



Chesapeake Bay Program
A Watershed Partnership

Impaired Waters of the Chesapeake Bay Watershed

Interactive Web Application

Chris Wright
U.S. Geological Survey

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Introduction

- **States required to perform water quality assessments per Clean Water Act**
 - Integrated Water Quality Assessment Reports
- **Geospatial Data available via public websites**
 - Requires GIS software/knowledge
 - Different states have different data reporting processes and needs
 - This makes visualizing large geographic areas difficult
- **Interactive web app**
 - enables interested parties to inventory, visualize, and disseminate this data more easily
 - Increases ease of communication

Methods

- 1. Download data from the state's publicly accessible websites.
- 2. Clip data to the Chesapeake Bay Watershed boundary.
- 3. Export Attribute table as text file and import into excel using various delimiters (, - ; etc.) depending on what was used in the dataset.
- 4. Use Advanced Filter Function to identify all unique values within the pertinent "cause" attribute.
- 5. Using this list, Select by Attribute Tool you can use the LIKE '% (UNIQUE VALUE) %' command to query the attribute list to find any entry that contains the unique value. ¹
- 6. Create layer from the selected entries from each state's data layers so that each unique attribute in a dataset would generate a separate layer
- 7. Group the layers by the Parent Cause Names used in the EPA ATTAINS database
- 8. Sort into Toxic Contaminant, Non-Toxic Contaminant, and Cause Unknown Groups

¹ Maryland provides layers divided by cause of impairment - no querying or identifying of unique values was performed on this data. Maryland also includes Category 2 waters (Waters of Concern but not impaired) in their data. These values are currently still in the app and will be removed prior to any sort of release to ensure continuity of data representation.

Data Inventory

Local Jurisdiction	Data Divisions	Data link	Date Accessed	Current year Available
Delaware		http://www.dnrec.delaware.gov/Info/Pages/GISData.aspx	Data expected approximately 7/1/2016	2014 (No GIS data Link)
Maryland		http://www.mde.state.md.us/programs/Water/TMDL/Integrated303dReports/Pages/ImpairmentMaps.aspx	6/1/2016	2014
	River	" "		
	Tidal Waters	" "		
	Tidal Water Points	" "		
	Impoundments	" "		
New York		http://www.dec.ny.gov/chemical/31290.html	6/8/2016	GIS data not available
Pennsylvania			6/2/2016	2014 (dated with release date of 2016)
	Riverine	http://www.pasda.psu.edu/uci/DataSummary.aspx?dataset=888		
	Lakes	http://www.pasda.psu.edu/uci/DataSummary.aspx?dataset=1087		2014 Data available but cause is coded by number and not apparent.
Virginia		http://www.deq.virginia.gov/Programs/Water/WaterQualityInformationTMDLs/WaterQualityAssessments/2012305(b)303(d)IntegratedReport.aspx	5/30/2016	2012
	Riverine	" "	6/13/2016	2014
	Estuarine	" "		
	Reservoir	" "		
Washington DC	Integrated	https://iaspub.epa.gov/waters10/attains_impaired_waters.impaired_waters_list?p_state=DC&p_cycle=2014	6/9/2016	2014
West Virginia	Integrated	http://www.dep.wv.gov/WWE/watershed/IR/Pages/303d_305b.aspx	5/30/2016	2012 (2014 Draft)

Organization –

EPA Cause Parent Names

Group	Parent Name
Non-Toxic Contaminant Impairments	
	Temperature (1035)
	Nutrients (792)
	Pathogens (861)
	Algal Growth (99)
	Trash (1092)
	Sediments (974)
	Habitat/Flow Alterations (586/545)
	Organic Enrichment/Oxygen Depletion (1189)
	Turbidity/TSS (1110)
	Noxious Aquatic Plants (Macrophytes)
Toxic Contaminant Impairments	
	pH/Acidity/Caustic Conditions (1188)
	Polychlorinated Biphenyls (PCBs) (918)
	Metals (Other than Mercury) (706)
	Ammonia (122)
	Oil and Grease (811)
	Total Toxics (1071)
	Mercury (693)
	Pesticides (885)
	Salinity/Total Dissolved Solids/Chlorides/Sulfates (966)
	Toxic Organics (1080)
	Cyanide
	PA Chlorine 2014
Cause Unknown - Impaired Biota (247/251)	

