



CMC

Chesapeake Monitoring Cooperative

Citizen and Nontraditional Monitoring
ACB CB96334901
Management Board Presentation
June 14, 2018

Agenda

- Memorandum of Understanding
- Chesapeake Monitoring Cooperative review
- Tiered framework
- Data uses/case studies
- Chesapeake Data Explorer
- Chesapeake Bay Agreement Goals and Outcomes
- Questions

CMC program benefits for jurisdictions

Goals, Benefits, Progress

- Supplement coverage (space, time) for the traditional Chesapeake Bay Program water quality monitoring networks and benthic macroinvertebrate assessments.
- Consolidate data of known integrity using a 3-tier filter allowing everyone to have quality assured data for varied assessments.
- Expand environmental stewardship across the watershed.

Chesapeake Monitoring Cooperative

A partnership that aims to provide **technical, logistical, and outreach support** for the integration of volunteer-based and nontraditional water quality and benthic macroinvertebrate monitoring data into the Chesapeake Bay Program (CBP) partnership.

Cooperative Agreement

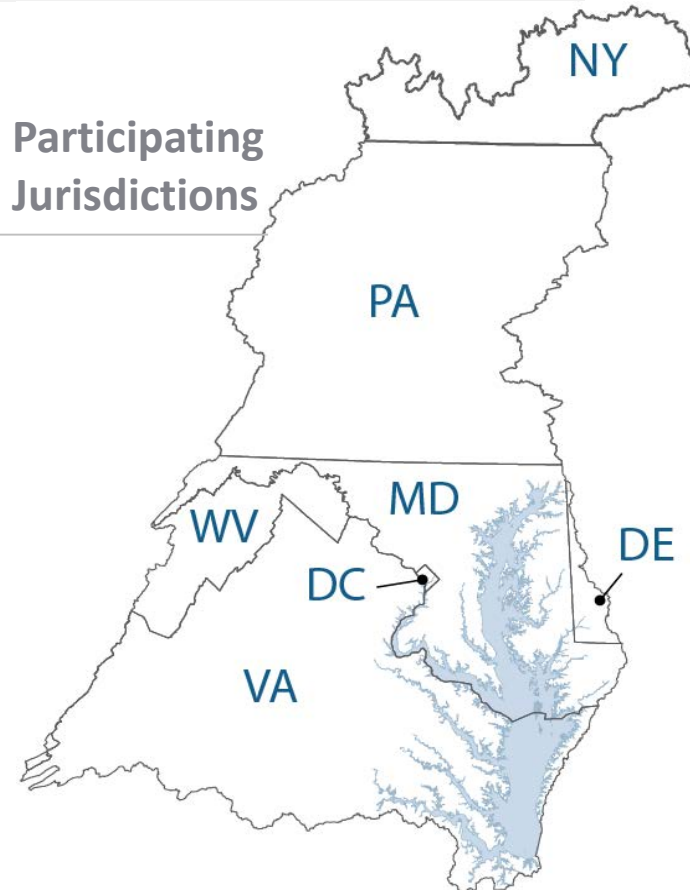


CMC development team partners & service providers



University of Maryland
CENTER FOR ENVIRONMENTAL SCIENCE

Participating Jurisdictions



Memorandum of Understanding

MEMORANDUM OF UNDERSTANDING

AMONG

The State of Delaware, the District of Columbia, the State of Maryland, the State of New York, the Commonwealth of Pennsylvania, the Commonwealth of Virginia, the State of West Virginia, the Interstate Commission on the Potomac River Basin, the Susquehanna River Basin Commission, the Metropolitan Washington Council of Governments, the United States Environmental Protection Agency, the United States Geological Survey, and the Chesapeake Bay Commission.

REGARDING

Using Citizen and Non-traditional Partner Monitoring Data to Assess Water Quality and Living Resource Status and Our Progress Toward Restoration of a Healthy Chesapeake Bay and Watershed

WHEREAS, the health of the Chesapeake Bay and its watershed depends on individual and community-based stewardship by the more than 18 million people who call this watershed home;

WHEREAS, the Chesapeake Bay Program is a leader in leveraging resources through a partnership approach;

WHEREAS, individuals, watershed groups, schools, local governments, and other organizations volunteer their time and talents by participating in environmental monitoring programs; and this *citizen science* represents a unique opportunity for advancing our knowledge while supporting education and community service;

WHEREAS, the cost of monitoring and assessment of tidal and non-tidal waters as well as other ecosystems in the Chesapeake Bay watershed exceeds the capabilities of individual partners and surpasses current funding within the jurisdictions, it is essential that all data sources of known quality be integrated into our monitoring networks;

WHEREAS, data resulting from volunteer and nontraditional partner monitoring, and citizen science efforts can inform impact assessments of local conservation actions as well as decisions that support targeting of management practices that will restore and sustain the health of habitats, living resources and communities across the Bay watershed;

WHEREAS, the Chesapeake Monitoring Cooperative (CMC) has created a framework to facilitate the collection and integration of volunteer and nontraditional partner monitoring efforts into the U.S. Environmental Protection Agency's Chesapeake Bay Program that represents a unique

collaboration and network of monitoring groups across all six states and the District of Columbia;

NOW, THEREFORE, we, the undersigned representatives of the District, state, interstate, and federal entities with responsibility for monitoring the waters and resources of the Chesapeake Bay and its watershed agree that we will:

- Work cooperatively with the CMC and the Chesapeake Bay Program partnership to support and sustain a network of citizen science and non-traditional monitoring partners.
- Work to support an open-access clearinghouse of quality-assured environmental data generated by citizen scientists and nontraditional partners integrate this data into monitoring networks for educational, management, targeting and regulatory assessment applications.
- Promote the collection of water quality, benthic macroinvertebrate, and other monitoring data by non-traditional partners, such as, local and regional organizations, agencies, and/or educational institutions.
- Develop and adopt methods for data integration into regional monitoring and assessment strategies.
- Collaborate with the CMC in training of volunteer and non-traditional partner monitoring efforts.
- Support and actively contribute to the review and implementation of standard protocols and quality assurance programs to produce data of known and documented quality across all seven watershed jurisdictions.

