

ICWater: Incident Command Tool for Drinking Water Protection

Early Warning Monitoring Workshop
Fairfax, VA
August 25, 2004

ICWater Partners

◆ **US Forest Service**

- Linkage to Incident Commanders

◆ **Technical Support Working Group (TSWG)**

- Compatibility with existing consequence assessment tools

◆ **DTRA**

- Training MOU with USFS
- Operation and maintenance

◆ **EPA**

- NHD
- Model validation
- Flow Volume and Velocity

◆ **USGS**

- Comparisons with dye studies
- Location of gages and monitoring stations
- Flow volume and velocity (NE SPARROW Project)

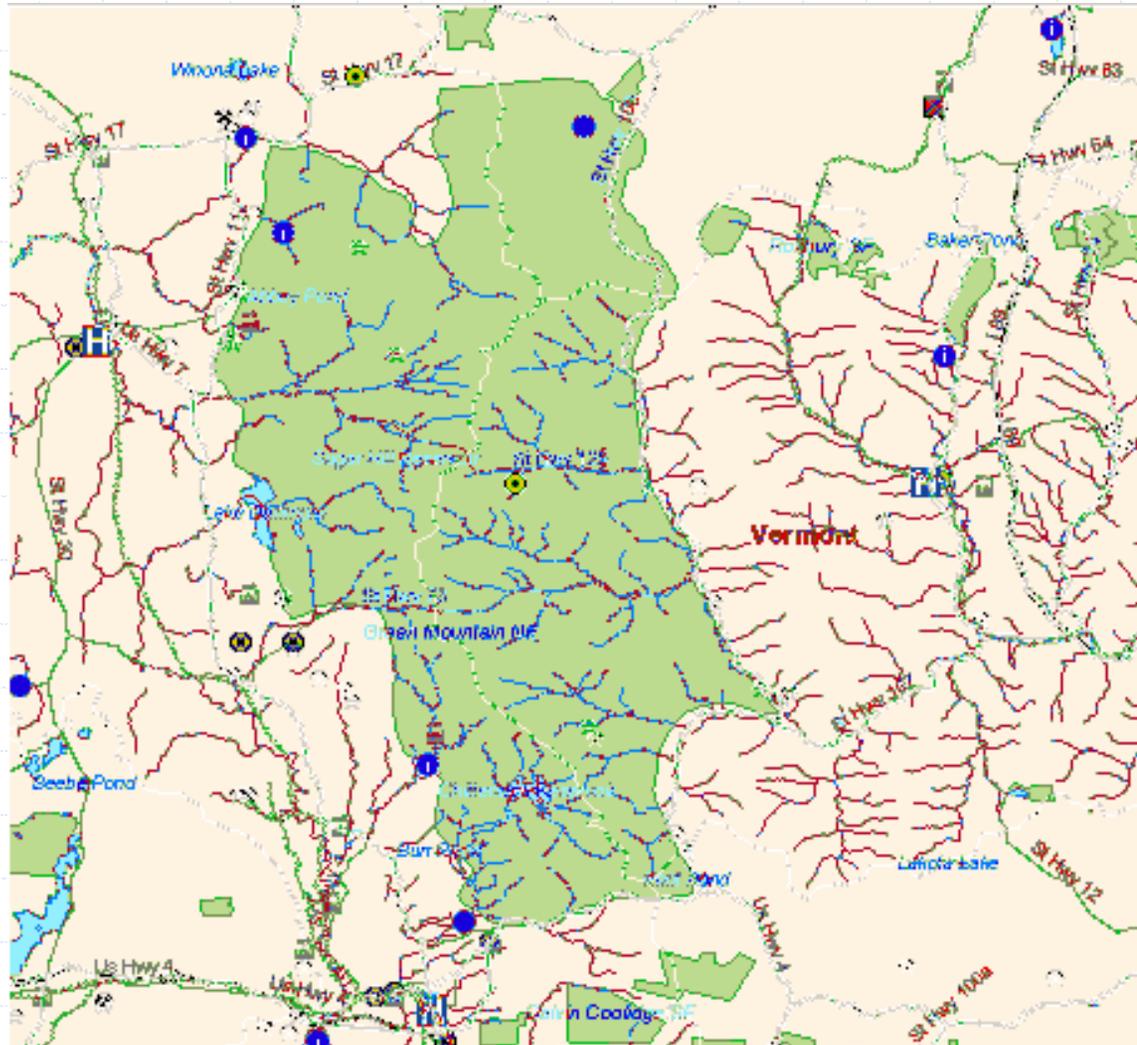
◆ **Interstate Commission of the Potomac River Basin**

- Potomac River Model

Why the Forest Service?

- ◆ Cadre of trained Incident Commanders
- ◆ Experience responding to wildland fires and other major disaster response efforts
- ◆ National Forests are an important source of public drinking water.

US has over 180,000 water systems
Forest Service watersheds serve as sources of drinking water for 3,000
towns (60 million people)



RiverSpill Model

- ◆ Provides Engine For Fate & Transport Computations
 - Provides Business Logic for the Network
- ◆ Provides Predictions For Every Segment and Node Encountered
 - Breakthrough Curves
 - Peak Concentrations
 - Lead & Trail Edge Times of Arrival

National Hydrography Dataset (NHD)