Unique Cause Values

Virginia

VA Estuaries 2014	VA Reservoirs 2014	VA Rivers 2014
Aquatic Plants (Macrophytes)	Benzo(a)pyrene (PAHs)	Aldrin
Benzo[k]fluoranthene	Benzo[b]fluoranthene	Ammonia (Un-ionized)
		Benthic-Macroinvertebrate
Chlordane	Benzo[k]fluoranthene	Bioassessments
Chloride	Cadmium	Benzo(a)pyrene (PAHs)
Chlorophyll-a	Chlorophyll-a	Benzo[b]fluoranthene
Dioxin (including 2, 3, 7, 8-TCDD)	Copper	Benzo[k]fluoranthene
Dissolved Oxygen	Dissolved Oxygen	Cadmium
Enterococcus	Escherichia coli	Chlordane
Escherichia coli	Mercury in Fish Tissue	Copper
Estuarine Bioassessments	PCB in Fish Tissue	DDE
Fecal Coliform	PCB in Water Column	DDT
Mercury in Fish Tissue	pH	Dissolved Oxygen
NA	Phosphorus (Total)	Escherichia coli
Nutrient/Eutrophication		
Biological Indicators	Temperature	Fecal Coliform
PCB in Fish Tissue	Zinc	Heptachlor epoxide
PCB in Water Column		Mercury in Fish Tissue
pH		Mirex
Sediment Bioassays for Estuarine and Marine Water		PCB in Fish Tissue
		PCB in Water Column
		pH
		Temperature
		Zinc

West Virginia

WV Cause Values

Aluminum
 Aluminum (trout)
 Ammonia
 Bio
 CNA-Algae
 Fecal/Bacteria
 Iron
 Iron (trout)
 Nitrite
 Nitrite (trout)
 PCBs
 pH
 Temperature, water

Pennsylvania

PA River Cause Values

Cause Unknown
 Chlorine
 DO/BOD
 Excessive Algal Growth
 Filling and Draining
 Flow Alterations
 Mercury
 Metals
 Nonpriority Organics
 Nutrients
 Oil and Grease
 Organic Enrichment/Low D.O.
 Other Habitat Alterations
 Other Inorganics (Sulfates, etc.)
 Pathogens
 PCB
 pH
 Priority Organics
 Siltation
 Suspended Solids
 TDS
 Thermal Modifications
 Turbidity
 Unionized Ammonia
 Unknown Toxicity
 Water/Flow Variability

Unique Cause Values cont.

Maryland

MD Cause Values

Aluminum
Ammonia
Arsenic
Bacteria
BOD
BOD_Carb
BOD_Nit
Cadmium
Cause Unknown
Channelization
Chloryrifos
ChlordaneANDChlordaneSed
Chloride
Chromium
Copper
Cyanide
Debris
Heptachlor Epoxide
Iron
Lack of Riparian Buffer
Lead
Manganese
Mercury
Nickel
Nitrogen
Oil
PCB
pH
Phosphorus
Sediments
Selenium
Silver
Sulfates
Temperature
Toxics
TSS
Zinc

New York

Coming Soon...

D.C.