Goal

- Use of data of known quality and the Chesapeake Data Explorer

Tools

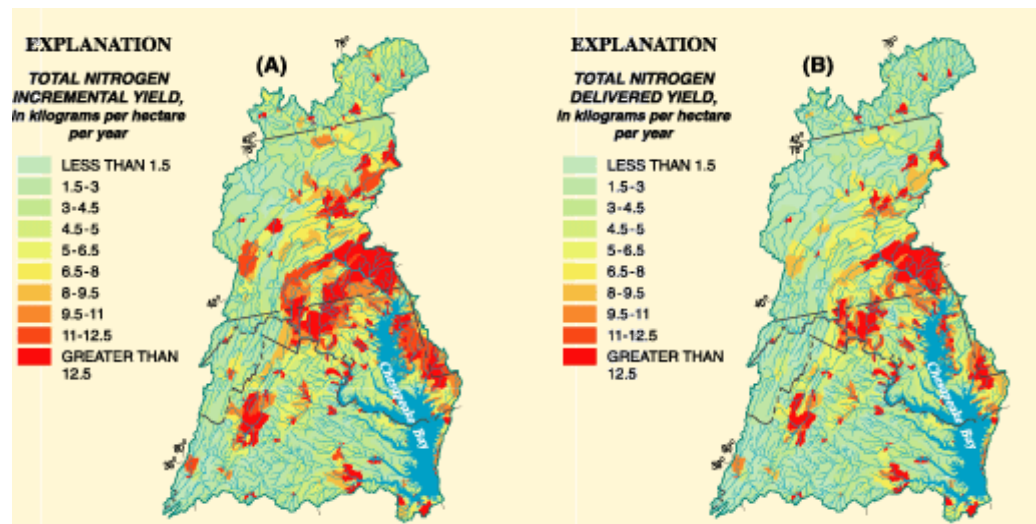
- Tiered framework
- Standardized QAPPs and monitoring protocols
- Training

Expectations for the Management Board

- We request Management Board acceptance of the MOU to move up to the PSC for adoption this autumn.
- Today
 - We look forward to your questions and your input on what else may be needed in the MOU for it to meet your approval.
 - We provide you with two weeks of internal review time before the July meeting.

CMC History

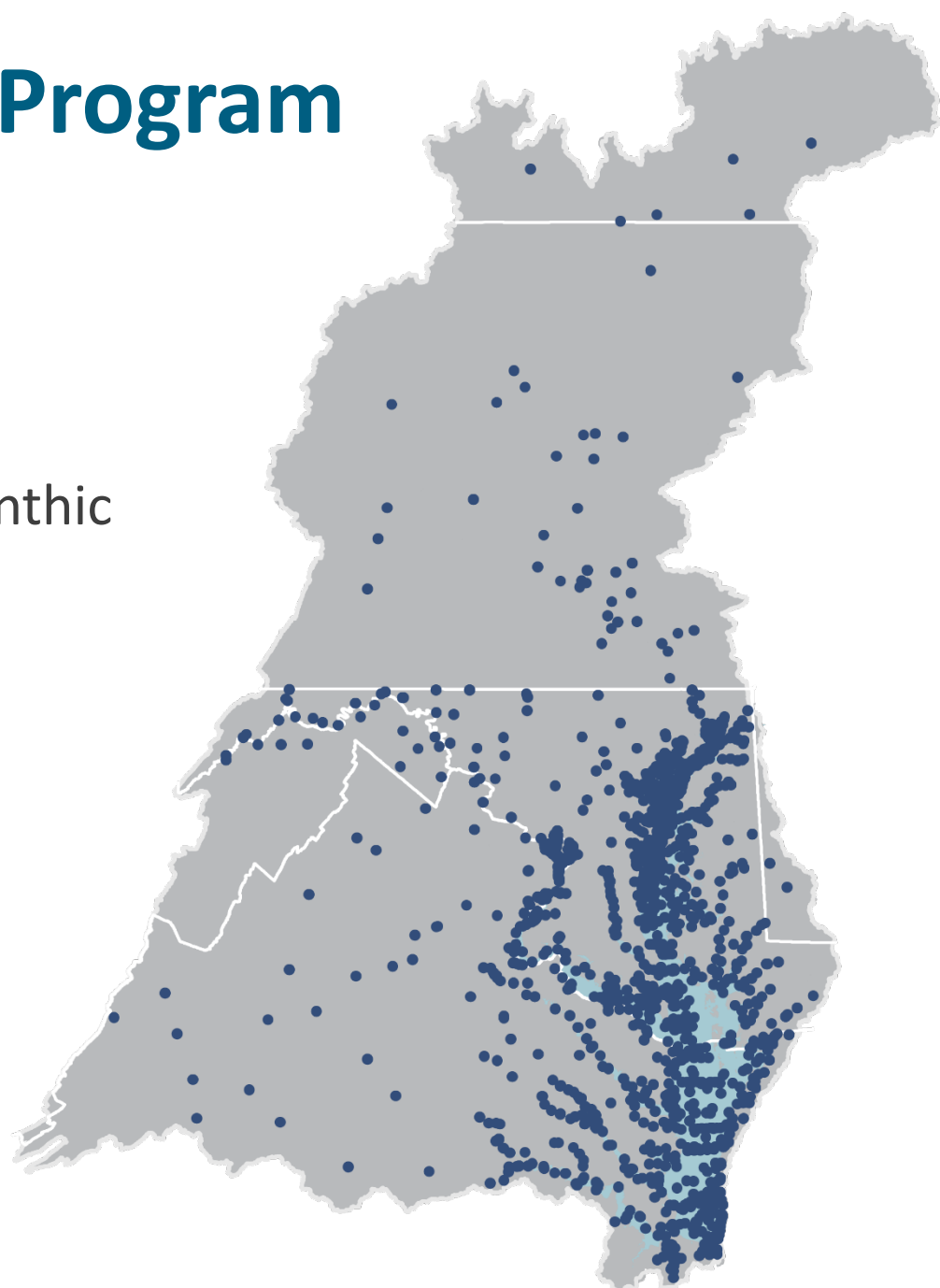
- 2004 MOU formed the non-tidal network
- 2014 US EPA released an RFP with the goal to fill gaps in space and time of existing Chesapeake Bay Program monitoring programs by integrating citizen science and non-traditional monitoring programs.



