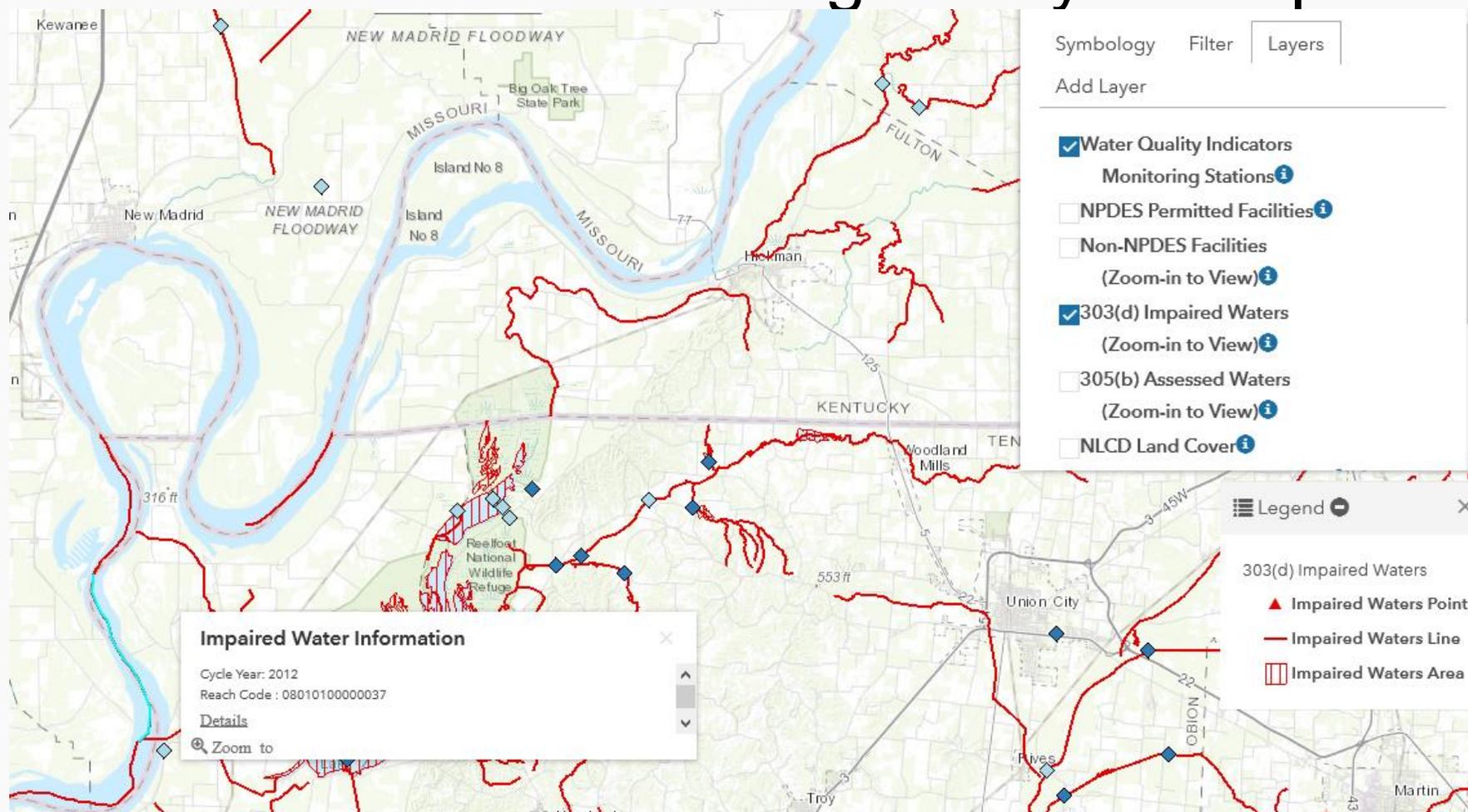


# **Water Quality Indicators (WQI) Tool Version 2.5**

View, Focus, and Screen Ambient Monitoring Data

<https://echo.epa.gov/maps/wqimap>

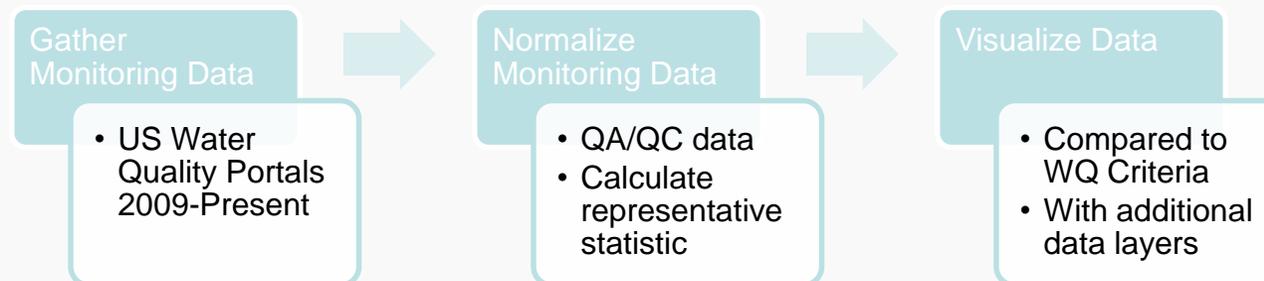
# Problem: Issues Focusing Solely on Impaired Waters



303(d) Listed As Impaired Waters Indexed to NHDPlus Version 2.1, EPA OW

- State water standards vary
- State water assessments are a snapshot in time
- Most water bodies not assessed
- Impairment data doesn't qualify severity

# Project Approach



- Derive and use available total nitrogen and total phosphorus measurements in Water Quality Portals data (2009-Present).
- Calculate relevant statistics (percentiles, counts) with data and compare to CWA 304(a) ANE Criteria, Harmful Algal Bloom (HAB) Criteria, user supplied criteria.
- When total nitrogen is not reported, derive it by combining subspecies of nitrogen present in the NWIS and STORET.
- Only measurements reported as total phosphorus are used.
- Other important steps:
  - identifying and considering non-detects – currently substituting  $\frac{1}{2}$  detection limit
  - identifying and averaging duplicate samples
  - identifying and validating ambiguously reported data