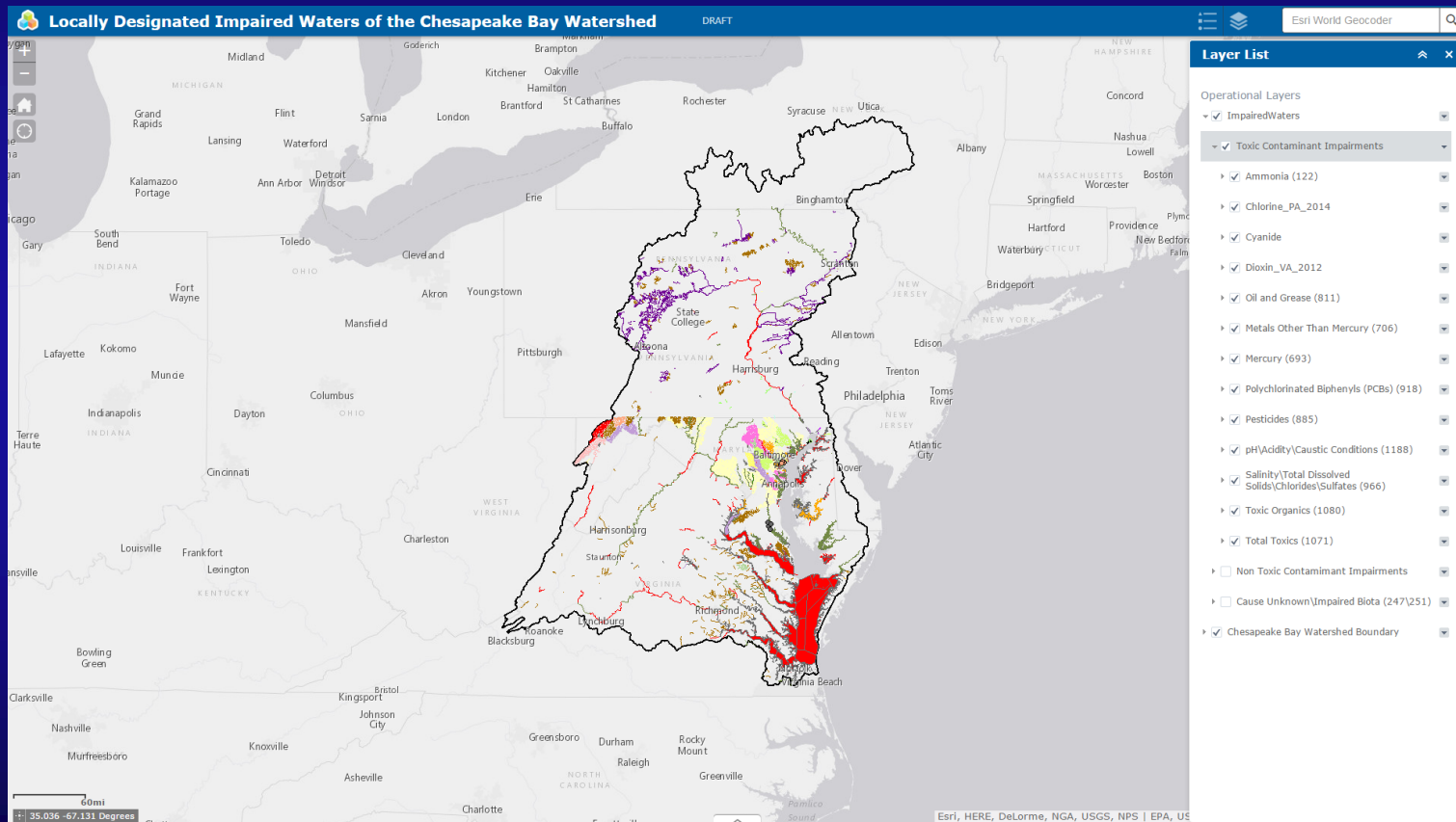
Coming Soon...

Delaware

Coming Soon...

Product

- <http://gis.chesapeakebay.net/draftimpairedwaters/app.html>



Potential Uses

- **Toxic Contaminant Workgroup**
 - Enable workgroup to make strategic decisions on work plan activities and generally raise awareness on the extent of toxics-related impairments.
- **Internal Cross-GIT Map Project**
 - Help direct, focus, and coordinate interventions across the Goal Teams
- **Landscape based risk analysis**
 - Example – PAHs wide spread use but only localized impairments.
 - Based on similar land use in other areas, are there other areas of potential impairments that are not being monitored?
- **Public Outreach tool**
 - Enable public to visualize water quality issues
- **Communications tool for local policy makers**
 - Allow local agencies to visualize problem areas
 - Impairments in rivers that cross political boundaries

Next Steps

- **Distribute to Watershed Jurisdictions**
 - Vetting current data
 - New, more current data available?
- **Allow for 4 weeks for comment**
- **Find other interested parties here at CBP**
- **Distribute Final Product**
 - Internally for Toxics Contaminant Workgroup
 - Water Quality GIT, Habitat GIT, etc?
 - The public at large

Feedback

■ ?