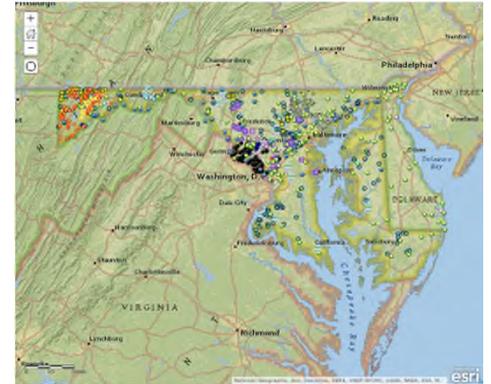


# Maryland's Approach to Reviewing and Assessing Monitoring Programs



2014 National Water Monitoring Conference  
Cincinnati, Ohio  
May 1, 2014

Dan Boward  
Maryland Department of Natural Resources



# Points to Cover

- Program Review and Assessment
- Role of *Maryland Water Monitoring Council*
- Standardizing Methods and Data Sharing

# Two State Agencies

- Dept. of the Environment

- Water Quality Standards
- 303(d) list
- TMDLs
- Human health advisories
- Targeted monitoring (primarily chemical)
- ***Statewide Monitoring Strategy***



- Dept. of Natural Resources

- Commercial/recreational fisheries
- Land/water preservation and restoration programs
- RTE listings
- Liaison with locals and NGOs
- Ambient/probabilistic monitoring (primarily biological)
- ***Maryland Water Monitoring Council***



# Maryland Comprehensive Water Monitoring Strategy

- Every 5 years
- Describes programs and plans for refinements
- Rivers, streams, lakes, tidal waters, wetlands, groundwater
- Provides plan for restructuring