  - identifying and rejecting poorly reported data (e.g. missing units)



## Version 2.5 New Features

- Data Outside of CON-US Now Available
- Upstream Discharger Pollutant Search
  - Find upstream facilities discharging selected pollutant
- Add Your Own Map Layer
- Data Refresh



## Primary Use Cases

- NPDES Inspection Prioritization
- NPDES Permitting
- Water Monitoring

**This is a screening tool!**



## Live Demo

- <https://echo.epa.gov/maps/wqimap>
- ECHO Gov log in required (lan ID and password)



## Future Plans

- Public Release
- Pollutant Expansion
  - Pathogens – e. coli, enterococci, fecal coliforms
  - Lead
- Enhanced Searching
  - Between monitoring locations – ‘Upstream Downstream’ Analysis
  - Between NPDES facilities



## Accessing the Tool

- Go to: <https://echo.epa.gov/maps/wqimap>
  - You will be asked to log into ECHO Gov with your Lan ID and password.
- Resources and Technical Documentation
  - <https://echo.epa.gov/files/echodownloads/Data-Analytics/>
- You must have an ECHO Gov account to access
  - Register here: <https://echo.epa.gov/user/register>
- Download the dataset (publicly available):
  - <https://echo.epa.gov/tools/data-downloads/wqi-data-review>