Chesapeake Bay Program Monitoring Sites

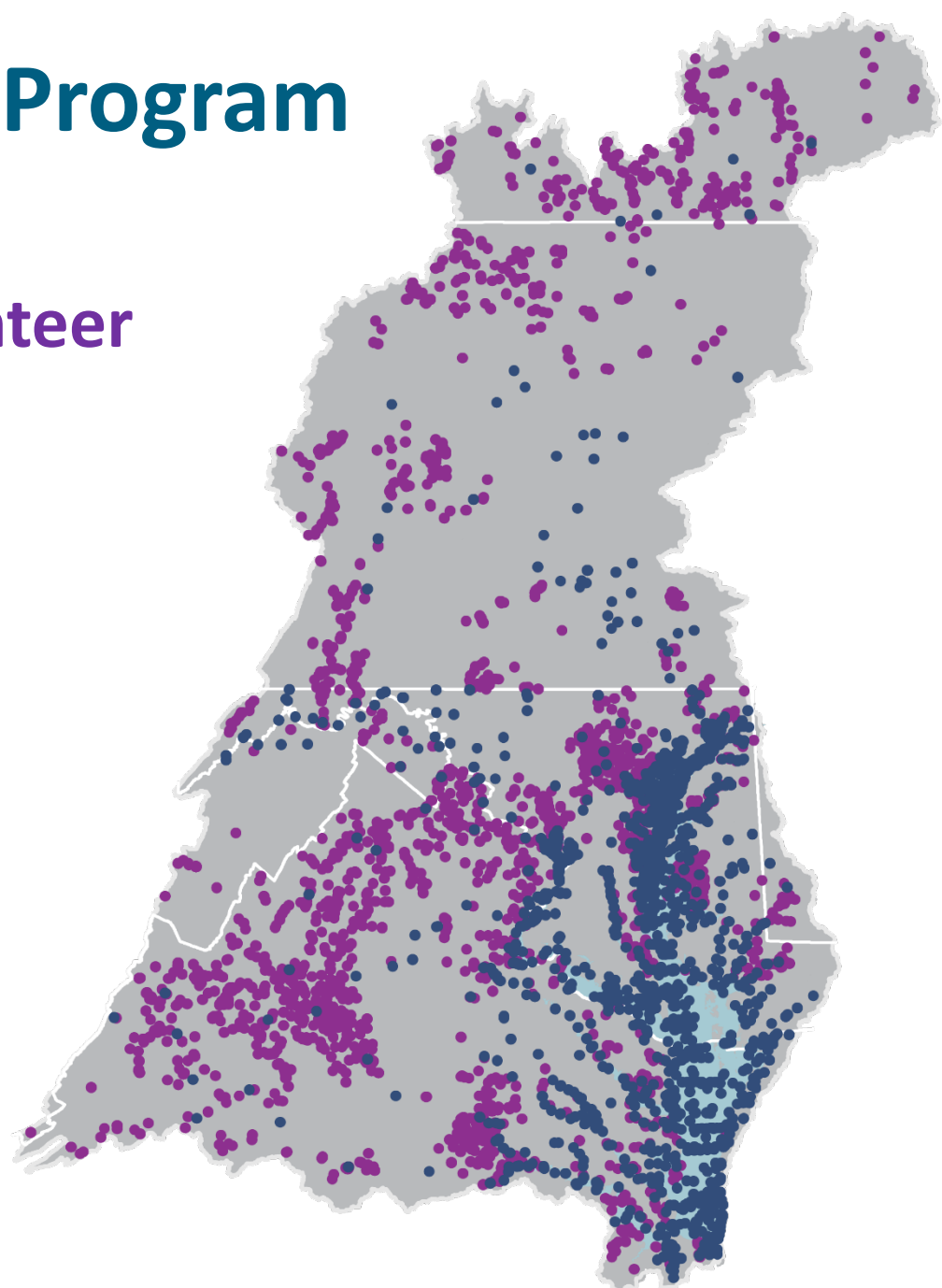
Coverage Includes

- Tidal water quality and benthic sampling sites
- Non-tidal network



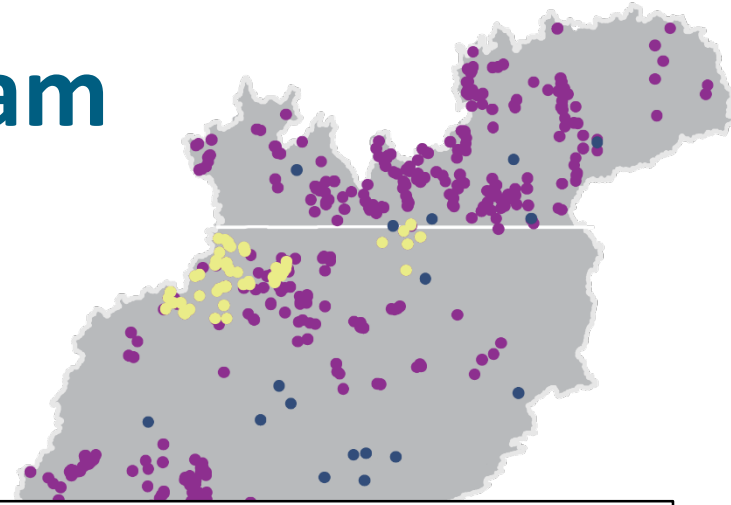
Chesapeake Bay Program Monitoring Sites

Chesapeake Bay Volunteer
