



MICHIGAN DEPARTMENT OF
ENVIRONMENT, GREAT LAKES, AND ENERGY

Michigan's Chloride Monitoring Partners

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How deriving a new WQS has led to better engagement, support, and data sharing with stakeholders.

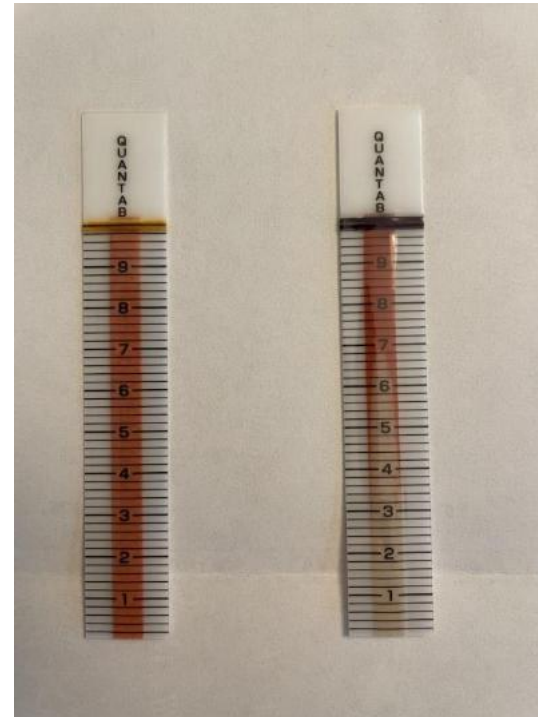