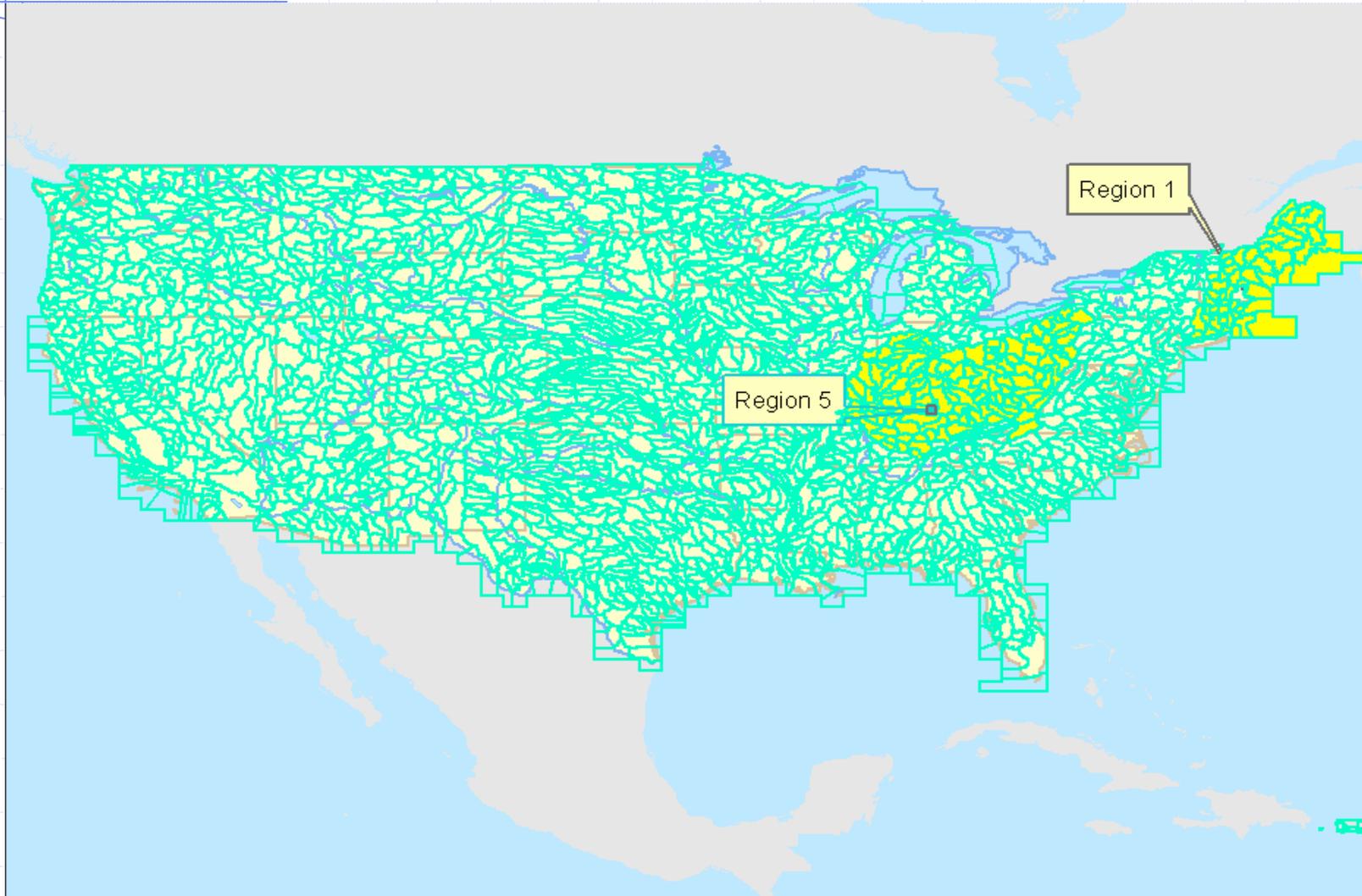
◆ USGS

- Available in NHDinGEO format
- Flow volume and velocity data – NE SPARROW Project

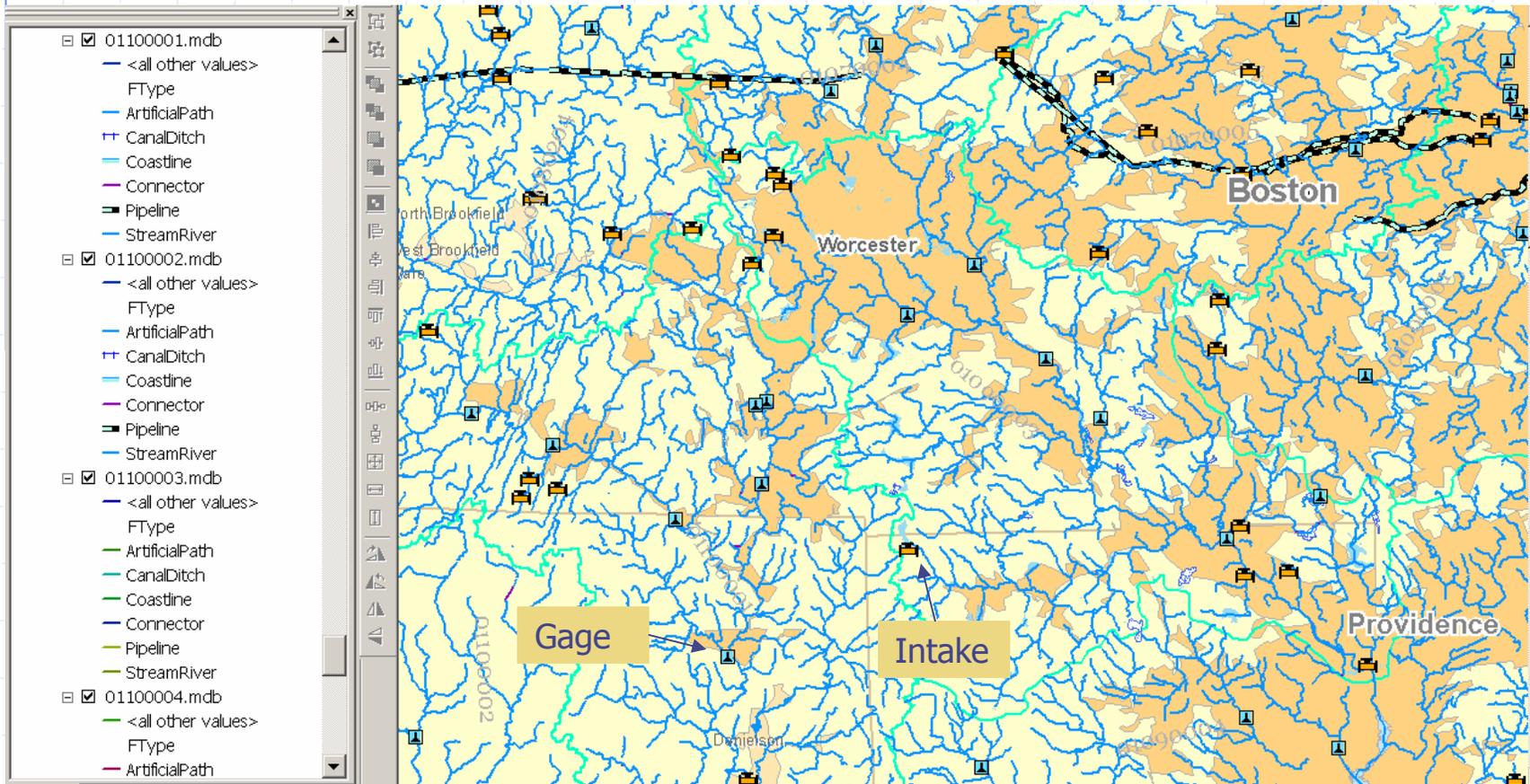
◆ EPA Office of Water:

- making NHD available to the ICWater Project from their Reach Address Database (RAD)
- NHD-Indexed Public Water Supply Intakes
- Flow volume and velocity attributes

Development Regions



NHD Features



Supporting Databases

◆ Public Water Supply Intakes

- http://oaspub.epa.gov/enviro/sdw_report.first_table?report_id=726187&pwsid=VA3550051&state=VA&source=Surface%20water%20&population=90683&sys_num=0

◆ USGS Stream gages

- 19,590 current and historical gages (7,160 real-time)
- <http://waterdata.usgs.gov/nwis>

◆ Hydrologic Units (HUC) (Watershed Boundaries)

- Created a downstream/upstream HUC navigation table

◆ HAZMATS

- Toxic Chemical Release Inventory (TRI)
 - ◆ http://oaspub.epa.gov/enviro/tris_control.tris_print?tris_id=11040CLLCR1403F
- Risk Management Plan Sites (RMP)
- Superfund Sites (CERCLIS)
 - ◆ http://oaspub.epa.gov/enviro/cerclis_web.report?pgm_sys_id=WY0000045138
- Hazardous Waste (RCRA)
 - ◆ http://oaspub.epa.gov/enviro/fii_query_dtl.disp_program_facility?pgm_sys_id_in=WYD981547706&pgm_sys_acrn_in=RCRAINFO
- Landfills (USGS)

Supporting Databases (continued)

◆ Mines

- Minerals Availability System (Bureau of Mines)

◆ Dams

- National Inventory of Dams (Corps of Engineers)
- <http://crunch.tec.army.mil/nid/webpages/nid.cfm>

◆ Dischargers

- Permits Compliance System (NPDES)
 - ◆ http://oaspub.epa.gov/enviro/fii_query_dtl_disp_program_facility?pgm_sys_id_in=SD0020036&pgm_sys_acnm_in=PCS
 - ◆ http://oaspub.epa.gov/enviro/pcs_det_reports.pcs_tst?npdesid=SD0020036&npvalue=1&npvalue=2&npvalue=3&npvalue=4&npvalue=5&npvalue=6&npvalue=7&npvalue=8&npvalue=10&npvalue=11&npvalue=12