and Nontraditional
Monitoring Sites



Chesapeake Bay Program Monitoring Sites

Chesapeake Bay Volunteer
and Nontraditional



1,371 individuals reached

38 training workshops held

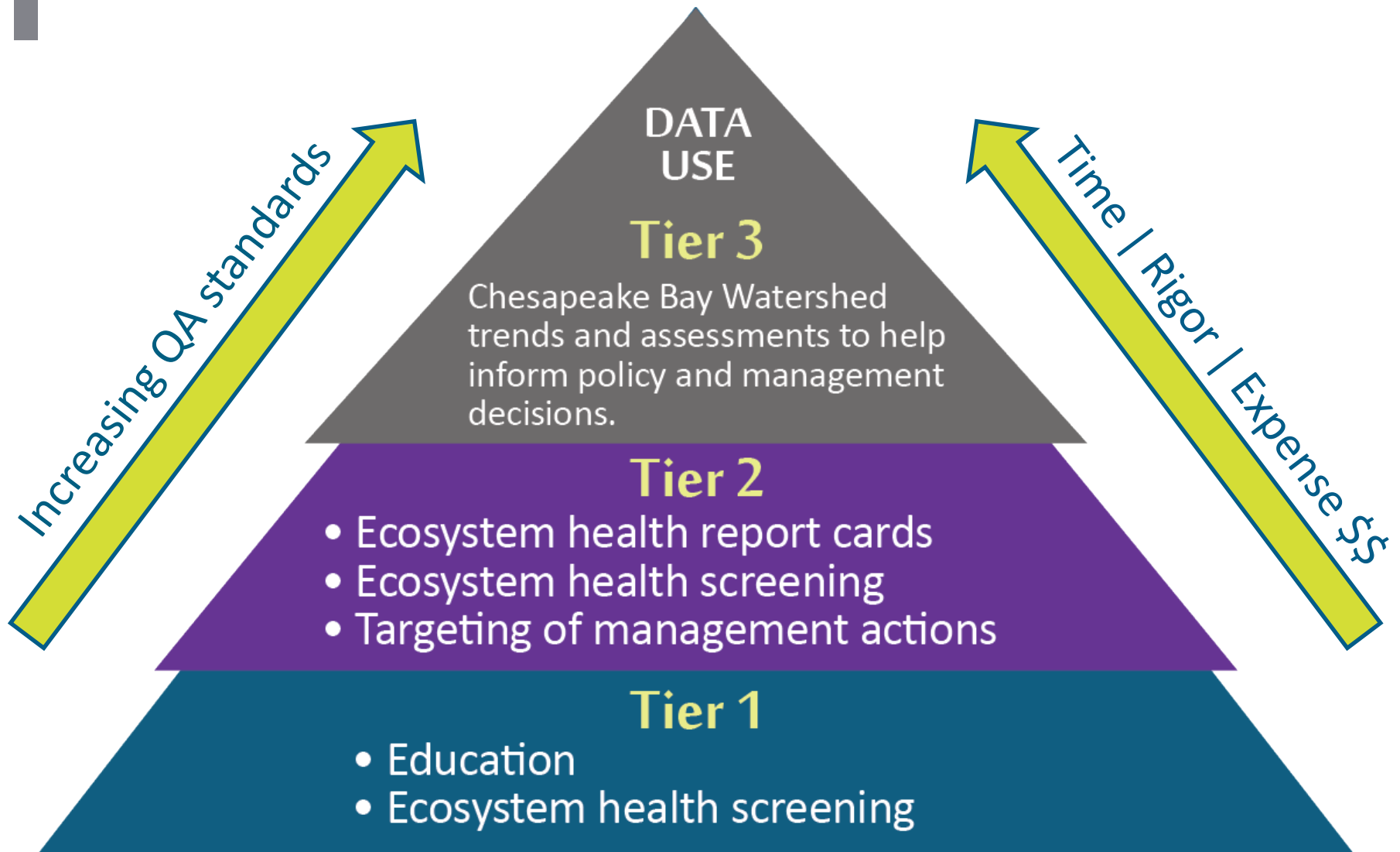
7 groups integrated into the database and uploading data