**Table 2: Strategic Overview of Maryland's Monitoring Programs**

Designated Uses & Anti-Degradation					Other Key Monitoring Functions					
A Aquatic Life	B Drinking Water	C Water Contact	D Fishing	E Antideg. and Protection	F Long- term Trends	G Implementation Effectiveness	H Source ID & TMDL Develop	I Compliance	J Reactive	K Water Quality Standard R & D
<i>Non-tidal Rivers &amp; Streams</i>										
<ul style="list-style-type: none"> <li>•MBSS</li> <li>•Core/ Trend</li> <li>• Invasive species</li> <li>•Volunteer</li> </ul>	<ul style="list-style-type: none"> <li>•Local Delegation</li> </ul>	<ul style="list-style-type: none"> <li>•Under Developmnt</li> </ul>	<ul style="list-style-type: none"> <li>•Fish Tissue</li> <li>•DNR Fisheries</li> </ul>	<ul style="list-style-type: none"> <li>•MBSS</li> </ul>	<ul style="list-style-type: none"> <li>•Core/ Trend</li> <li>•MBSS</li> </ul>	<ul style="list-style-type: none"> <li>•319 NPS</li> <li>•MBSS</li> <li>•Synoptic Surveys</li> <li>•Local Programs</li> <li>•2010 TFE</li> </ul>	<ul style="list-style-type: none"> <li>•MBSS</li> <li>•TMDL</li> <li>•Synoptic Surveys</li> <li>•Corbicula Surveys</li> </ul>	<ul style="list-style-type: none"> <li>•NPDES</li> <li>•MS4</li> <li>•Bureau of Mines</li> </ul>	<ul style="list-style-type: none"> <li>•Fish Kill</li> <li>•Emergency Response</li> <li>•HAB Monitoring</li> </ul>	<ul style="list-style-type: none"> <li>•MBSS</li> <li>•Nutrient Criteria</li> <li>•Temp.</li> </ul>
<i>Lakes and Reservoirs</i>										
<ul style="list-style-type: none"> <li>•Nat'l Lake Survey</li> </ul>	<ul style="list-style-type: none"> <li>•Reservoir Source Water Assessment</li> </ul>	<ul style="list-style-type: none"> <li>•Beaches Program</li> </ul>	<ul style="list-style-type: none"> <li>•Fish Tissue</li> </ul>	<ul style="list-style-type: none"> <li>•N/A</li> </ul>	<ul style="list-style-type: none"> <li>•Nat'l Lake Survey</li> </ul>	<ul style="list-style-type: none"> <li>•319 NPS</li> <li>•Local Delegation</li> <li>•MS4 Permits</li> </ul>	<ul style="list-style-type: none"> <li>•TMDL</li> <li>•319 NPS</li> </ul>	<ul style="list-style-type: none"> <li>•NPDES</li> <li>•MS4</li> </ul>	<ul style="list-style-type: none"> <li>•Fish Kill</li> <li>•Emergency Response</li> <li>•HAB Monitoring</li> </ul>	<ul style="list-style-type: none"> <li>•Nat'l Lake Survey</li> </ul>
<i>Chesapeake and Coastal Bays</i>										
<ul style="list-style-type: none"> <li>•Ches. Bay Program</li> <li>•DNR Bay Mon.</li> </ul>	<ul style="list-style-type: none"> <li>•N/A</li> </ul>	<ul style="list-style-type: none"> <li>•HAB Mon.</li> <li>•Beaches Program</li> </ul>	<ul style="list-style-type: none"> <li>•Shellfish</li> <li>•Fish Tissue</li> <li>•DNR Fisheries</li> </ul>	<ul style="list-style-type: none"> <li>•Ches. Bay Program</li> <li>•DNR Bay Monitoring</li> </ul>	<ul style="list-style-type: none"> <li>•Ches. Bay Program DNR Bay Monitoring</li> </ul>	<ul style="list-style-type: none"> <li>•Ches. Bay Program</li> <li>•Shellfish</li> <li>•BST</li> <li>•2010 TFE</li> </ul>	<ul style="list-style-type: none"> <li>•TMDL</li> <li>•319 NPS</li> </ul>	<ul style="list-style-type: none"> <li>•NPDES</li> <li>•WQC &amp; Wetland License</li> </ul>	<ul style="list-style-type: none"> <li>•HAB Monitoring</li> <li>•Fish Kill</li> </ul>	<ul style="list-style-type: none"> <li>•Complete for Ches. Bay</li> </ul>
<i>Groundwater</i>										
<ul style="list-style-type: none"> <li>•N/A</li> </ul>	<ul style="list-style-type: none"> <li>•Source Water Assessment</li> <li>•Wellhead Protection</li> </ul>	<ul style="list-style-type: none"> <li>•N/A</li> </ul>	<ul style="list-style-type: none"> <li>•N/A</li> </ul>	<ul style="list-style-type: none"> <li>•Wellhead Protection</li> </ul>	<ul style="list-style-type: none"> <li>•Wellhead Protection</li> </ul>	<ul style="list-style-type: none"> <li>•N/A</li> </ul>	<ul style="list-style-type: none"> <li>•319 NPS</li> </ul>	<ul style="list-style-type: none"> <li>•Source Water Assessment</li> </ul>	<ul style="list-style-type: none"> <li>•Emergency Response</li> <li>•Oil Control Program</li> </ul>	<ul style="list-style-type: none"> <li>•Fed. Delegation</li> </ul>
<i>Wetlands</i>										
<ul style="list-style-type: none"> <li>•Under Developm ent</li> </ul>	<ul style="list-style-type: none"> <li>•N/A</li> </ul>	<ul style="list-style-type: none"> <li>•N/A</li> </ul>	<ul style="list-style-type: none"> <li>•N/A</li> </ul>	<ul style="list-style-type: none"> <li>•Wetlands of Special State Concern</li> </ul>	<ul style="list-style-type: none"> <li>•FED. DEL. – Under Development</li> </ul>	<ul style="list-style-type: none"> <li>•319 NPS</li> </ul>	<ul style="list-style-type: none"> <li>•Local</li> </ul>	<ul style="list-style-type: none"> <li>•Wetland Permit &amp; mitigation</li> </ul>	<ul style="list-style-type: none"> <li>•N/A</li> </ul>	<ul style="list-style-type: none"> <li>•Under Developmnt</li> </ul>
<i>Ocean</i>										
<ul style="list-style-type: none"> <li>•N/A</li> </ul>	<ul style="list-style-type: none"> <li>•N/A</li> </ul>	<ul style="list-style-type: none"> <li>•Beaches Program</li> </ul>	<ul style="list-style-type: none"> <li>•DNR Fisheries</li> <li>•HAB</li> <li>•Fish Tissue</li> </ul>	<ul style="list-style-type: none"> <li>•N/A</li> </ul>	<ul style="list-style-type: none"> <li>•Beaches Program</li> </ul>	<ul style="list-style-type: none"> <li>•N/A</li> </ul>	<ul style="list-style-type: none"> <li>•NA</li> </ul>	<ul style="list-style-type: none"> <li>•NPDES</li> <li>•WQC &amp; Wetlands License</li> </ul>	<ul style="list-style-type: none"> <li>•Fish Kill</li> <li>•HAB Monitoring</li> </ul>	<ul style="list-style-type: none"> <li>•Fed. Del. - National Coastal Survey</li> </ul>