- Chloride provided ground-up chance to learn, test tools, iterate
- Finding that sweet spot with partners between ability, capacity, practicality; data that serves multiple purposes
- Serendipity



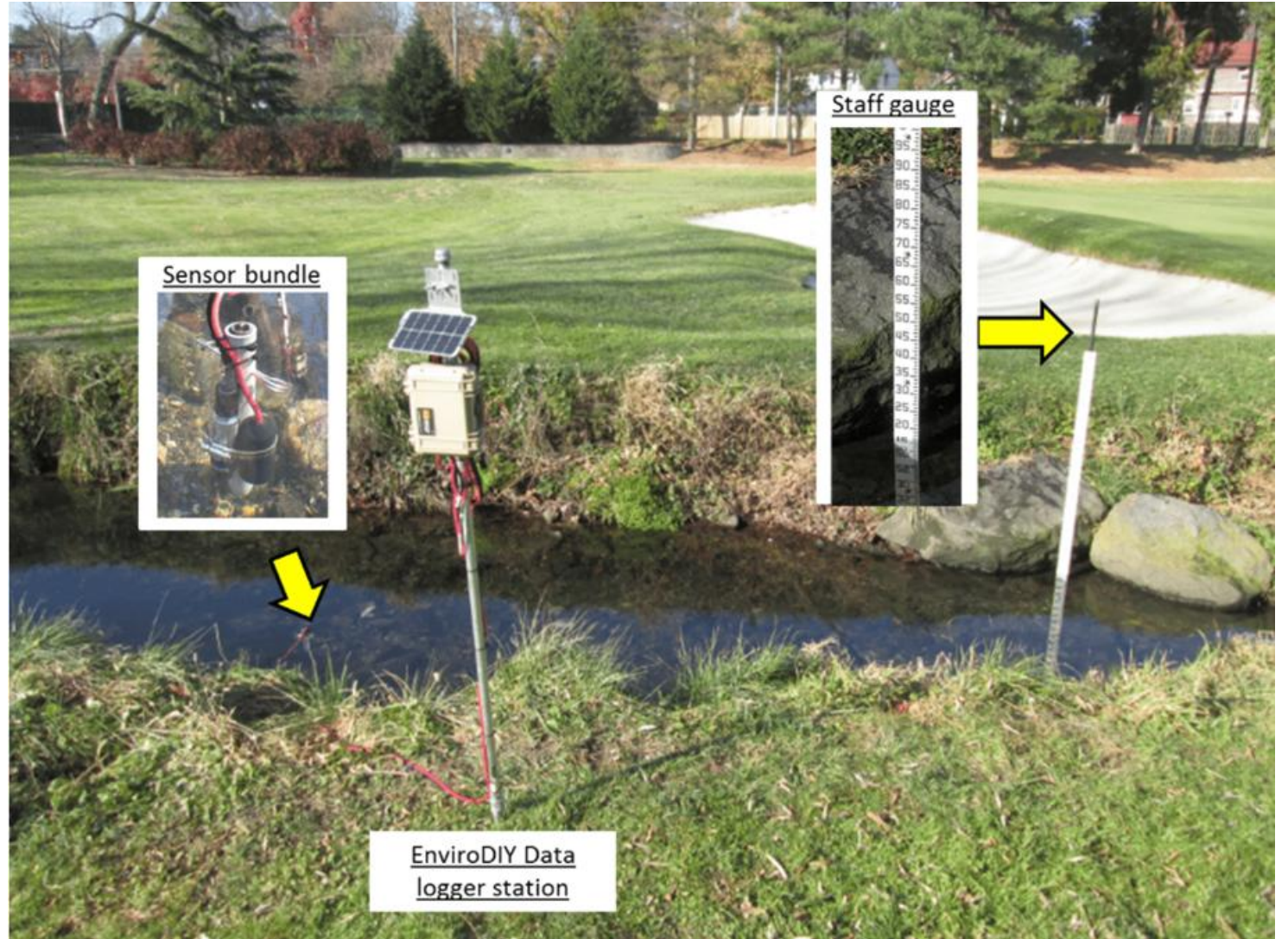
	Acute Value (ambient)	Chronic Value
Chloride (Aquatic Life)	320 mg/L	150 mg/L