◆ Reservoirs

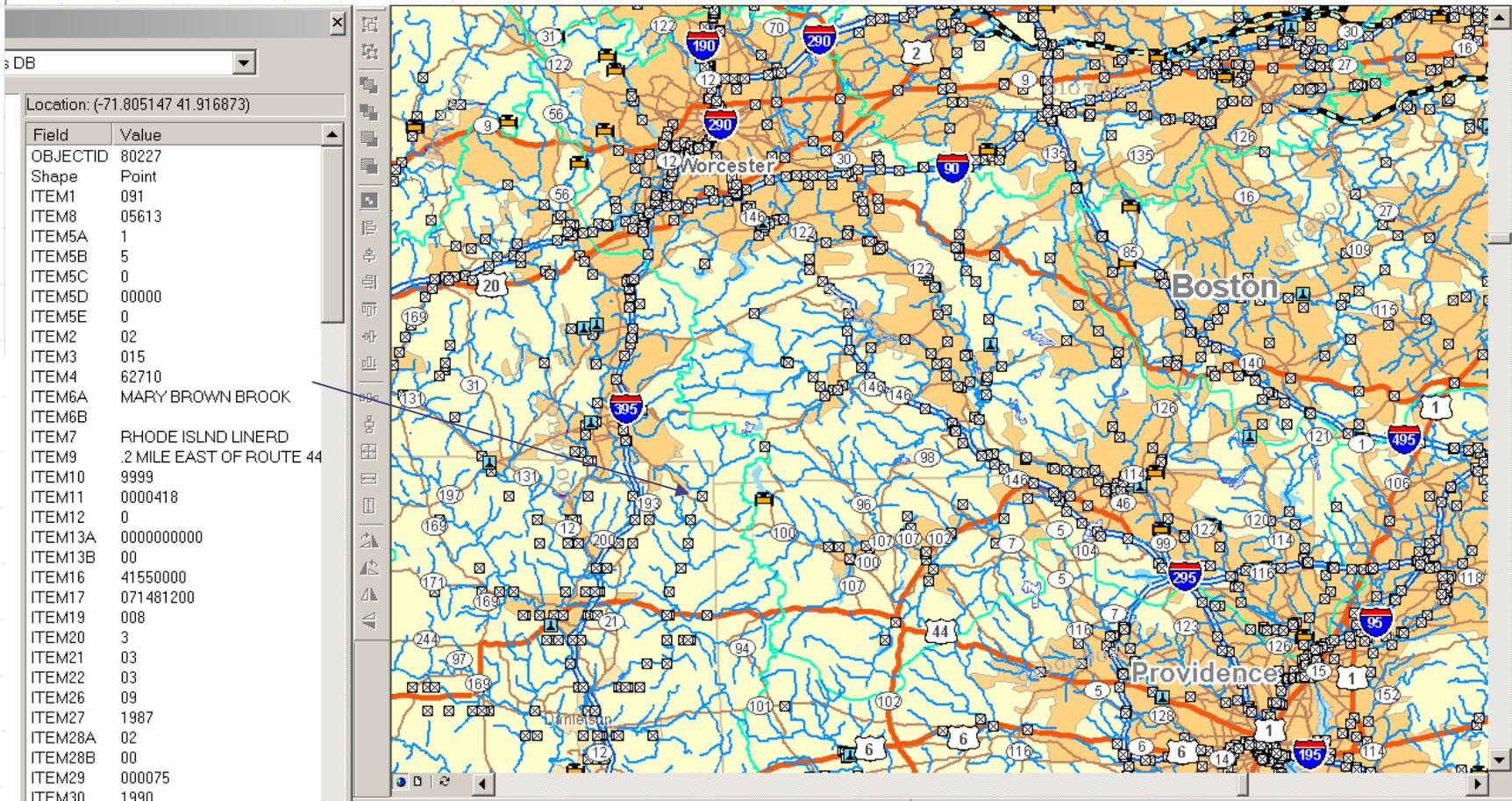
- USGS Reservoir characteristics

Supporting Databases

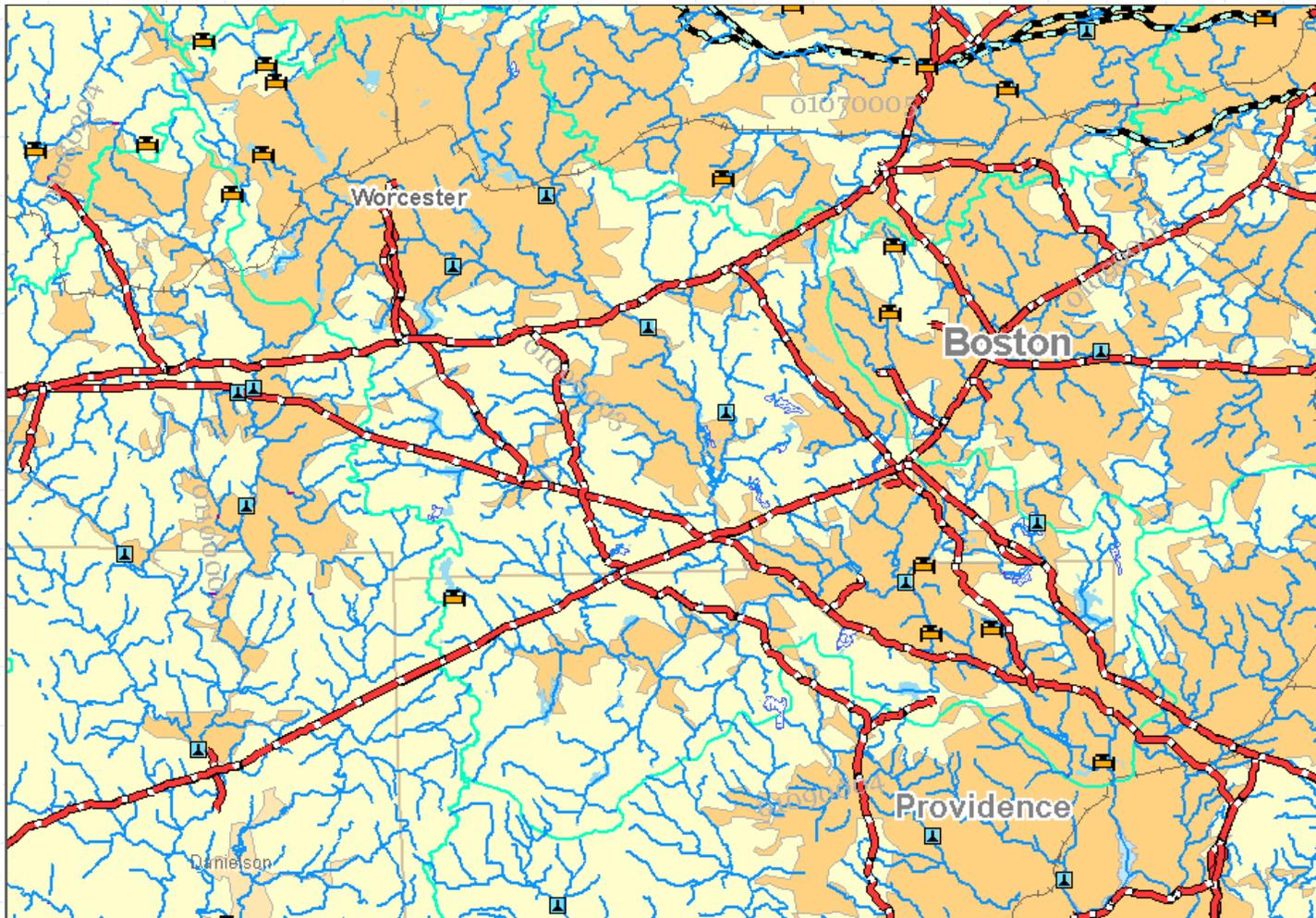
- ◆ National Pipeline Mapping System
- ◆ National Highway Bridge Inventory
- ◆ USFS Roads
- ◆ ESRI Data
 - Roads
 - Railroads
 - Federal Lands (includes USFS lands)
 - Boundary files (state, county, zip,....)
- ◆ US Census Data (2000 population)
- ◆ Hospitals
- ◆ Schools

Potential Spill Sources

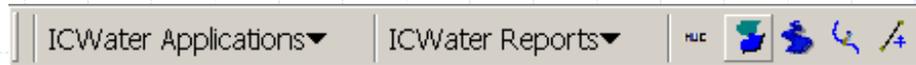
National Highway Bridge Inventory



Potential Spill Sources National Pipeline Mapping System



ICWater Toolbar and GUI



- Clear Incident
- NHD Update Tool
- Upstream Computation
- Downstream Computation
- Animate the current trace

- Export Trace...
- Create Detailed Report

ICWater - RiverSpill

File Help

Spill Location

Longitude: -71.7839 Latitude: 42.3250

Spill Locator Tool [Loc] Spill Location Wizard [Wizard]

Agent Finder

Biological Chemical Radiological User Defined Search

Chemical Warfare Toxic Industrial Chemical Toxins All

3-quinocidimyl benzilate (BQ)
Acrofen
Aldrin
Anatoxin
Arsine
Botulinum toxins (BOT04)
Brevetoxin
Bromine
Chlorine
Chronic acid aerosol
Digustoxin
Conotoxin
Cyanide

Agent Parameters

Level of Concern (mg/l): 0.075
Half Life (days): 399

[Agent References]

Incident Analysis Parameters

Release Type

Instantaneous
 Continuous Time (hours): 0.0

Source Strength

Mass (kg): 50
Count per mg: 1

Stream Flow

NHD Dataset: NHD Mod. Res.

Use one of the following two methods to select a gage station:

Use NHD Average Flow Velocity Data
 Have ICWater Automatically select a gage station
 Select a real-time flow gage station
 Create a real-time flow gage station (adding entry...)

