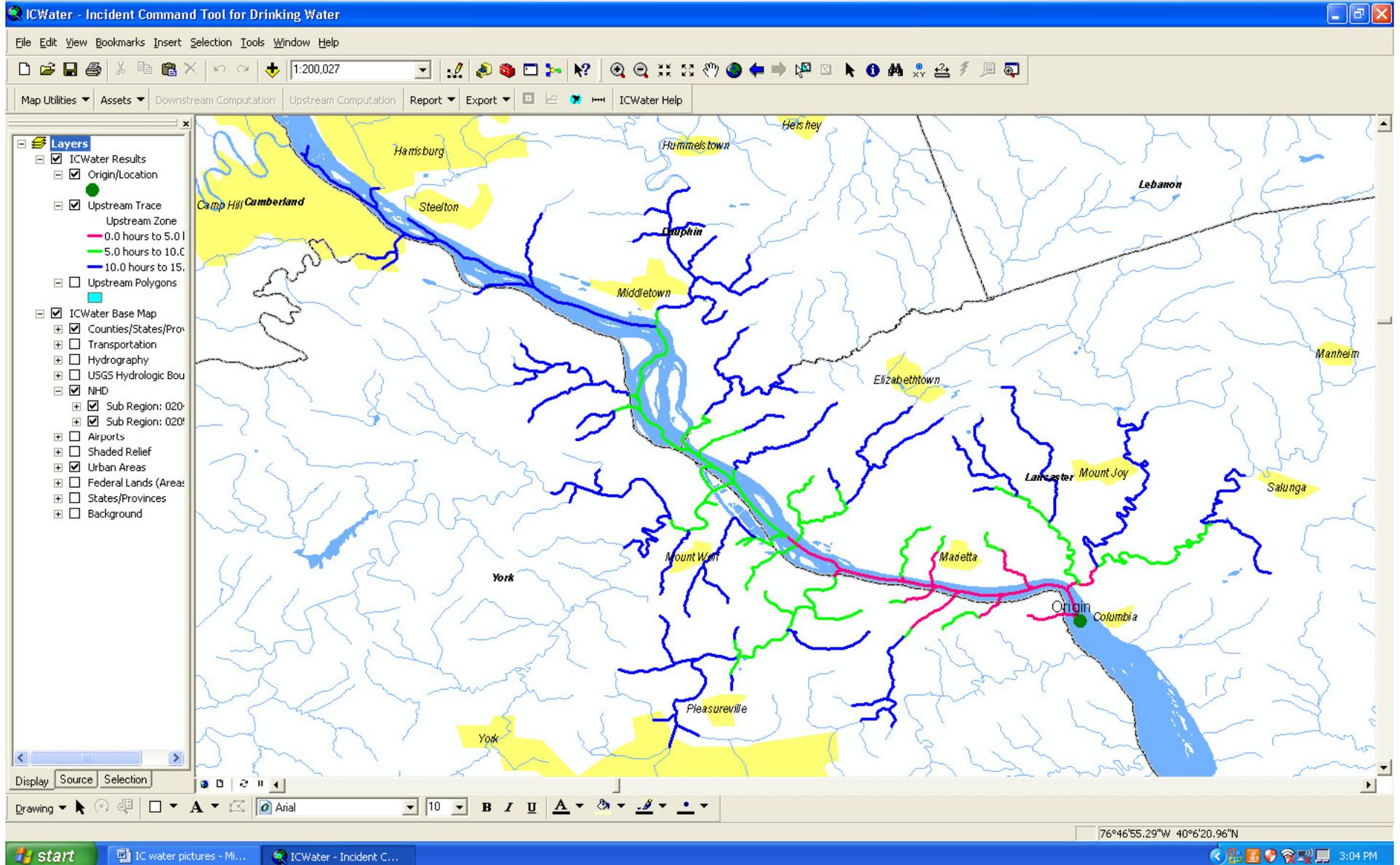


IC Waters

Upstream Computation

- Predicts TOT to point of origin
- Select Flow
 - USGS Gage
 - NHD average flow
 - User defined
- Time or distance based