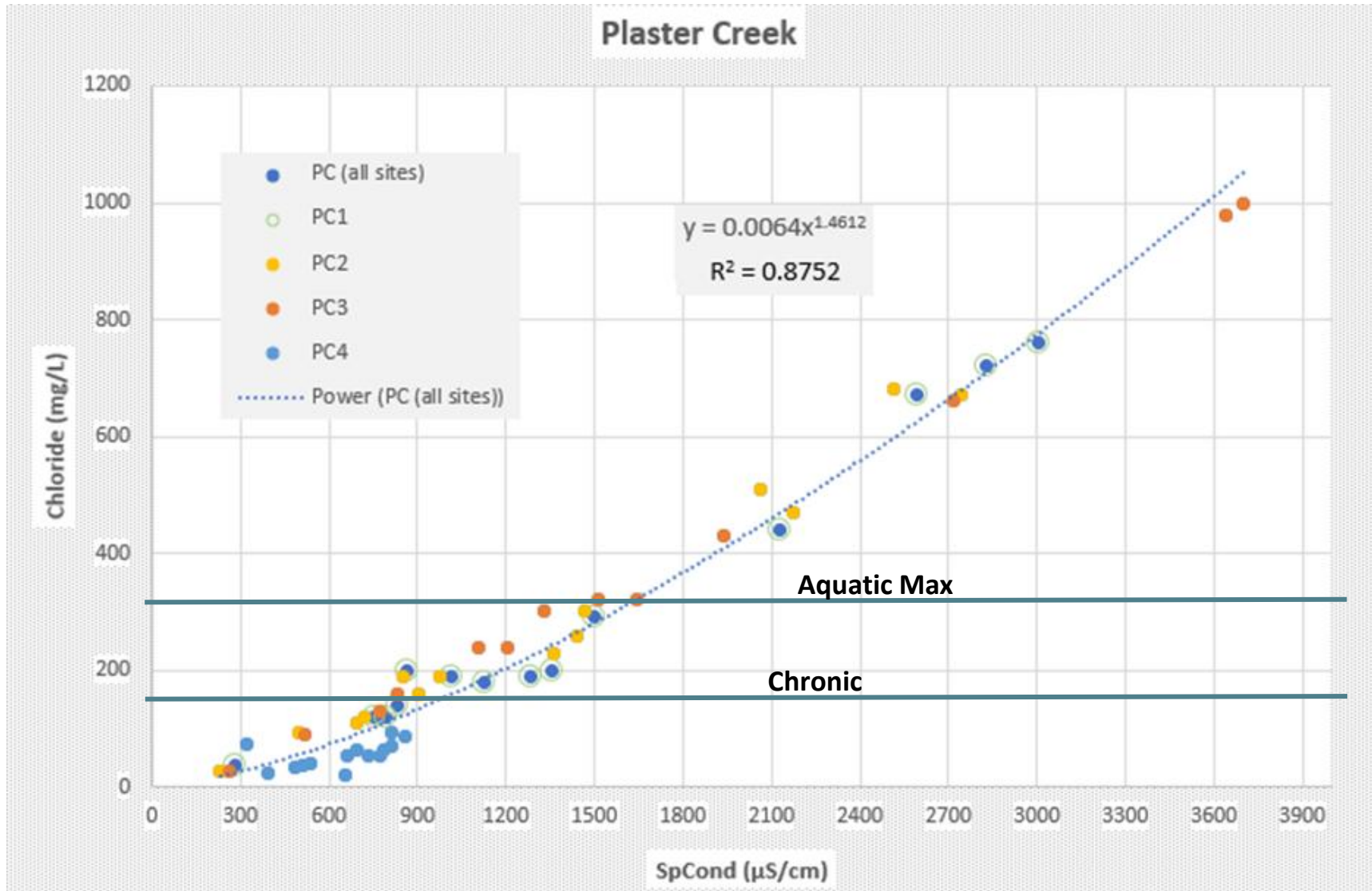
New tools help...