**Table 3: Organizations/Programs that submitted water quality data for consideration in the 2014 IR.**

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Data Provider	Data Description	Parameter(s) Measured	Data Tier	Notes
Versar Inc. provided data on behalf of Frederick County	Non-tidal biological data	Benthic index of biological integrity	1	Data integrated with MBESS data for biological assessment
Montgomery County Department of Environmental Protection	Non-tidal Biological Data	Benthic index of biological integrity, fish index of biological integrity, habitat	1	Data could not be used for the 2014 IR because it is assessed using non-state reference conditions and metrics. More analysis required to allow comparability.
Baltimore County Dept. of Environmental Protection & Sustainability	Bacteria data for non-tidal watersheds Jones Falls, Gwynns Falls, and Herring Run	E. coli	1	Data used to update bacteria assessments for select watersheds
Nanticoke River Watershed Alliance	Collected tidal and non-tidal water quality data throughout the Nanticoke watershed.	DO, water temperature, saturation, salinity, fecal coliform.	1	Not currently used. Data needs to be integrated with Chesapeake Bay Program Interpolator in order to be used. This will be future priority.
South River Federation	D.O. profiles and supporting info from stations in South River	DO, pH, salinity, conductivity, water temperature, chlorophyll a, secchi depth	1	Data used to update the DO/nutrient assessment for the South River.
National Park Service	Physical and chemical water quality data from Catoctin Mountain Park	DO, pH, water temperature, turbidity	2	Data not incorporated in 2014 IR. Need station coordinates. More coordination anticipated in future.
MDE - Mining Program	Physical water quality data and biological data	DO, temperature, benthic and fish indices of biotic integrity.	1	Biological data collected at targeted sites, not appropriate for probabilistic assessment. Data used for Tier II high quality waters evaluation instead.
MDE - Compliance Program's Sewage Overflow Database	Web-accessible Sewage Overflow Database provides data on location and volume of sewage overflows	gallons of untreated sewage discharged from leaking infrastructure	1	Data used to inform bacteria assessments for areas with little or no water quality data



# Maryland Water Monitoring Council

- 20<sup>th</sup> Year!
- The Three Cs (Communication, Collaboration, Coordination)
- 21 Member Board (Fed., State, Local, Academia, Business, NGO)
- Annual Conference, Workshops, Website, Facebook
- Streams Roundtable