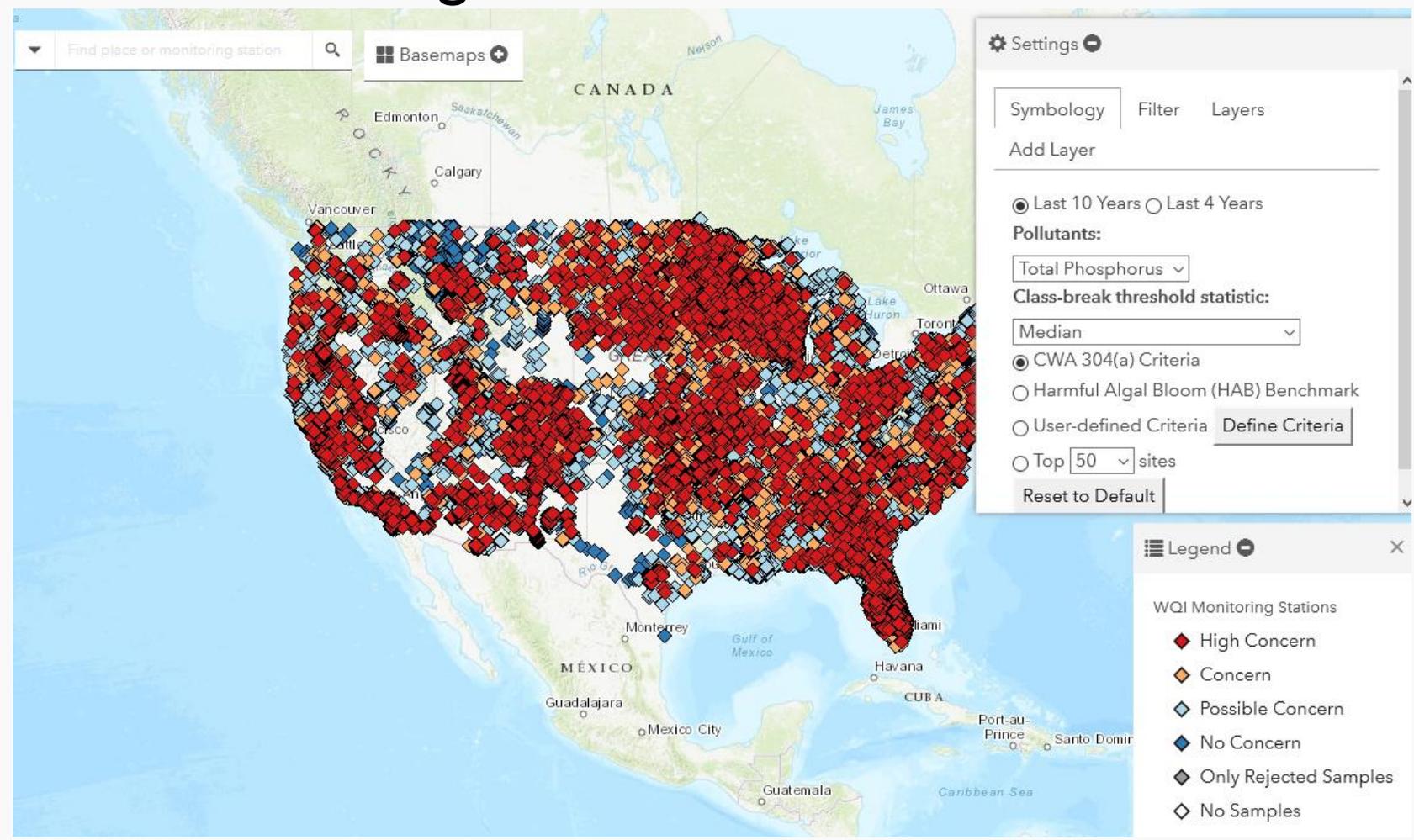
## Questions, Comments & Feedback?

- Rusty Wasem
  - (202) 564-7096
  - [wasem.russell@epa.gov](mailto:wasem.russell@epa.gov)
- 
- A 508 compliant version of this presentation will be made available upon request.



- Slides 12-20 to be used if live demo is not possible.

# Using the Tool: Default View



# Using the Tool: The Legend & Default Breakpoints

Legend 

WQI Monitoring Stations

-  High Concern
-  Concern
-  Possible Concern
-  No Concern
-  Only Rejected Samples
-  No Samples

- High Concern
  - Threshold Statistic  $\geq 10.00$  of criteria
- Concern
  - Threshold Statistic  $5.00 < 10.00$  of criteria
- Possible Concern
  - Threshold Statistic  $1.00 < 5.00$  of criteria
- No Concern
  - Threshold Statistic  $< 1.00$  of criteria
- Only Rejected Samples
  - All samples were rejected by QA/QC
- No Samples
  - $n = 0$

# Using the Tool: Viewing Symbol Pop Up Window

**(1 of 5)**

Organization: USGS Texas Water Science Center(USGS-TX)  
Station ID: USGS-08057410

Location name: Trinity Rv bl Dallas, TX  
Waterbody Type: River/Stream  
EcoRegion: V  
Pollutant: Phosphorus  
Units: µg/L  
304(a) Criteria: 67

Class-break threshold statistic: 880

Summary statistics: **880**

# Samples - 276  
# Samples Rejected - 0  
Max - 2760  
Median - 880  
Time-weighted Median - 780  
70th Percentile - 1365

Class-break threshold statistic: 880

Time-weighted 70th Percentile - 1200  
90th Percentile - 1920  
Time-weighted 90th Percentile - 1860  
# Samples > Default - 274  
Max of Monthly Medians - 2350