Gage Station Data: Reach: 01090001000379

Average Flow (cfs): 1.8
Average Stage (feet): 1.1

Temperature: Text

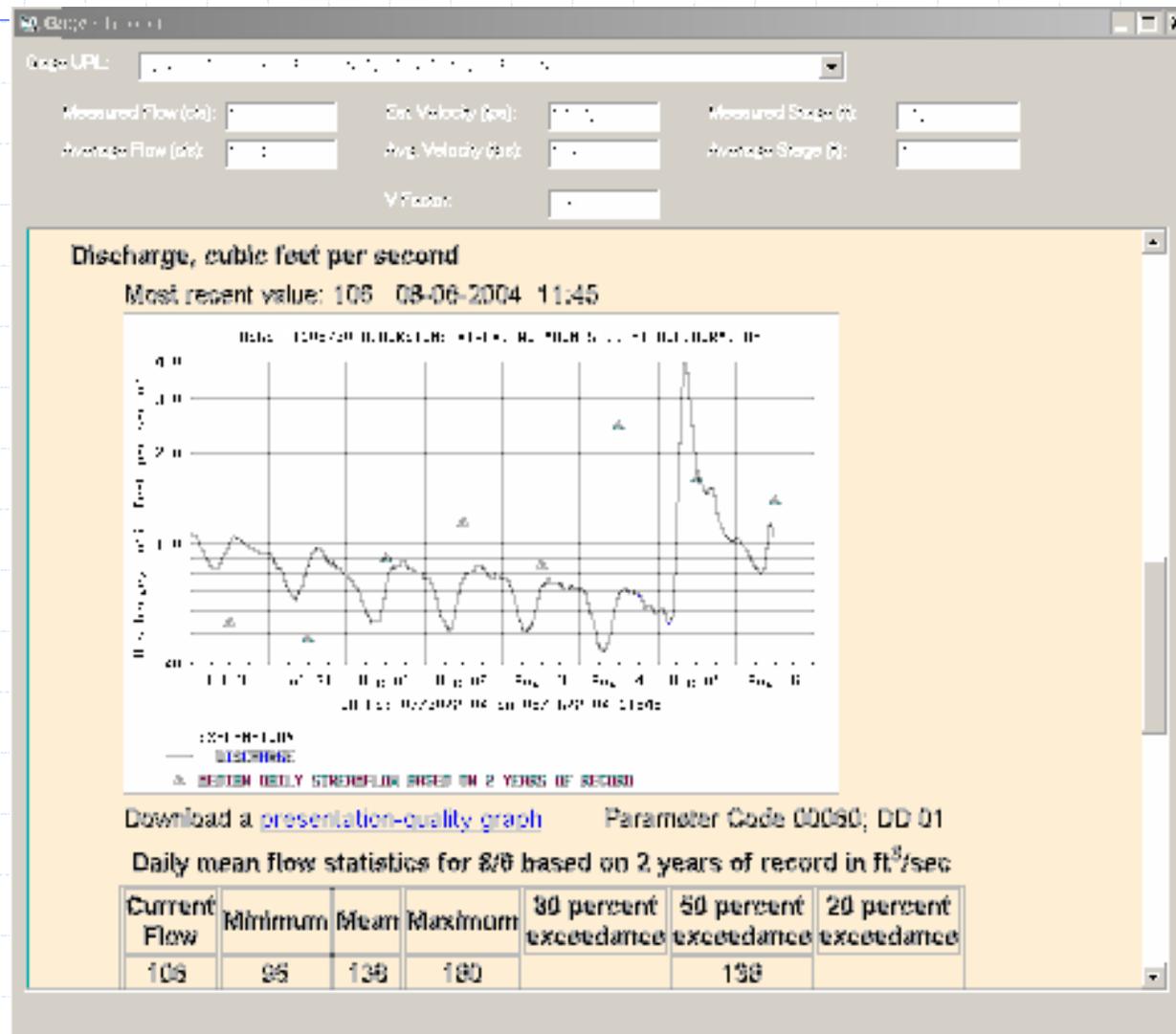
Model Parameters

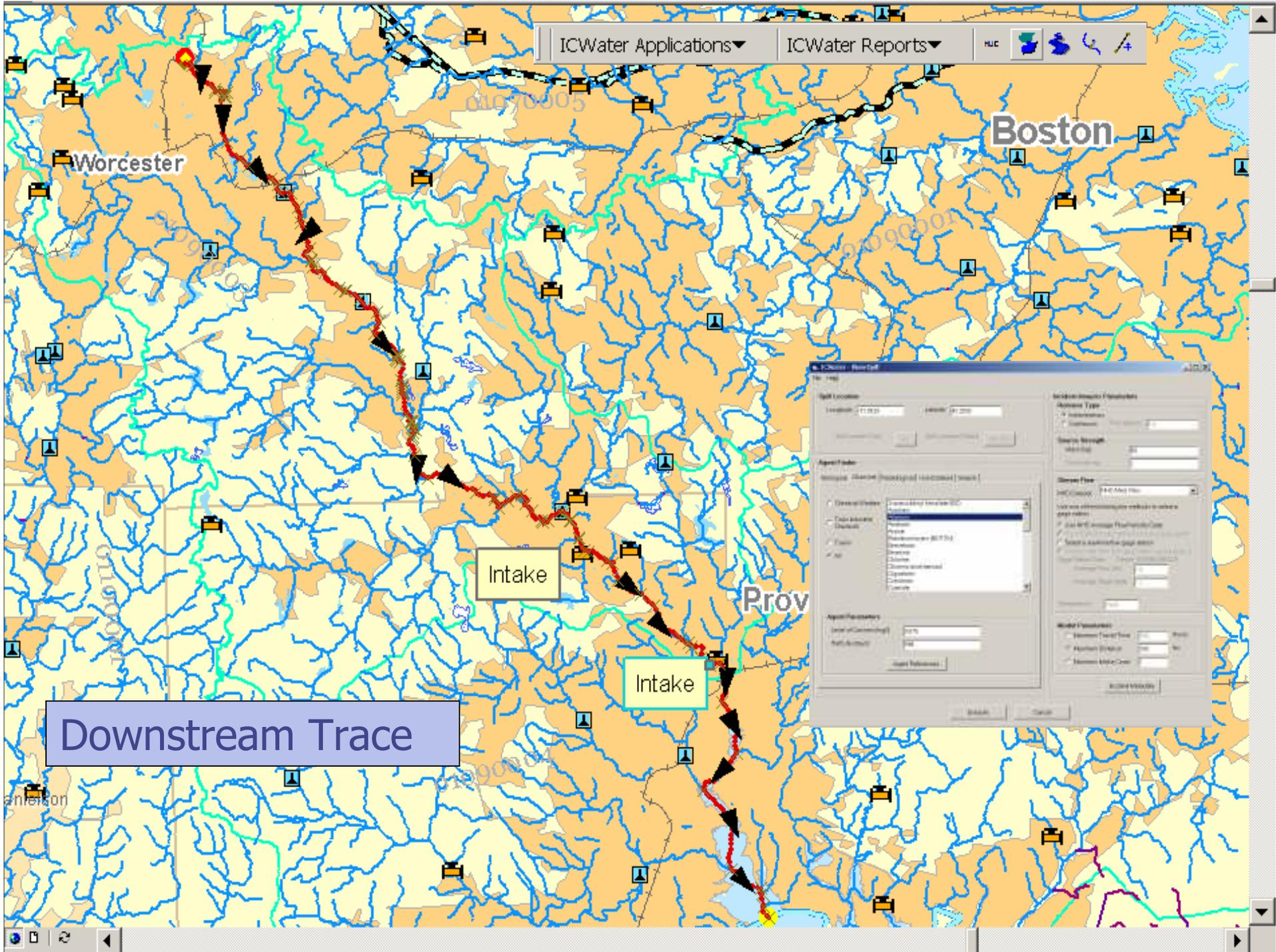
Maximum Travel Time 1.00 Hours
 Maximum Distance 1.00 km
 Maximum Intake Count 5