2 data interpretation workshops held

2 active Tier 3 groups

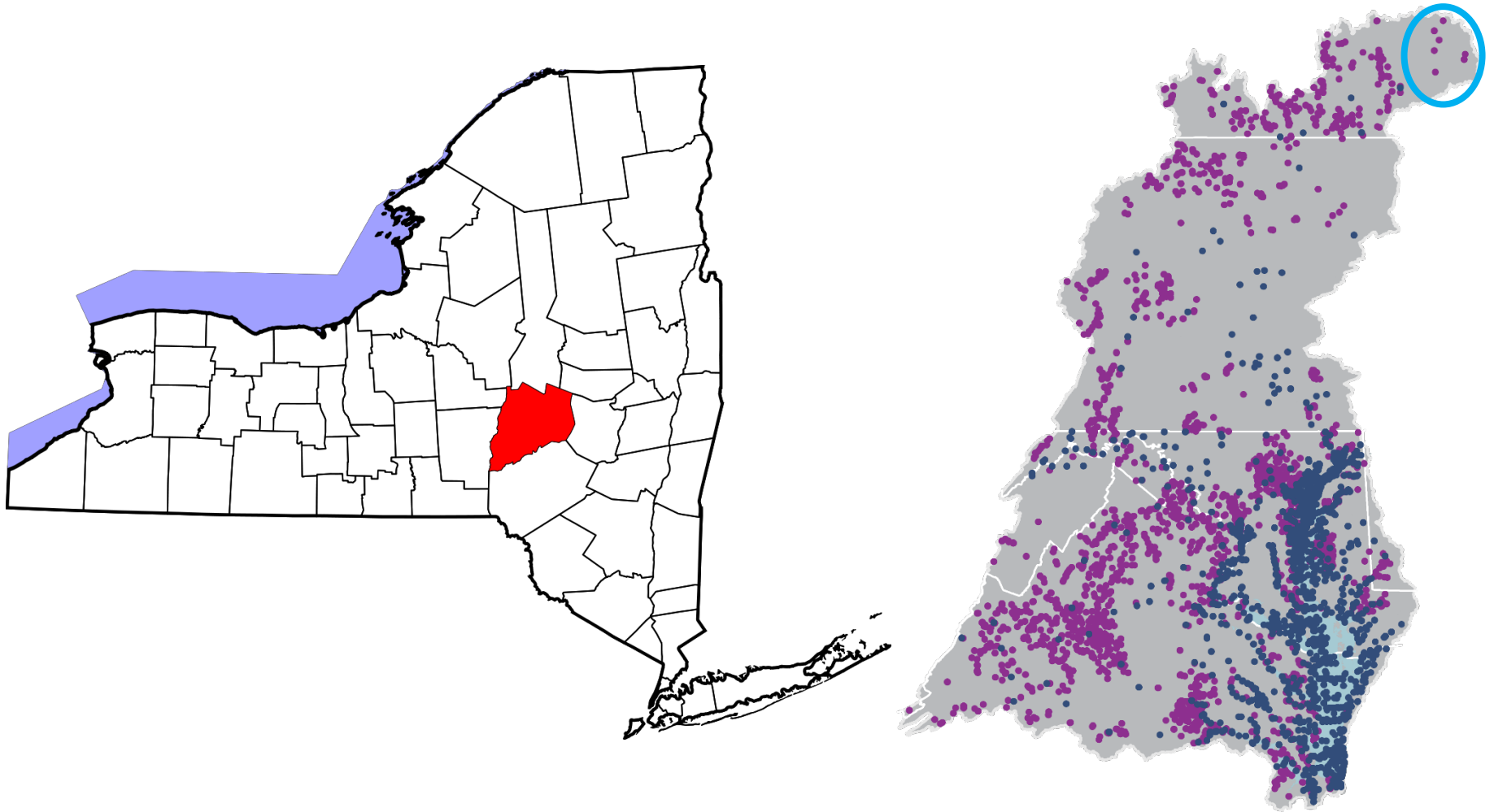
2 additional nominated Tier 3 groups

Tiered Framework



Data Examples

Otsego County Conservation Association

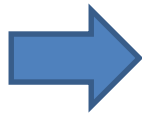


Data Examples

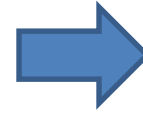
Otsego County Conservation Association



Community Interest



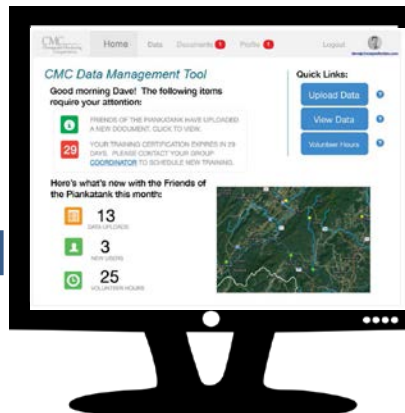
Technical Support
Study Design



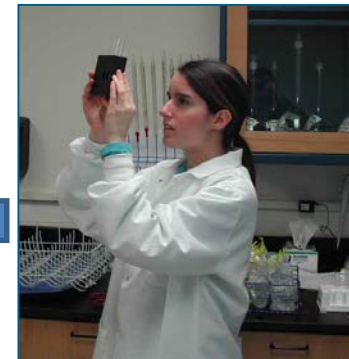
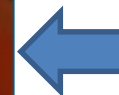
Monitoring trainings



Communities use data to
protect and restore streams



Data interpretation &
Data Integration



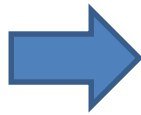
Data collection &
quality verification

Data Examples

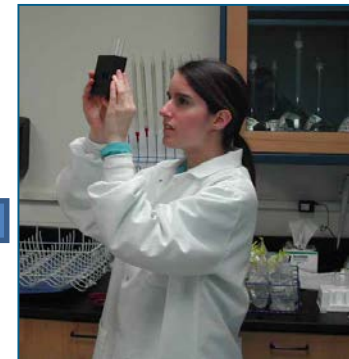
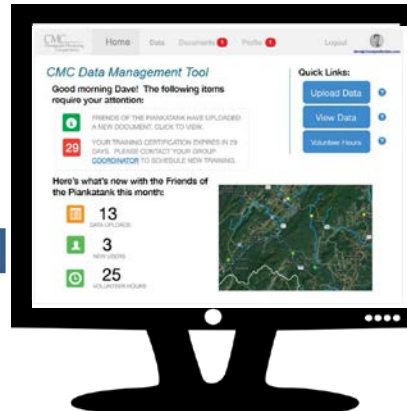
Otsego County Conservation Association