Zoom to Search for facilities by:  
Find Upstream NPDES Pollutant Discharger | Find Upstream NPDES Facilities | Find Downstream NPDES Facilities

# Using the Tool: Search for Upstream Facilities

(2 of 2)

Organization: PA DEPARTMENT OF ENVIRONMENTAL PROTECTION(21PA\_WQX)  
Station ID: 21PA\_WQX-WQN0110

Location name: SCHUYLKILL RIVER  
Waterbody Type: River/Stream  
EcoRegion: IX  
Pollutant: Phosphorus  
Units: µg/L  
304(a) Criteria: 36.56

Class-break threshold statistic: 210.5

Summary statistics: +

| Year | Value |
|------|-------|
| 2009 | 150   |
| 2010 | 150   |
| 2011 | 220   |
| 2012 | 320   |
| 2013 | 150   |
| 2014 | 150   |
| 2015 | 220   |
| 2016 | 220   |
| 2017 | 220   |
| 2018 | 150   |
| 2019 | 150   |

Zoom to Search for facilities by:

|  |                                |                                  |
|--|--------------------------------|----------------------------------|
| Find Upstream NPDES Pollutant Discharger | Find Upstream NPDES Facilities | Find Downstream NPDES Facilities |
|--|--------------------------------|----------------------------------|

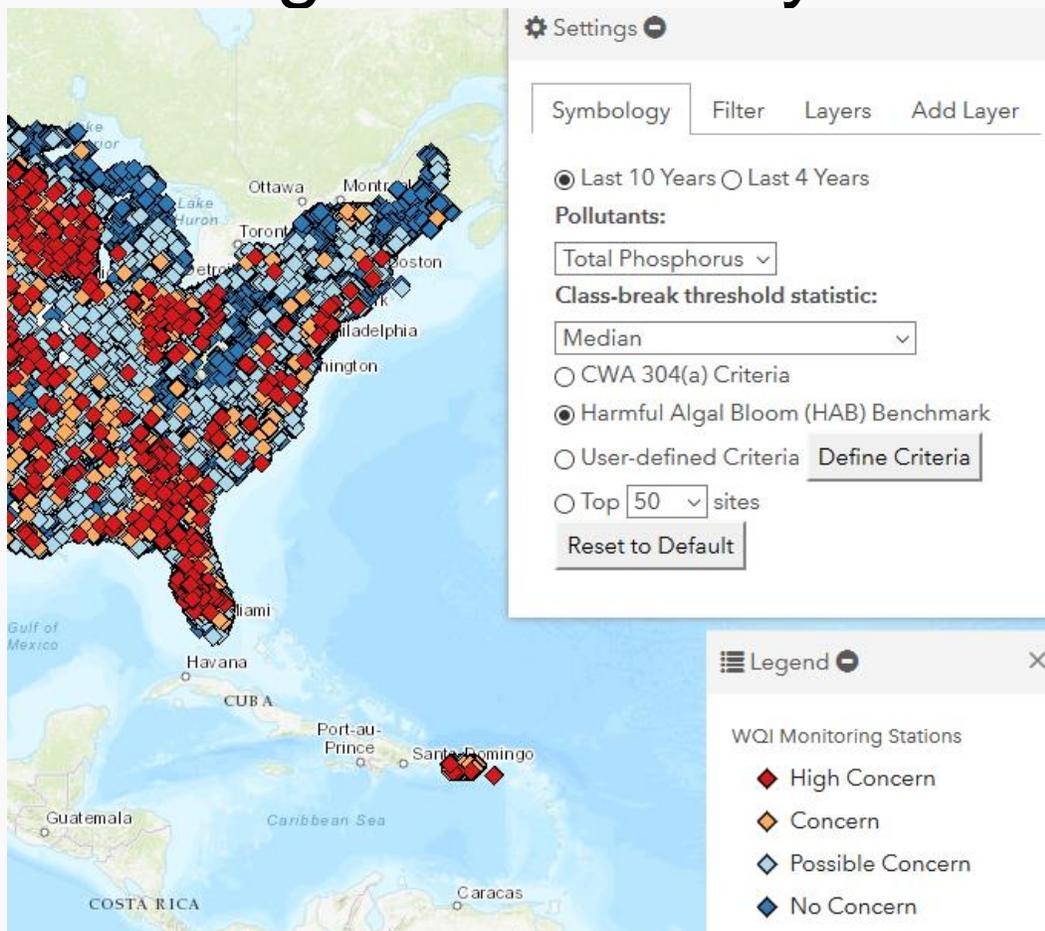
Facilities found within 15km of 21PA\_WQX-WQN0110: 6