- Leveraging funds to help advance (equipment, state contractors, grants)
- Right partners – sophistication/technical ability, desire to grow programs
- End results –
 - better data for groups to use for problem ID and BMPs, plans;
 - better data for State to use for assessment and understanding of problems;
- More satisfying engagement in BOTH directions.



Tools: EnviroDIY Mayfly





Plaster Creek Stewards

- Use data collected using Mayfly sensors and chloride grabs to establish a conductivity:chloride relationship
- Update Watershed Management Plan to include Chloride targets (new pollutant)
- Additional sensors to use conductivity to explore chloride in additional tributaries in HUC12 watershed, identify BMPs and help drive future education and research efforts related to road salt and green infrastructure
- WE get data for assessment/listing, THEY get data that helps drive implementation
- Move from Volunteers to Advocate/Leaders *(their words; now WE need to figure how to leverage that!)*

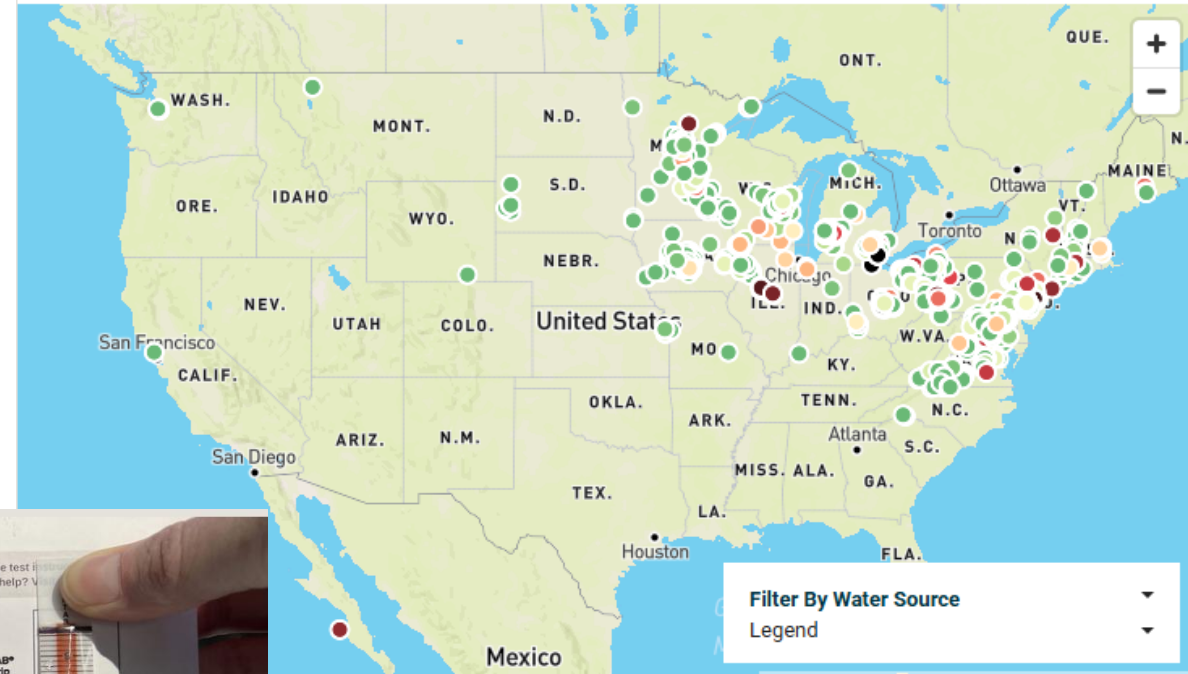
Tools: Quantab strips

- Numerous volunteer groups using strips as part of Izaak Walton Salt Watch
- Past State use as screening in assessment



Salt Watch Map

Start Date End Date [Filter by Dates](#)



Request a Salt Watch Kit

As a Salt Watcher, I pledge to...

- Reduce my road salt use at home and seek out safe alternatives when I can
- Share my knowledge about road salt and water pollution with my family, friends, and neighbors
- Use my FREE Salt Watch kit to test salt levels in my local waterways and add my findings to the national database

[Request Your Kit](#)

SALT WATCH™
IZAAK WALTON LEAGUE OF AMERICA

Quantab Units		ppm(mg/L)		Quantab Units		ppm(mg/L)		
%NaCl	Cl ⁻	%NaCl	Cl ⁻	%NaCl	Cl ⁻	%NaCl	Cl ⁻	
1.4	0.005	31	4.8	0.036	220	5.0	0.039	238
1.6	0.006	37	5.2	0.042	257	5.4	0.046	276
1.8	0.007	44	5.6	0.049	297	5.8	0.052	318
2.0	0.008	50	6.0	0.056	341	6.2	0.060	365
2.2	0.010	58	6.4	0.064	391	6.6	0.069	418
2.4	0.011	66	6.8	0.074	448	7.0	0.075	479
2.5	0.012	75	7.2	0.085	513	7.4	0.091	551
2.8	0.014	85	7.6	0.098	592	7.8	0.105	637
3.0	0.016	95						
3.2	0.017	106						
3.4	0.019	117						
3.5	0.021	130						
3.8	0.024	143						
4.0	0.026	157						
4.2	0.028	172						
4.4	0.031	187						
4.6	0.034	203						

USE BY: 08/2024 Lot #2238

Chloride test kit
Need help? [View](#)