Community Interest



Monitoring trainings



Data collection & quality verification

Data interpretation & Data Integration

Communities use data to protect and restore streams

Data Examples

Otsego County Conservation Association

Monitoring Goals

- Establish a baseline understanding of six watersheds in Otsego County
- Engage community members in monitoring
- Identify sites for potential BMPs and restoration
- Use data locally and support CBP data needs

TIERS	Methodology
1	Macroinvertebrates Nitrate-Nitrogen, Orthophosphate, pH, Water Clarity
2	Conductivity, Dissolved Oxygen, Water Temperature

Data Examples

Otsego County Conservation Association

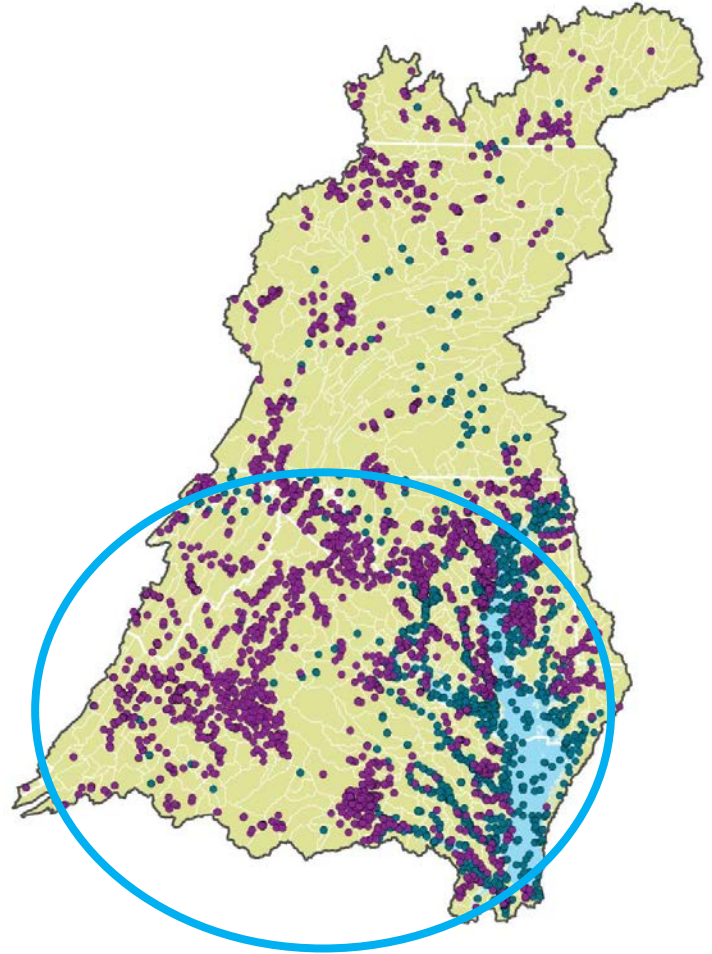
Monitoring Team

- State University of New York (SUNY) Oneonta, Biological Field Station
- Otsego County Soil & Water Conservation District
- SUNY Oneonta
- Butternut Valley Alliance
- Otsego Trout Unlimited Chapter
- 32 volunteer monitors!



Data Examples

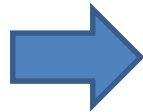
VA Save our Streams



Data Examples

VA Save our Streams

Local Group Interest



Monitoring trainings



Data collection



Quality Assurance &
Data Integration into
Virginia DEQ



DEQ uses data to prioritize
streams

Data Examples

VA Save our Streams

Monitoring Goals

- Get volunteers to be the “eyes and ears” for their stream
- Document changes in stream health over time
- Pass data to DEQ for decision-making

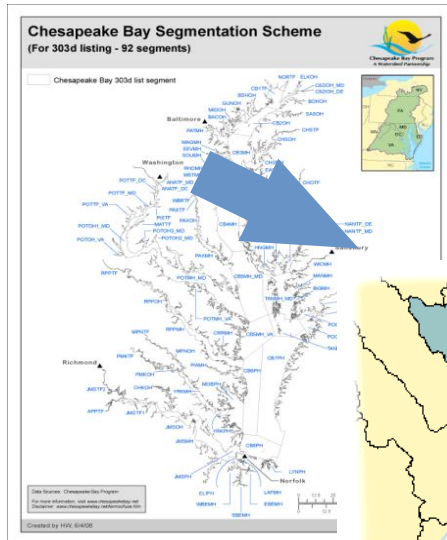
TIERS	Methodology
1	Macroinvertebrates

Data Examples

South River Federation



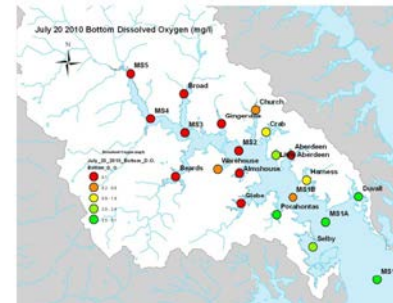
Results comparison shows
better conditions with
21 sites than 1 site



N=1 site
1x/Month

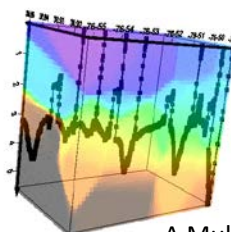
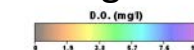


South River Federation

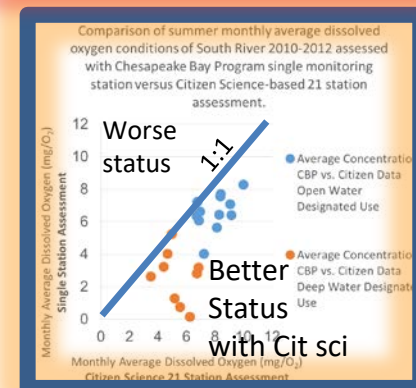


Increasing resolution

Reducing uncertainty



A Muller. USN



Chesapeake Data Explorer

Consolidate Data

Welcome to the Chesapeake Data Explorer!