Clear Download

Click to search 15 km upstream, downstream, or upstream pollutant point source

Download facility list as a .csv file

# Using the Tool: Symbology Tab Options



- Timeframe
- Pollutant
- Class-break threshold statistic
- CWA 304(a) Criteria
- HAB Criteria
- User Defined Criteria
- Top 50-500 Sites

# Using the Tool: User Defined Criteria and Break Points

Global Phosphorus Custom Criteria and Thresholds

| Criteria             | Concern Breakpoints (% of Criteria) |                      |                      |
|----------------------|-------------------------------------|----------------------|----------------------|
|                      | High Concern                        | Concern              | Possible Concern     |
| <input type="text"/> | <input type="text"/>                | <input type="text"/> | <input type="text"/> |

Global
  Advanced
 Apply & Close
Cancel
Advanced

- Set criteria and breakpoints either globally or by Ecoregion

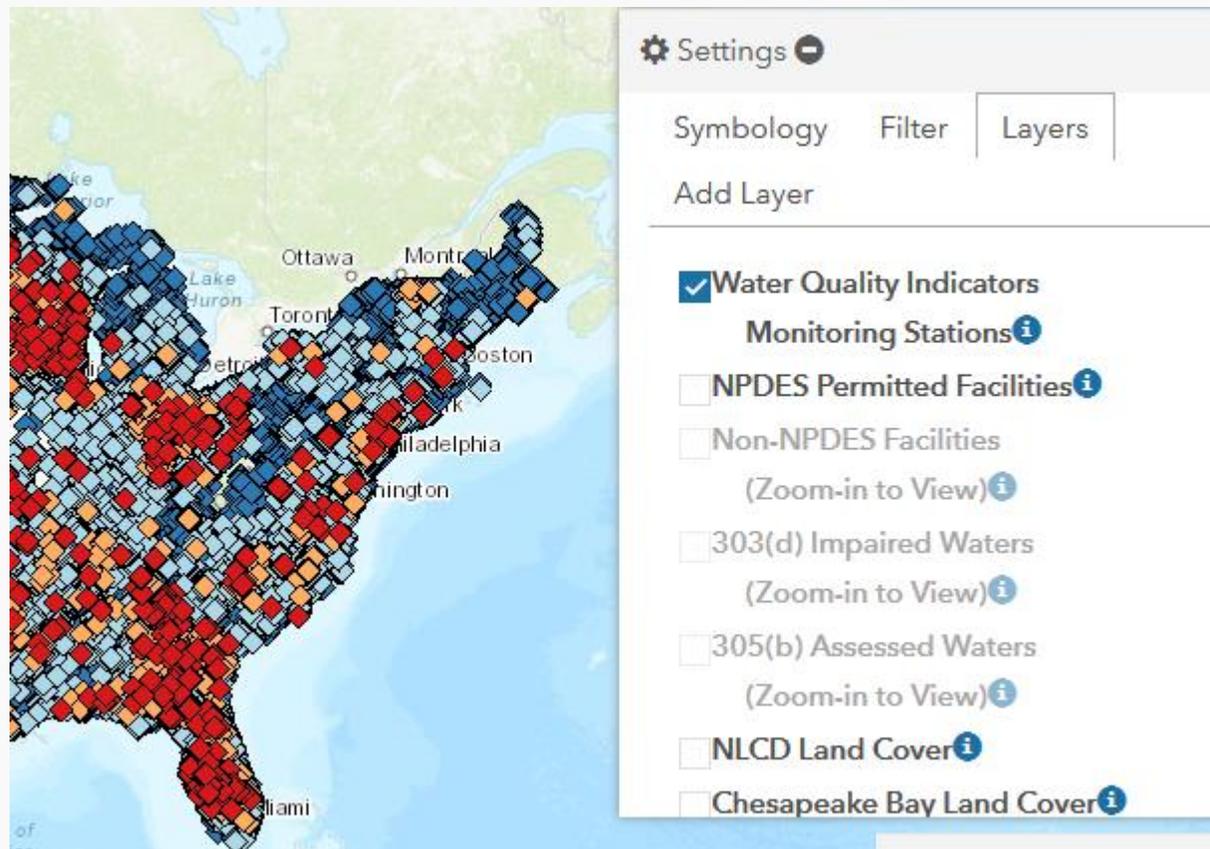
Ecoregional Phosphorus Criteria and Thresholds