# Who is Monitoring Water in Maryland?

Maryland Dept. of the Environment, Maryland DNR, Anne Arundel Co., Baltimore City, Baltimore Co., Carroll Co., Frederick Co., Harford Co., Howard Co., Montgomery Co., Prince Georges Co., Biohabitats, Chesapeake Environmental Mgmt., Coastal Resources, Doss EA Engineering, Engineering, EcoAnalysts, KCI Technologies, Limno Tech, McCormick-Taylor, RK and K, Straughan Environmental, URS, Versar, Tetra Tech, Washington Council of Governments, Maryland National Capital Park and Planning Comm., University of MD., Audubon Naturalists, Isaak Walton League, City of Rockville, State Highways Administration ....and more.....



# Maryland Water Monitoring Council



Annual  
Conference



Hands-on Workshops



7<sup>th</sup> MWMC Streams Roundtable

USGS Water Science Center  
February 27, 2014

Agenda

9:30 – Welcome – USGS

Opening remarks – Dan Eoward and Matt Stover

9:40 – Stream Sampling in 2014 Presentations (\* indicates sample sites to be displayed on statewide map)

**Federal Agencies**

USGS – Charles Walker\*  
USF&WS – Mark Secrist\*

**State Agencies**

MDE

Science Services Admin – Charlie Poukish\*

MD DNR

MBSS – Andy Becker\*  
Marcelus Monitoring Coalition/Stream Waders – Michael Kashivagi\*  
CORE/Trend – Ellen Friedmar\*  
Fisheries Service – Matt Sell\*

10:45 - Break

**Local/Regional Govt. Agencies**

Baltimore County DEPS – Kevin Brittingham\*  
Montgomery County DEP – Ken Mack\*  
MNCPPC – Jai Cole\*  
Balto Co Schools Office of Science – Matt Budinger\*

**Environmental Consultants**

Biohabitats – Mike Thompson  
Versar - Beth Franks\*

**Academia**

UMCES App Lab – Robert Sabo\*  
Baltimore Ecosystem Study – Dan Dillon and Erin Mellenbin

12:00 – Lunch (bring your own [drinks provided] or Subway restaurant within walking distance)

12:30 - Lunch Presentation – Joe Berg – Biohabitats – Stream monitoring to document fundamental change in stream restoration projects

1:00 NGOs/Watershed Groups

Audubon Naturalist Society – Cathy Wiss\*  
Dundalk Renaissance Corp. – Andrea Blomn  
Restore Rock Creek – Allan Straughan  
Blue Water Baltimore – Alice Volpitta  
Mattawoman Watershed Society – Ken Hastings