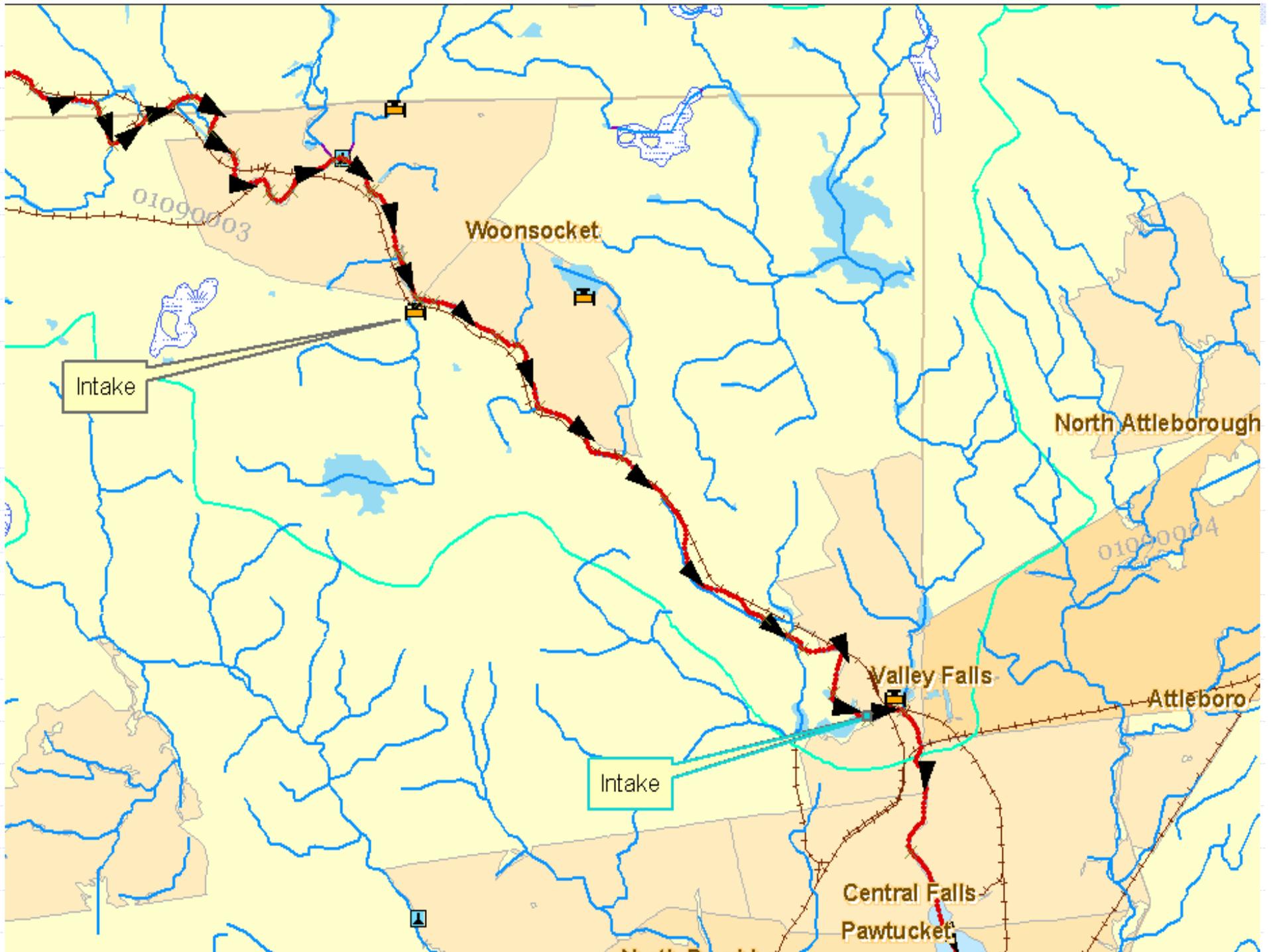
[Incident Metadata]

[Execute] [Cancel]