Lake  River/Stream

| Ecoregion | Criteria                            |       | Concern Breakpoints (% of Criteria) |         |                  |
|-----------|-------------------------------------|-------|-------------------------------------|---------|------------------|
|           | Default                             | Value | High Concern                        | Concern | Possible Concern |
| I         | <input checked="" type="checkbox"/> | 55    | 10                                  | 5       | 1                |
| II        | <input checked="" type="checkbox"/> | 8.75  | 10                                  | 5       | 1                |
| III       | <input checked="" type="checkbox"/> | 17    | 10                                  | 5       | 1                |
| IV        | <input checked="" type="checkbox"/> | 20    | 10                                  | 5       | 1                |
| V         | <input checked="" type="checkbox"/> | 33    | 10                                  | 5       | 1                |
| VI        | <input checked="" type="checkbox"/> | 37.5  | 10                                  | 5       | 1                |
| VII       | <input checked="" type="checkbox"/> | 14.75 | 10                                  | 5       | 1                |
| VIII      | <input checked="" type="checkbox"/> | 8     | 10                                  | 5       | 1                |
| IX        | <input checked="" type="checkbox"/> | 20    | 10                                  | 5       | 1                |
| X         | <input checked="" type="checkbox"/> | 60    | 10                                  | 5       | 1                |
| XI        | <input checked="" type="checkbox"/> | 8     | 10                                  | 5       | 1                |
| XII       | <input checked="" type="checkbox"/> | 10    | 10                                  | 5       | 1                |
| XIII      | <input checked="" type="checkbox"/> | 17.5  | 10                                  | 5       | 1                |
| XIV       | <input checked="" type="checkbox"/> | 8     | 10                                  | 5       | 1                |