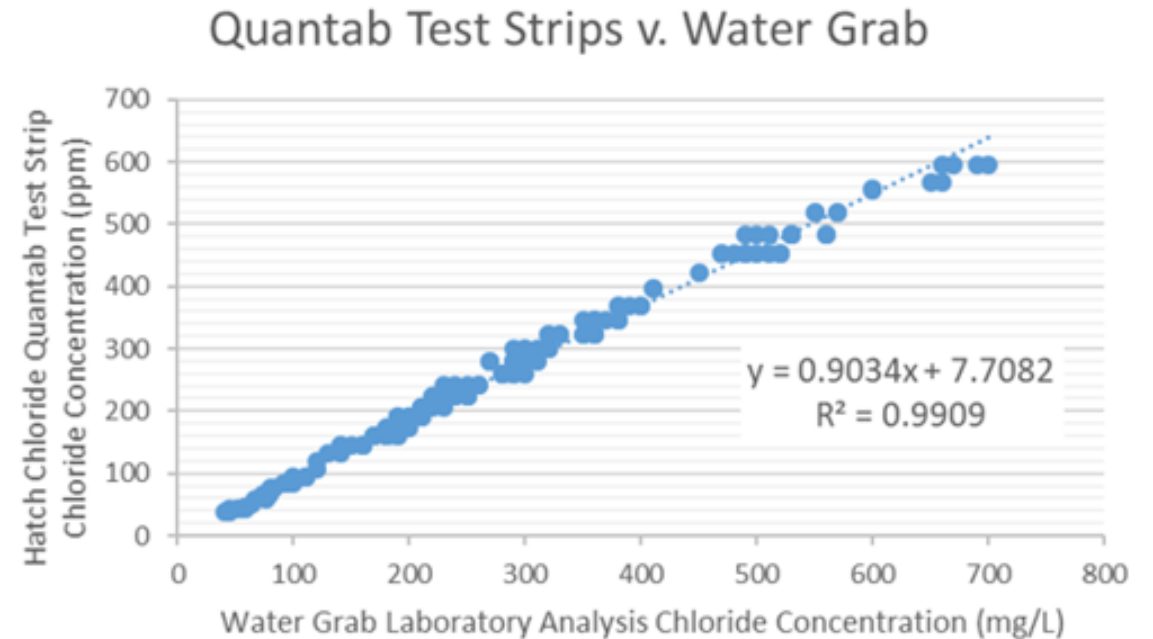
QUANTAB®
Test Strip

Yellow Band

White Peak

Friends of the Rouge

- Izaak Walton League Hach Chloride Quan Tab test strips starting in 2020; wanted to validate to provide useful data for Assessment
- Desired to: *Support ongoing **assessment** of Chloride **impairment** and assess multiple methods of measurement*
- Investigate Quan Tab as inexpensive screening tool for volunteer groups
- Section 106 funds; QAPP, test/correlate 4 methods:
 - YSI conductivity, Quan Tab chloride, YSI chloride, lab-analyzed chloride
- 39 sites, 4x per site, “This frequency is based on the 2022 Integrated Report requiring a minimum of four samples per year for attainment decisions...”.



Sometimes just better communication helps...

- Relationship building
- What are groups doing, how/can we use that information?
- **Better guidance for data** requests → better understanding on State needs and ability to dovetail with existing local monitoring capacity (increase sample size, QAPP)

Michigan Department of Environment, Great Lakes, and Energy, Water Resources Division

Any relevant surface water quality data may be submitted to the EGLE Water Resources Division for consideration in the 2026 303(d), 305(b) and 314 (Integrated Report) assessment process. Data that meet these minimum target durations and sample sizes, in combination with information on sampling and analytical methodology (**typically USEPA approved methods or Standard Methods for surface water**), and quality assurance/quality control (e.g. a Quality Assurance Project Plan or workplan) will be most useful. Data sets less rigorous than stated below may be used to screen water bodies for the future monitoring, as resources allow. This list is based on previously submitted data and is not meant to be exhaustive, those with data not described are encouraged to submit them for consideration.