This is your gateway into data collected by a Chesapeake Basin-wide network of monitors. Use the map below to explore the efforts of our monitoring community



<https://cmc.vims.edu>

Chesapeake Data Explorer

Consolidate Data

Functions

- Data inputs
- Data management
- Data access
- Data visualization

Number of Data Points			
Parameter	Tier 1	Tier 2	Tier 3
Dissolved Oxygen	1086	3969	10
Temperature	1153	3397	6
Salinity	91	0	5

Connecting to Chesapeake Bay Agreement Goals

Bay Agreement Goal	Outcomes
Stewardship Goal	Citizen Stewardship Outcome
Water Quality Goal	<ul style="list-style-type: none">• 2017 WIP Outcome• 2025 WIP Outcome• Water Quality Standards Attainment and Monitoring Outcome
Healthy Watersheds Goal	Healthy Watersheds Outcome
Vital Habitats Goal	Stream Health Outcome

Memorandum of Understanding

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Outcomes

- Management Board accepts the MOU in July
- Promotes it to the Principle Staff Committee for signature in September

Questions

- Any concerns before forwarding this to the PSC?

Data Examples

Winter Salt Watch




Data Examples

Winter Salt Watch



- Toxic to aquatic life
- Linked to corrosion in water distribution systems \$36B annually nationwide



Corrosion in water distribution systems

- Expensive.
- Linked to metal contamination of drinking water.
- Primary concern in Lead and Copper Rule.

 USGS

Data Examples

Winter Salt Watch



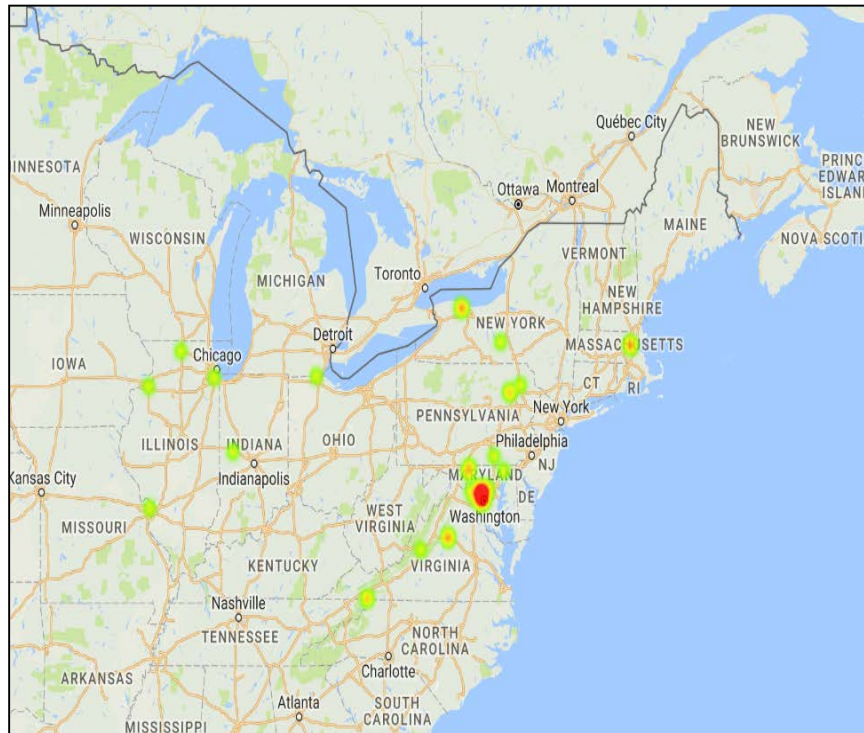
- ✓ What is this calcium chloride doing to our stream?
- ✓ Can we document chloride levels nationwide?
- ✓ Can we run a national campaign on crowdsourced data?
- ✓ Can we use the raw data for sharing the communicating to local communities?



Data Examples

Winter Salt Watch

- ✓ 257 signed up in 24 states and DC
- ✓ 68+ Winter Salt Watch Programs



Chris Reisetter Mar 5

Chloride test instructions on other side.
Need help? Visit iwa.org/saltwatch.