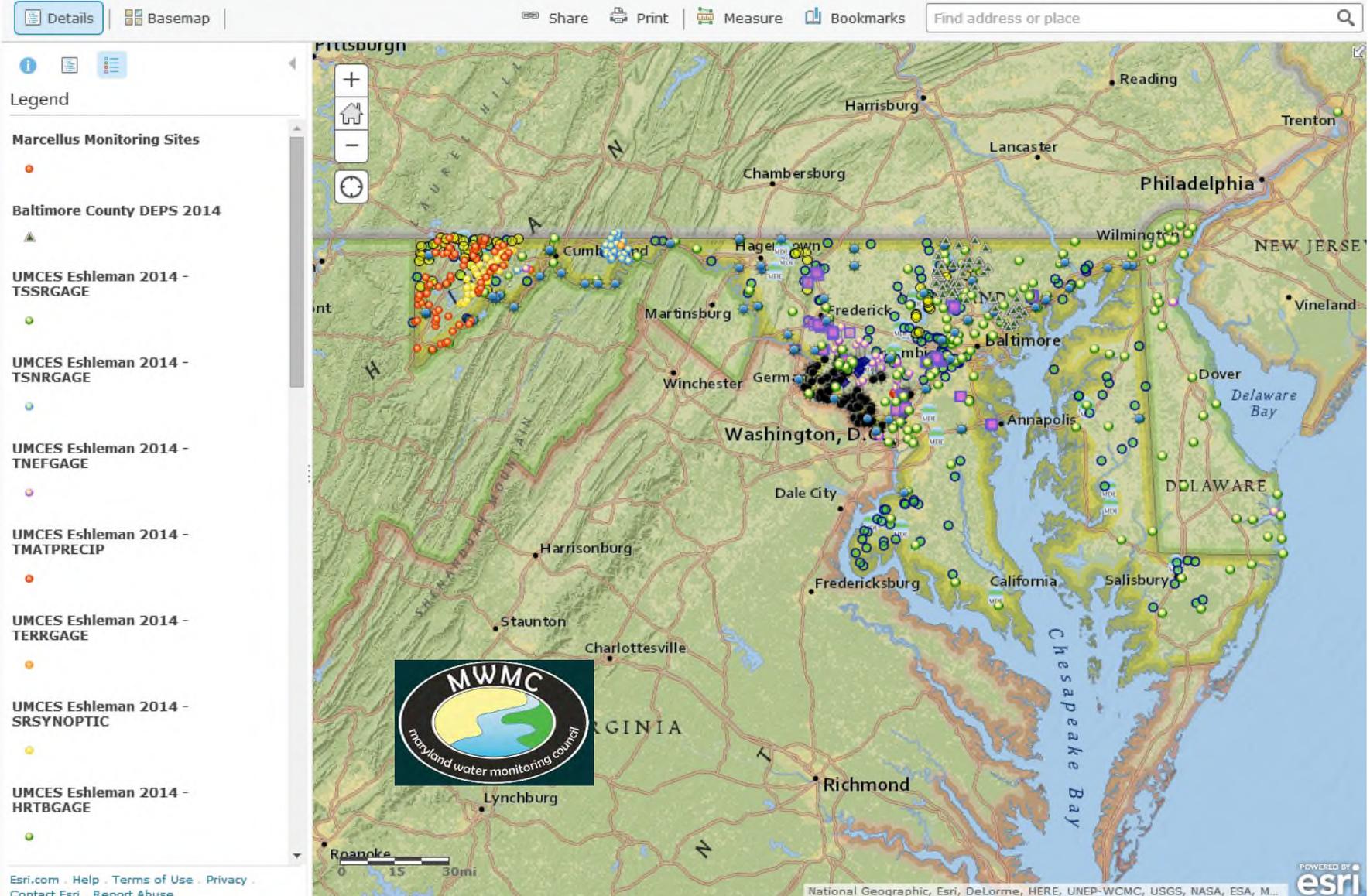
2:00 – Open discussion of statewide map and sampling sites