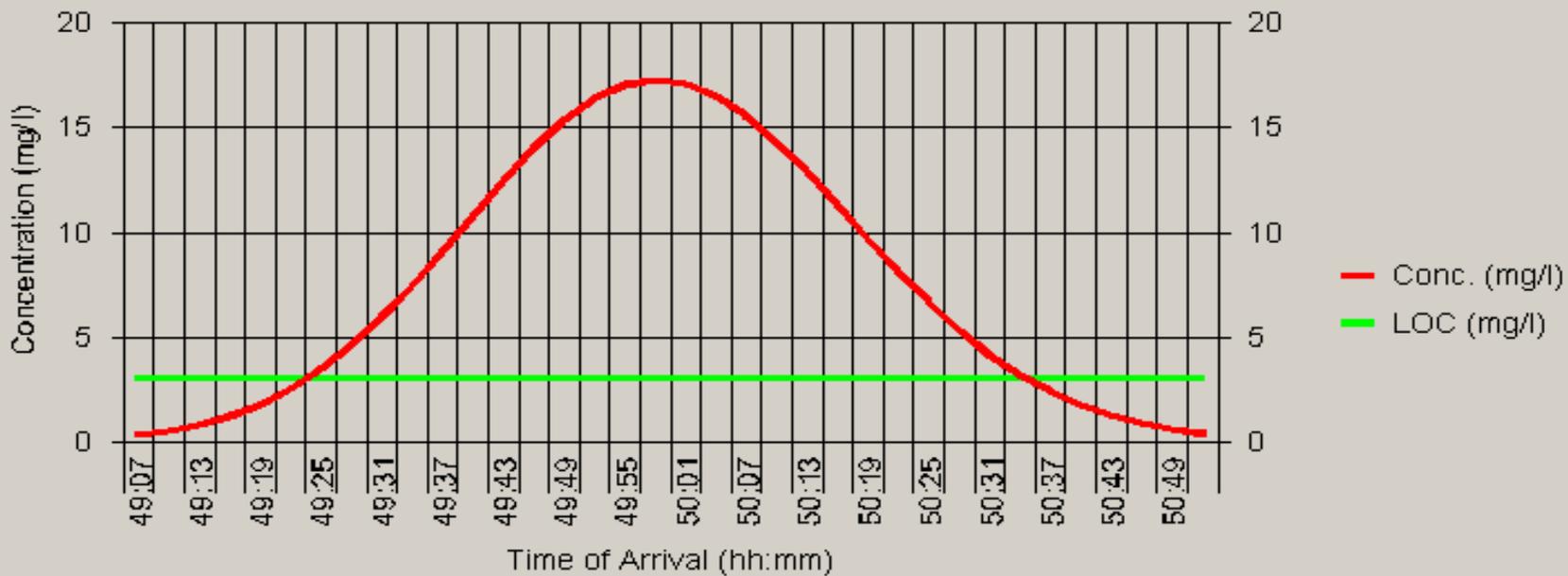
Linkage to real-time stream flow







ICWater Breakthrough Curve

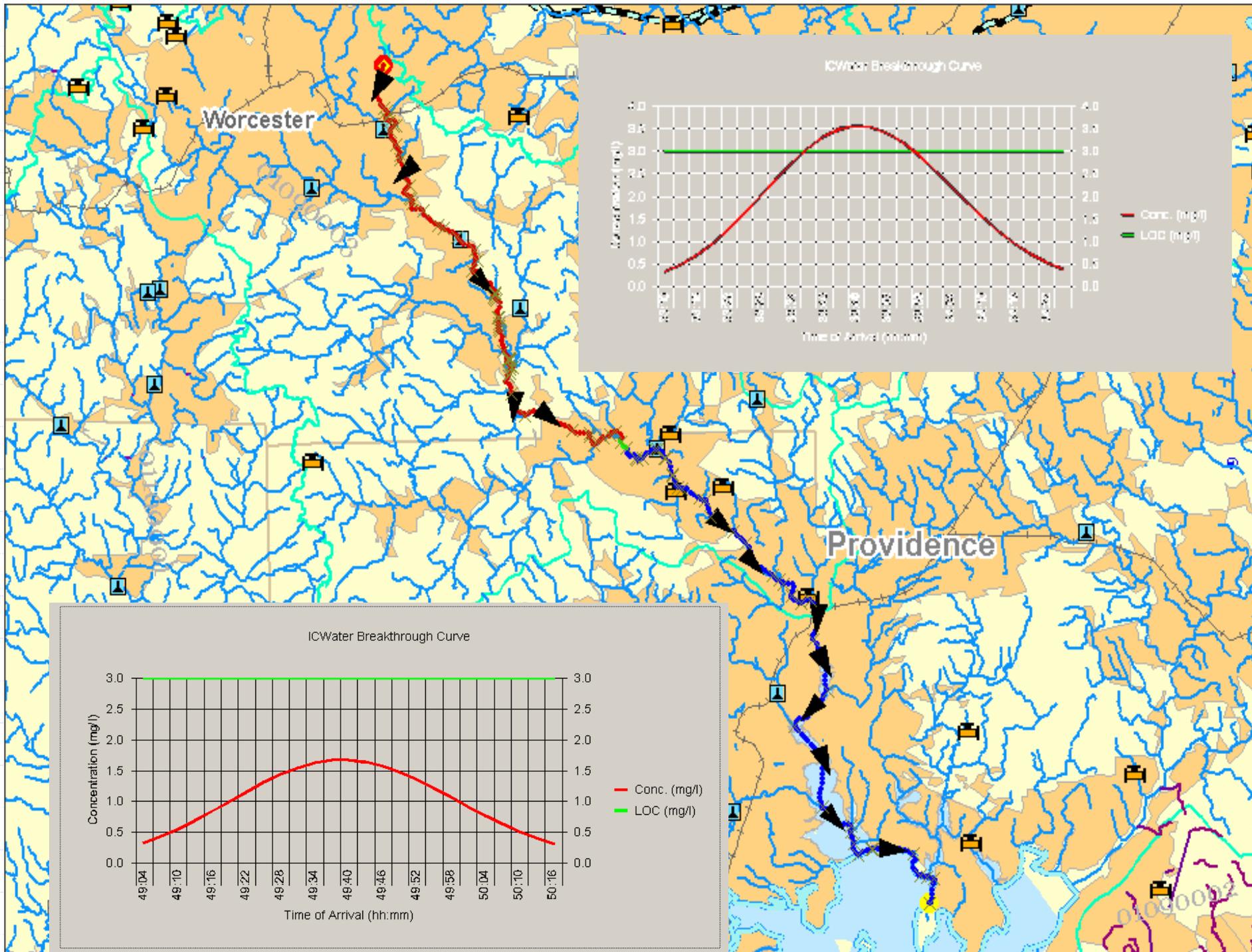


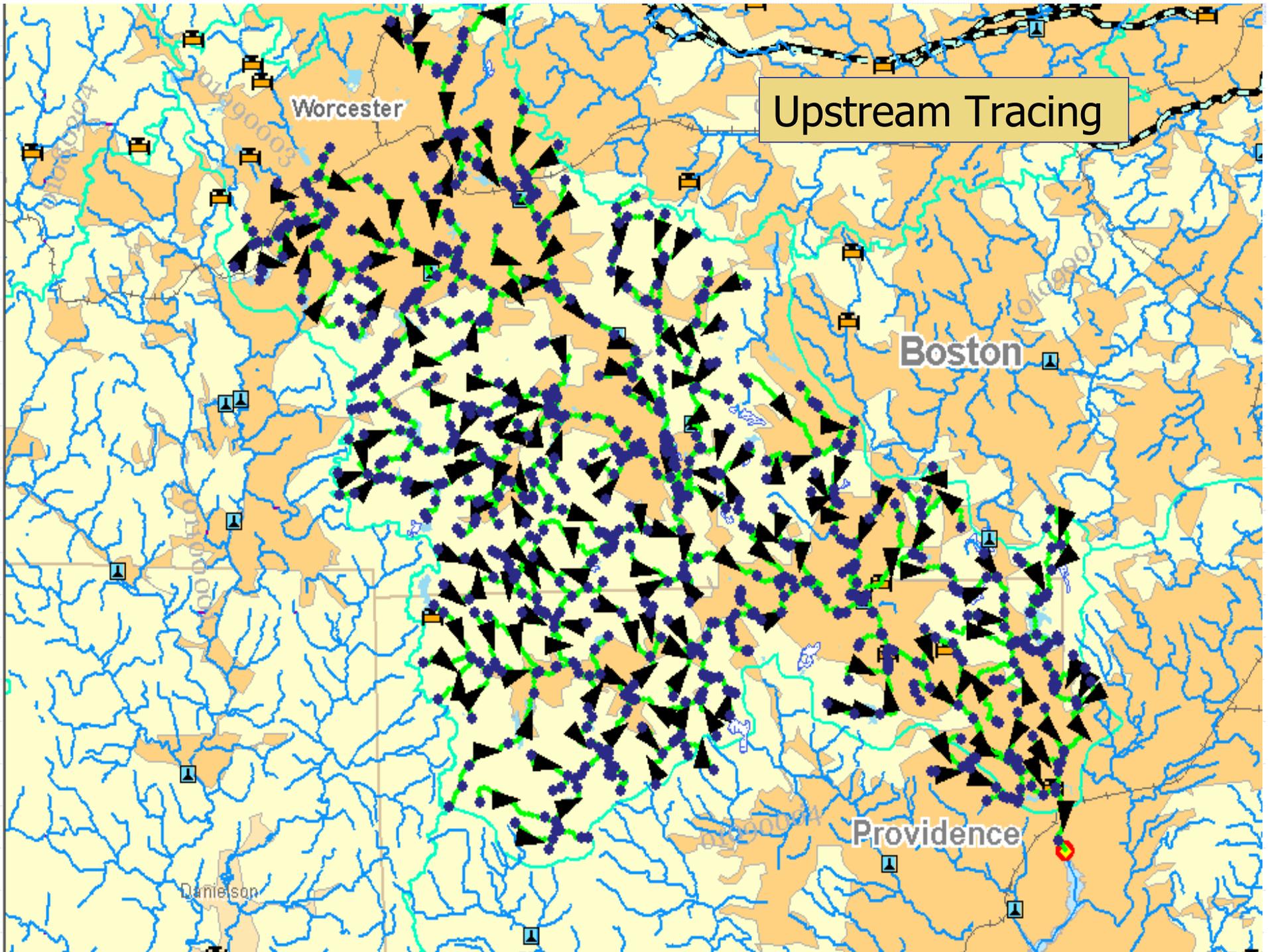
Incident Description:

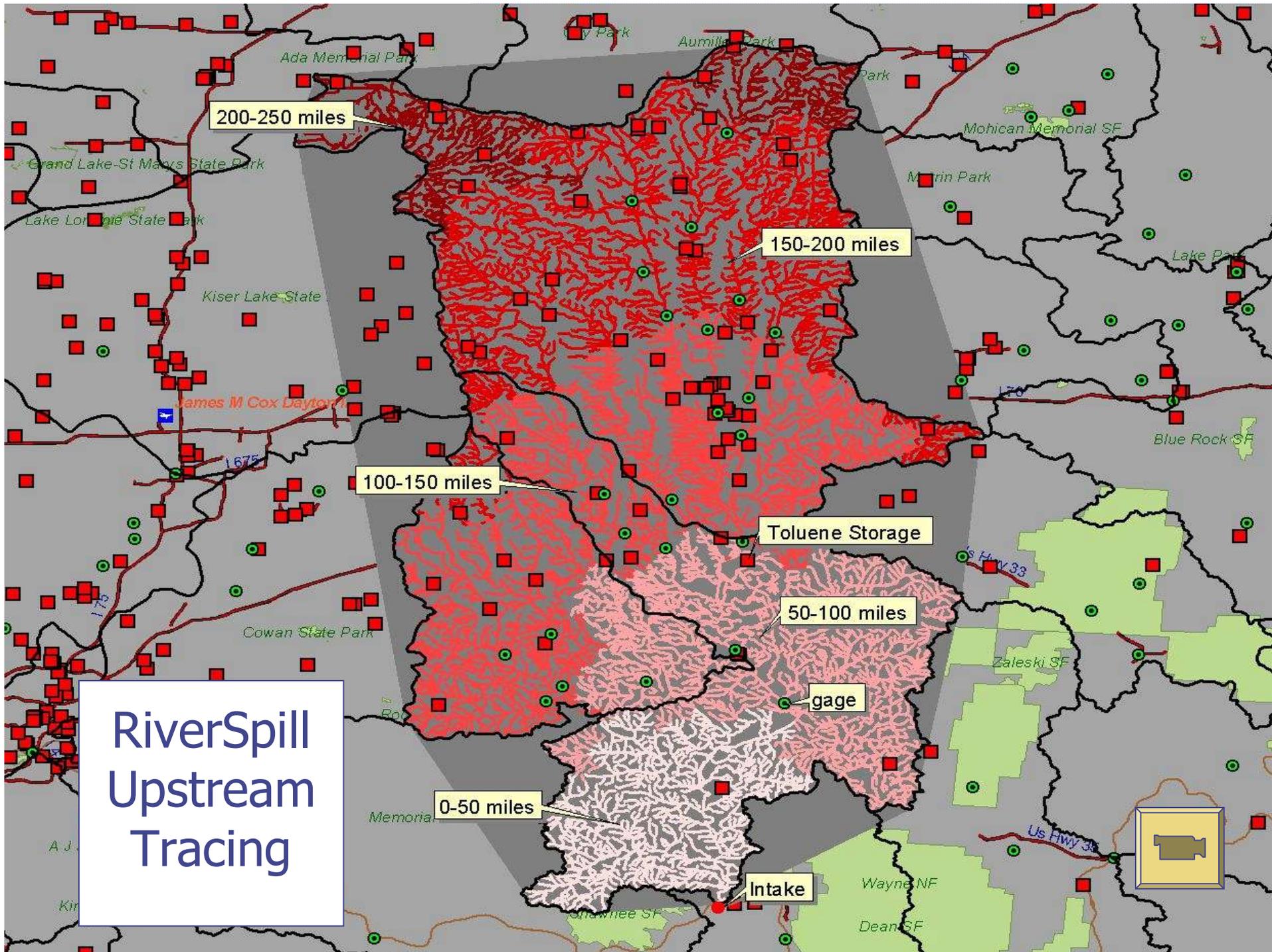
Material: Arsinine
Location: -71.7108, 42.2698 Generated at: 8/10/2004 7:10:19 AM
Material Class: Chemical Agent
Release: Instantaneous Release
Mass: 50 kg

Done

Print







RiverSpill Upstream Tracing

Program Contacts

◆ Doug Ryan

- USFS, (703) 605 5284, dryan01@fs.fed.us

◆ Perry Pederson

- TSWG, (703) 602-6215, pedersonp@tswg.gov

◆ Kevin McCormack

- USEPA, (202) 564 3890, mccormack.kevin@epa.gov

Technical Contacts

◆ William B. Samuels, Ph.D

- SAIC, (703) 676 8043, william.b.samuels@saic.com

◆ Rakesh Bahadur, Ph.D

- SAIC (703) 676-8048, rakesh.bahadur@saic.com

◆ Project Website

- <http://eh2o.saic.com/icit>