Back to Global
Apply & Close
Cancel
 Set All Criteria to Default

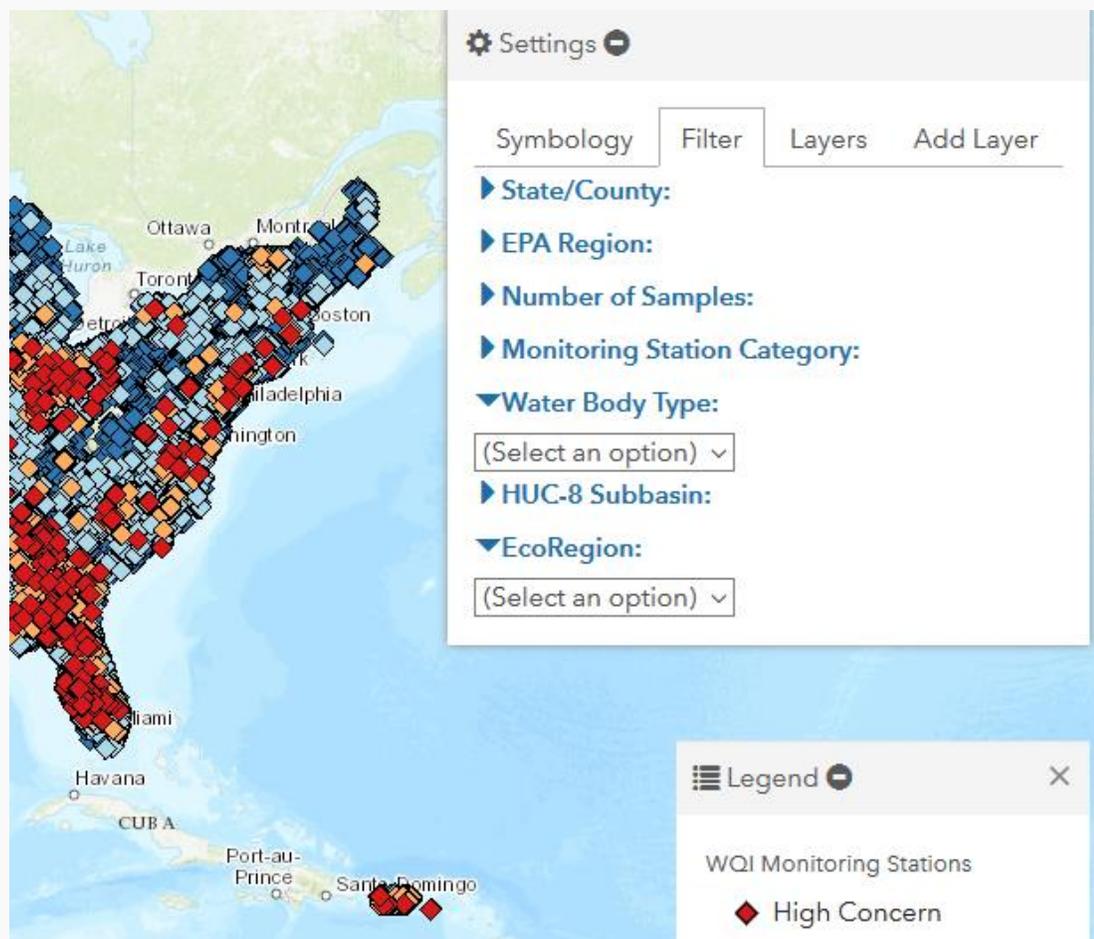
# Using the Tool: Layers Tab Options



- Check Box(s) & Zoom to View Layer(s)
  - NPDES Permitted Facilities
  - CWA 303(d) Impaired Waters\*
  - CWA 305(b) Assessed Waters\*
  - HUC 8, 10 and 12\*
  - NHD+ Flow Lines\*
- Click the *i* to view a layer's legend

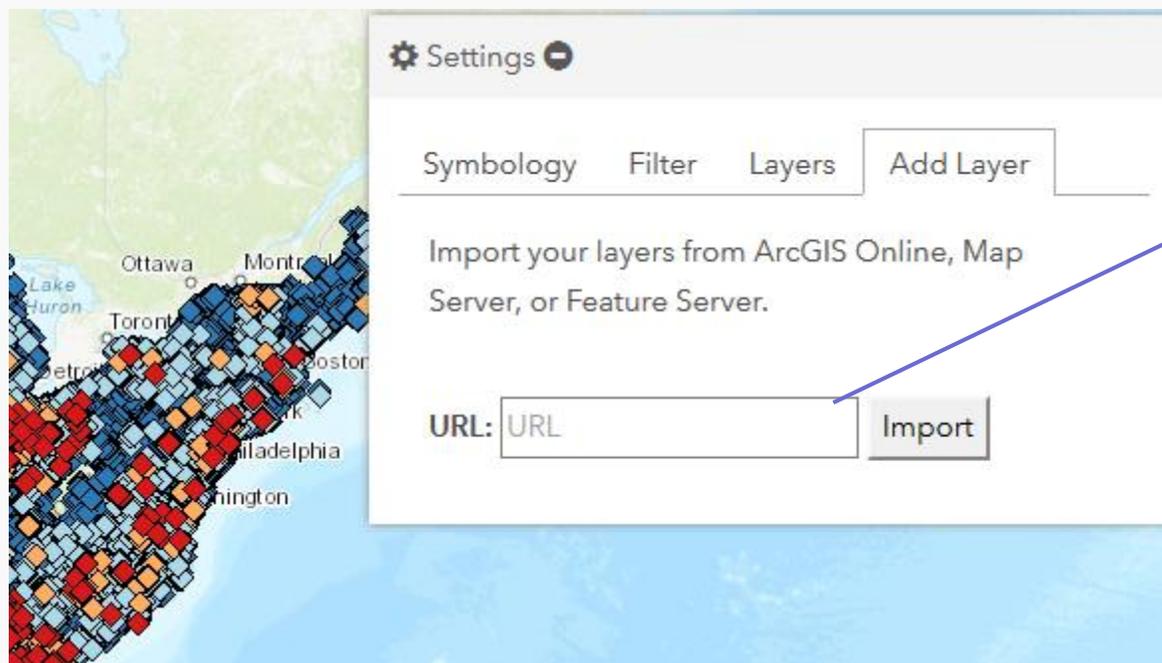
\*To view these layers, you must be zoomed in

# Using the Tool: Filter Options



- Geographic
  - State County
  - EPA Region
  - Ecoregion: I-XIV
  - Water Body Type: River/Stream or Lake/Reservoir
- Station Category:
  - High Concern, Concern, Possible Concern, No Concern
- Number of Samples
- Hydrologic
  - HUC-8 Subbasin

# Using the Tool: Adding a Map Layer



Import your own map or map layer, by adding the service URL in the Add Layer Tab