IC Waters



Future Direction of the Early Warning System

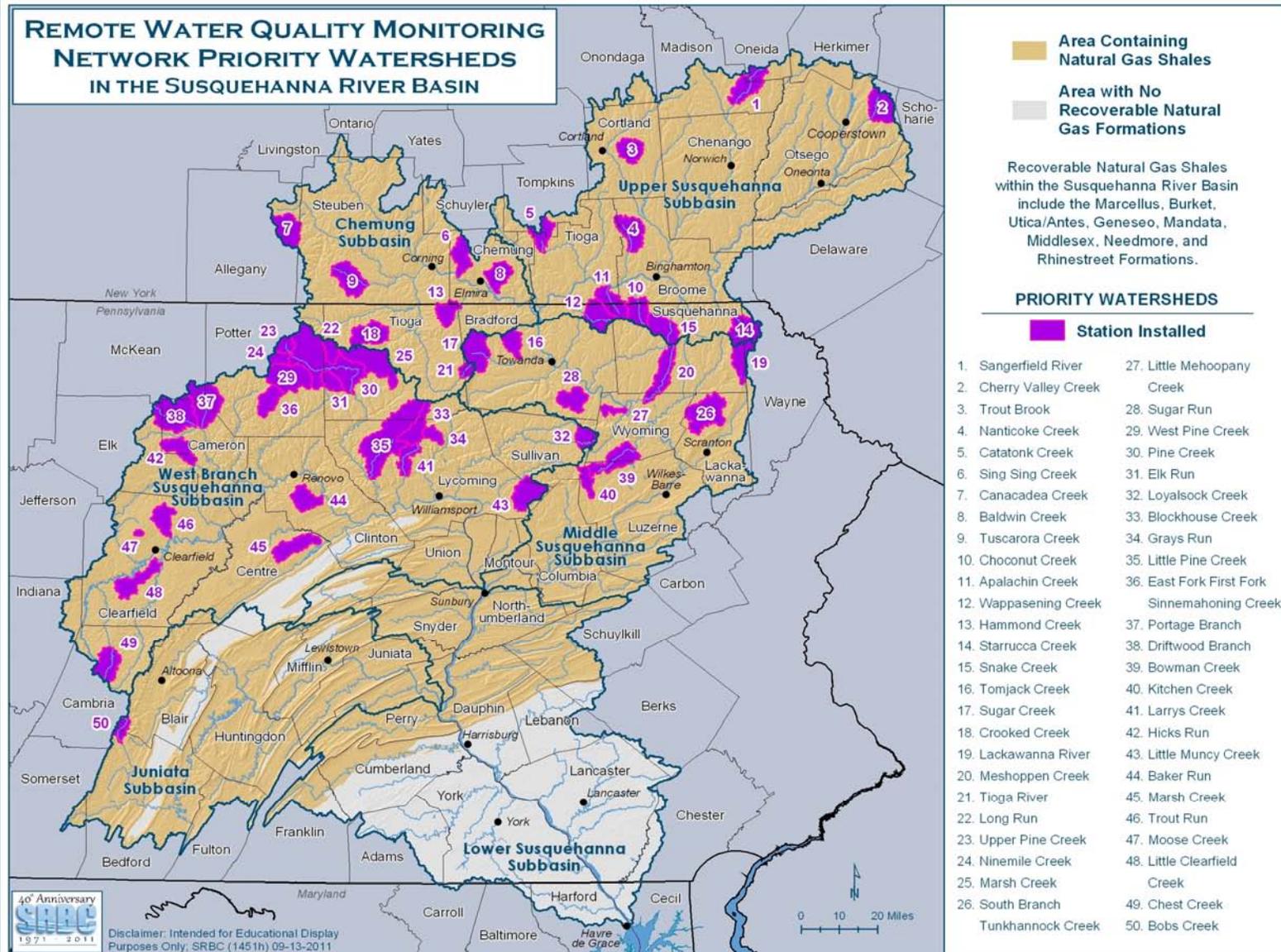
Current Monitoring Equipment Setup



Remote EWS Station
near Elmira, NY.