3:00 - Adjourn

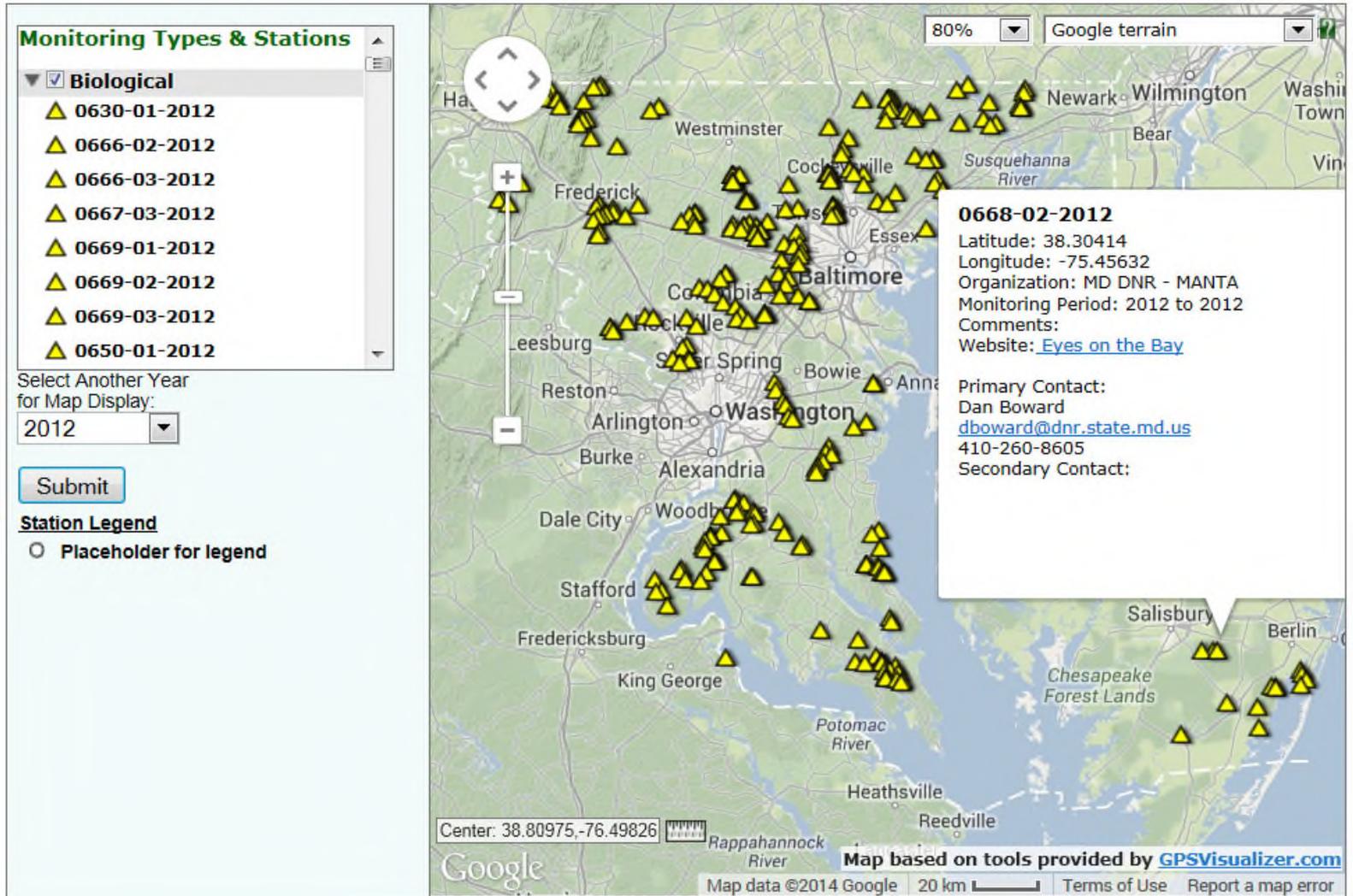
# Stream Monitoring Roundtable Map

ArcGIS - MD Stream Monitoring Roundtable Map-FinalDraft

MODIFY MAP [Sign In](#)



# “Clickable” Site Locator Map





# Maryland Biological Stream Survey

## Stream Sampling Training and Certification



# Data Sharing

- MDE and DNR via WQX/STORET
  - Beaches, Shellfish, Main Ches. Bay, Tidal and Non-tidal Tributaries, Continuous Monitoring, more...
- MDE's mapped Water Quality Standards
- DNR's Stream Health Website





