Water Quality Indicators (WQI) Tool
Version 2.5
View, Focus, and Screen Ambient Monitoring Data

https://echo.epa.gov/maps/wqimap
Concern Focusing Solely on Impaired Waters

- 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

Gather Monitoring Data
- US Water Quality Portals Last 10 years
- Currently only nutrient data
- Pathogen data being incorporated

Normalize Monitoring Data
- QA/QC data
- Combine subspecies of nitrogen
- Calculate representative statistic

Visualize Data
- Compared to WQ Criteria
- Additional data layers for context

Other important steps:
- Only measurements reported as total phosphorus are used.
- Identifying and considering non-detects – currently substituting ½ detection limit
- Identifying and averaging duplicate samples
- Identifying and validating ambiguously reported data
- Identifying and rejecting poorly reported data (e.g. missing units)
Data Sources & Map Services Utilized

- **National Water Quality Monitoring Council** – Water Quality Portal
  - EPA’s STOrage and RETrieval Data Warehouse (**STORET**)
  - USGS National Water Information System (**NWIS**)
  - USDA Sustaining The Earth’s Watersheds – Agricultural Research Database System (**STEWARDS**)

- **CWA 304(a) National Criteria**
  - Aggregate Nutrient Ecoregional (**ANE**)


- **EPA Enforcement and Compliance History Online (ECHO)** – permitted facility map services

- **National Hydrography Dataset Plus** (**NHDPlus**)

- **National Land Cover Database** (**NLCD**)

- **Chesapeake Bay Land Cover** – Chesapeake Bay Conservancy
Version 2.5 New Features

• Map Service Moved to Cloud Server
• Data Outside of CON-US Now Available
• Upstream Discharger Pollutant Search
  – Find upstream facilities permitted to discharge selected pollutant
• Add Your Own Map Layer
• Quarterly Data Refresh
Use Cases

• NPDES Inspection Planning
• NPDES Permitting
• Water Monitoring
• Nutrient Trading

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
• Release of Alternate Data Format (Summer 2019)
  – WQI dataset is publicly available here: https://echo.epa.gov/tools/data-downloads/wqi-data-review
• Pollutant Expansion
  – Pathogens – e. coli, enterococci, fecal coliforms
  – Lead
• Enhanced Searching
  – Between monitoring locations – ‘Upstream Downstream’ Analysis
  – Between NPDES facilities
Accessing the WQI Tool & WQI Dataset

• Go to: https://echo.epa.gov/maps/wqimap
  – You will be asked to log into ECHO Gov with your Lan ID and password.
  – ECHO Gov access is available to federal, state, and tribal partners.
  – Register here: https://echo.epa.gov/user/register

• Technical Documentation (publicly available)

• Download the dataset (publicly available)
  – File will be updated each refresh
  – File Name: ResultFileToEnd2OutputYYYYMMDD#####.csv.gz
  – https://echo.epa.gov/files/echodownloads/Data-Analytics/WQI/
Questions, Comments & Feedback?

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- 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

- **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
Using the Tool: Search for Upstream Facilities

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

- Set criteria and breakpoints either globally or by Ecoregion
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 \( \text{①} \) 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