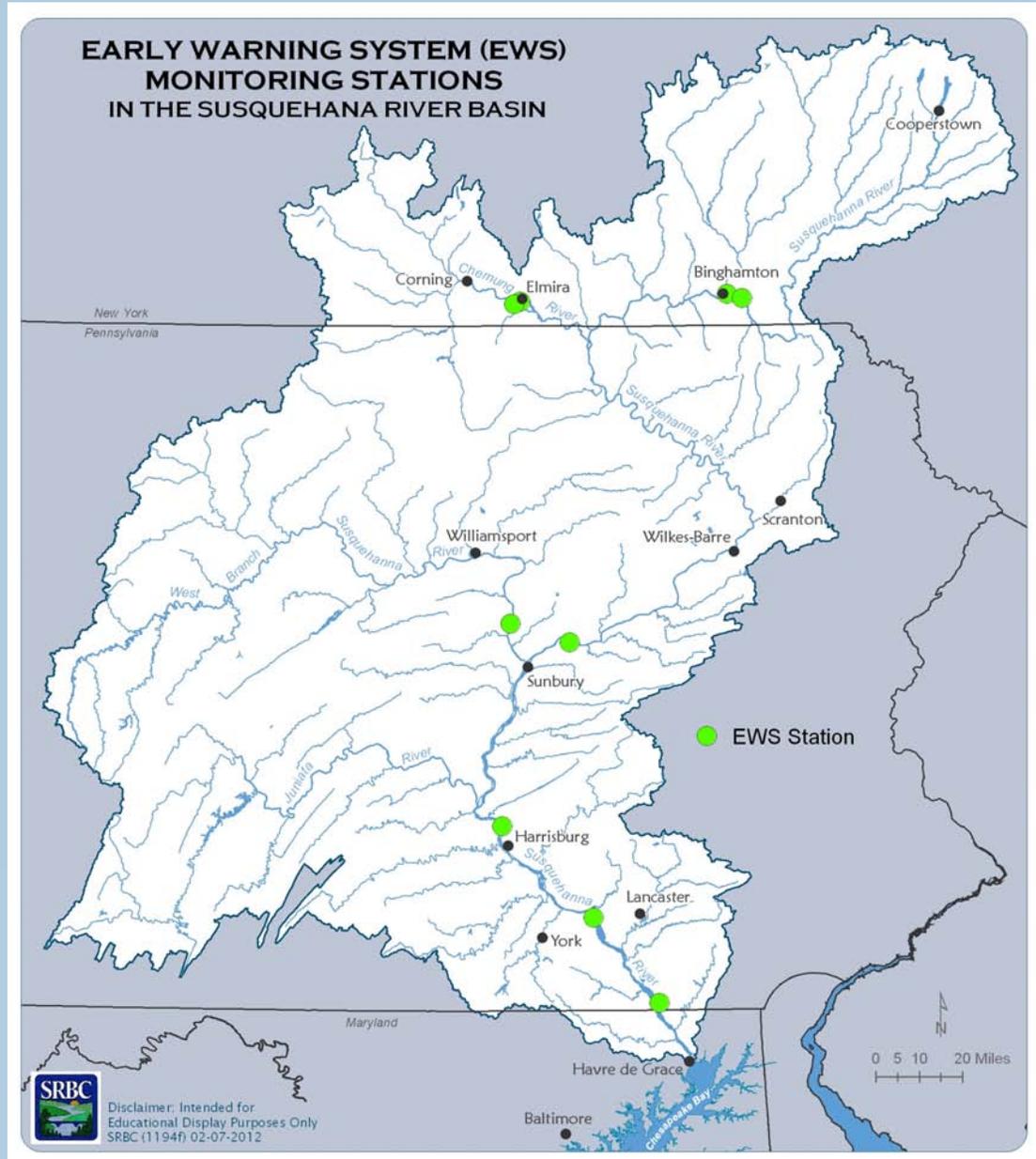
SRBC RWQMN Sites



Current EWS Station Locations

Possible Expansion-

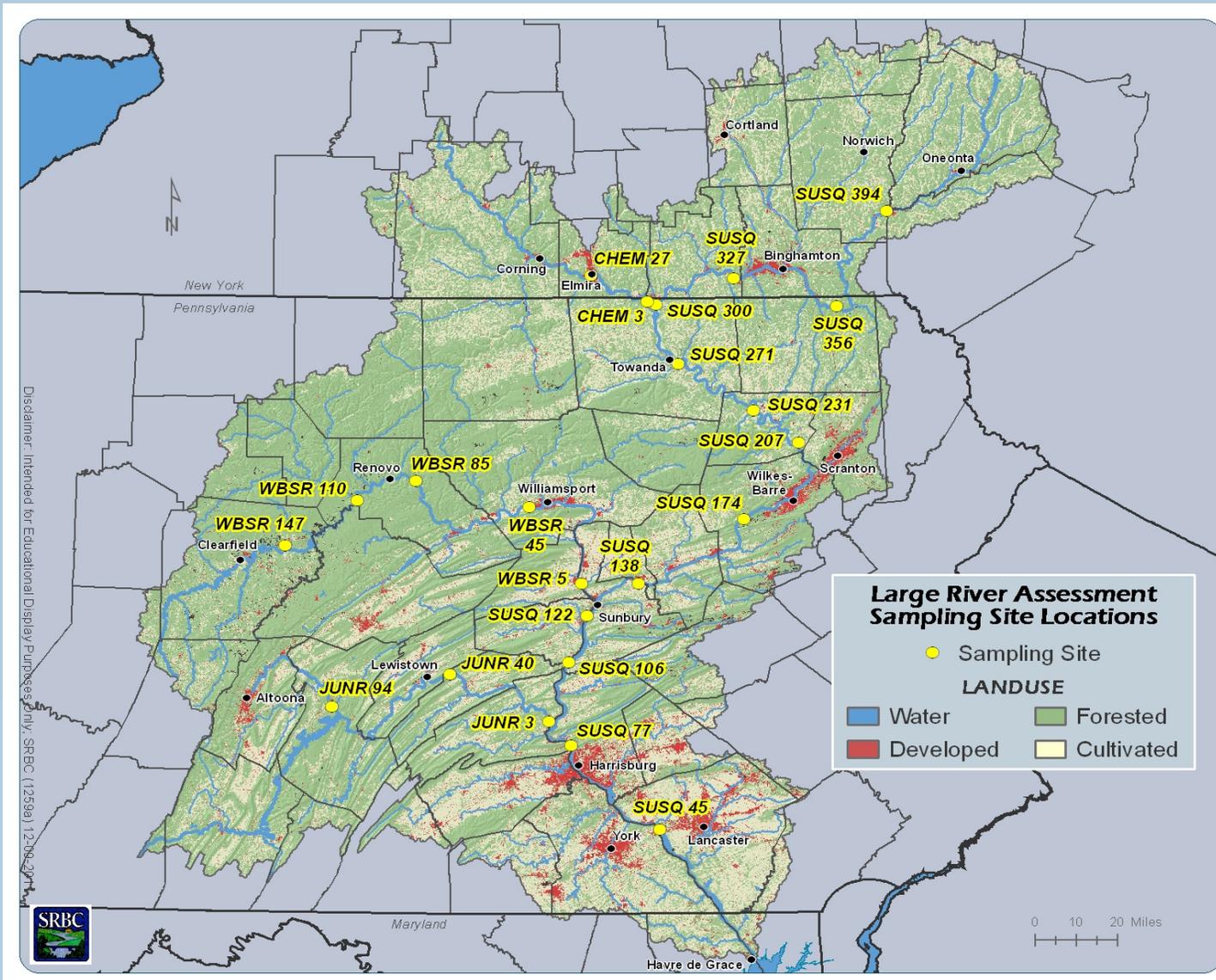
- Upstream
- Large Tributaries



Monitoring Parameters

- Collected by all EWS stations-
 - Temperature
 - pH
 - Turbidity
- Additional Parameters collected by some EWS stations-
 - Dissolved oxygen, conductivity, total organic carbon, chlorophyll
- Future parameters of interest?

SRBC Large River Survey Sites



Future communications and partnerships

- Stakeholder Group
- Emergency Response Group
- Other forms of communication
 - Bulletin board on website
 - Smaller workgroups

Questions and Suggestions?