WINTER SALT WATCH
IZAAK WALTON LEAGUE OF AMERICA

Quantab			ppm(mg/L)			Quantab			ppm(mg/L)		
Units	%NaCl	Cl ⁻	Units	%NaCl	Cl ⁻	Units	%NaCl	Cl ⁻	Units	%NaCl	Cl ⁻
1.2	0.005	29	4.6	0.031	187	1.2	0.005	29	4.6	0.031	187
1.4	0.006	35	4.8	0.033	203	1.4	0.006	35	4.8	0.033	203
1.6	0.007	40	5.0	0.036	220	1.6	0.007	40	5.0	0.036	220
1.8	0.008	46	5.2	0.039	237	1.8	0.008	46	5.2	0.039	237
2.0	0.009	53	5.4	0.042	257	2.0	0.009	53	5.4	0.042	257
2.2	0.010	60	5.6	0.046	277	2.2	0.010	60	5.6	0.046	277
2.4	0.011	67	5.8	0.049	299	2.4	0.011	67	5.8	0.049	299
2.6	0.012	75	6.0	0.053	323	2.6	0.012	75	6.0	0.053	323
2.8	0.014	83	6.2	0.057	348	2.8	0.014	83	6.2	0.057	348
3.0	0.015	92	6.4	0.062	375	3.0	0.015	92	6.4	0.062	375
3.2	0.017	102	6.6	0.067	405	3.2	0.017	102	6.6	0.067	405
3.4	0.019	112	6.8	0.072	436	3.4	0.019	112	6.8	0.072	436
3.6	0.020	122	7.0	0.078	471	3.6	0.020	122	7.0	0.078	471
3.8	0.022	134	7.2	0.084	508	3.8	0.022	134	7.2	0.084	508
4.0	0.024	146	7.4	0.090	548	4.0	0.024	146	7.4	0.090	548
4.2	0.026	159	7.6	0.098	592	4.2	0.026	159	7.6	0.098	592
4.4	0.028	173	7.8	0.105	639	4.4	0.028	173	7.8	0.105	639

USE BY: 09/2019 Lot A7282

QUANTAB® Test Strip

Yellow Band

White Peak

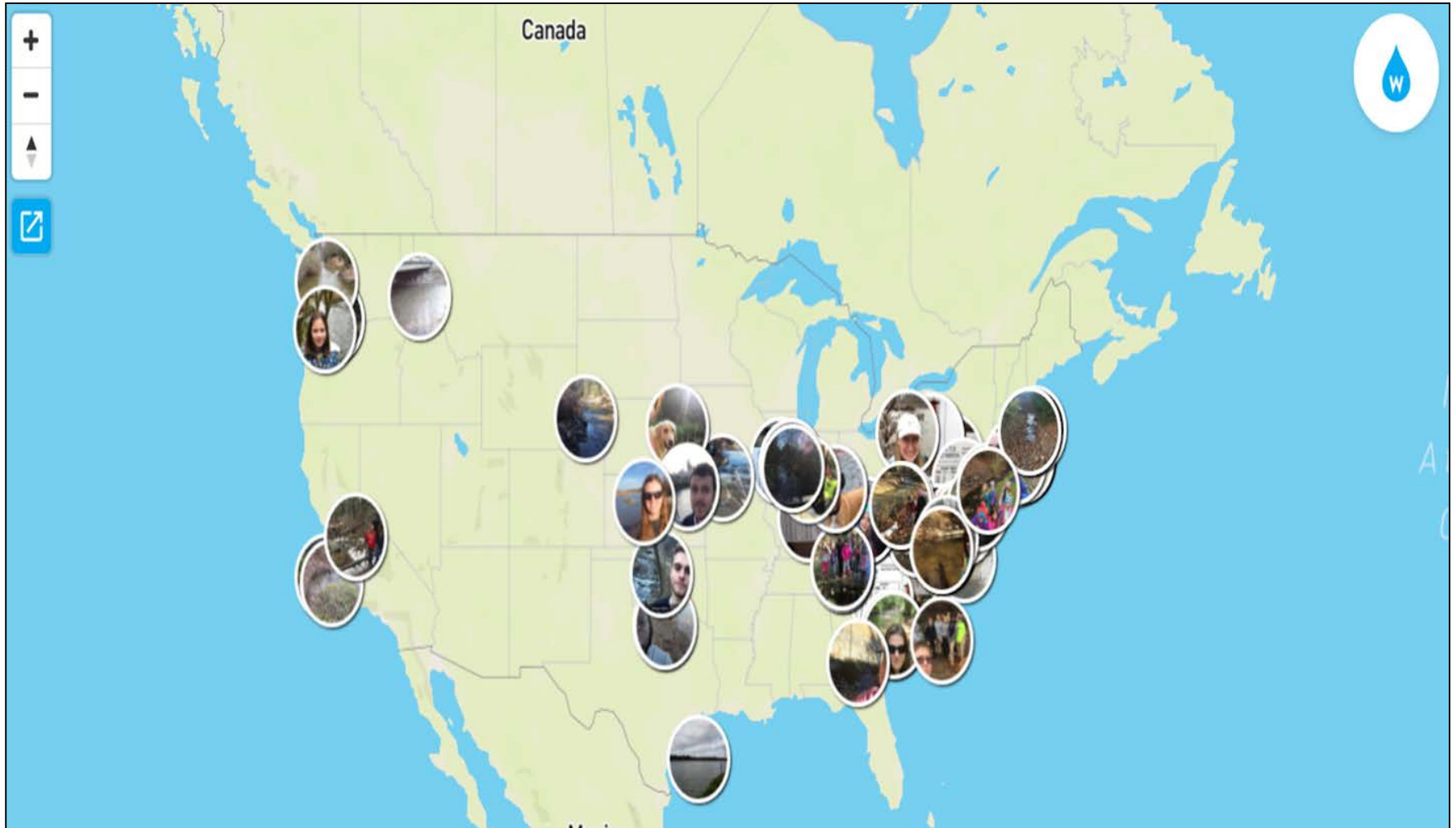
#SaltWatch At the confluence of Spring Creek and the Rock River just before the winter storm.

1

Lower Rock Watershed

Data Examples

Winter Salt Watch



Data Examples

Winter Salt Watch



CMC Applications:

- group collecting the data
- community
- local government
- state/federal government



Salt Management Strategy:

Environmental Impacts and Potential

Economic Costs and Benefits of Improved

Management Practices in Northern Virginia



Prepared for
Virginia Department of Environmental Quality (DEQ)

in partial fulfillment of the requirements of
Contract No. 16577

Prepared by
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January 2018