# Smart, Green & Growing Atlas

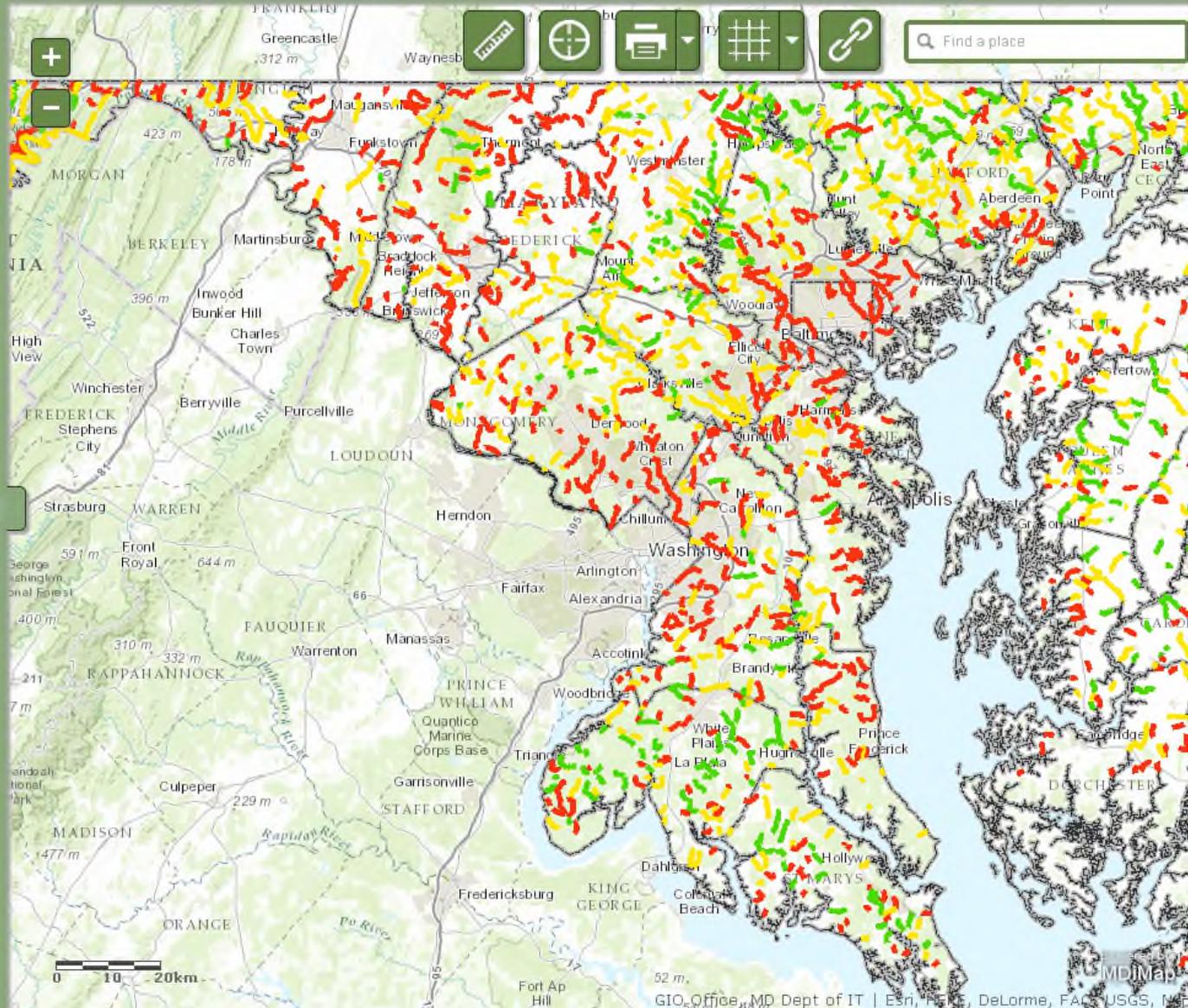
Home

Overview | How To | Contents | Add Data

## Legend



- Public Schools
- Stream Health
  - ▲ Poor
  - ▲ Fair
  - ▲ Good
- Stream Waders sites (volunteer)
  - Poor
  - Fair
  - Good
- MD Biological Stream Survey Sites
- Stream reaches
  - Poor
  - Fair
  - Good
- Counties
- Boundary Outline
- Forest Buffers
- Watershed Health



# Questions?

[dboward@dnr.state.md.us](mailto:dboward@dnr.state.md.us)