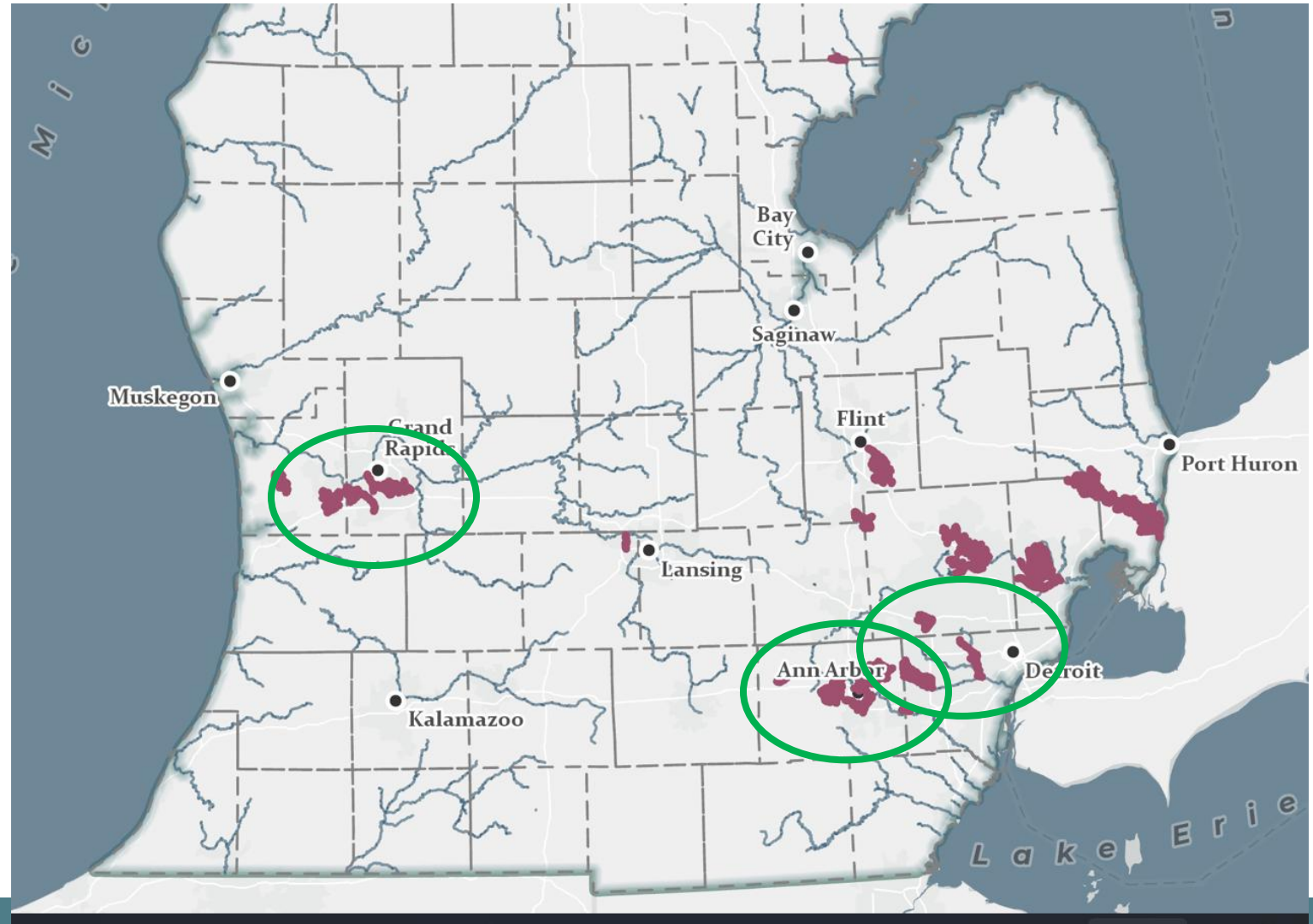
Parameter		Target Sample size	Time frame	Comments
Dissolved oxygen (DO)	Conventional/Other	continuous	≥2 week	
Dissolved oxygen saturation	Conventional/Other	--	--	¹
pH	Conventional/Other	continuous	≥2 week	
Temperature	Conventional/Other	continuous	≥2 week	
Total dissolved solids	Conventional/Other	weekly	≥1 month	Only relevant in water bodies potentially impacted by point-source discharges containing TDS.
Total suspended solids	Conventional/Other	--	--	¹
Turbidity	Conventional/Other	--	--	¹
Specific conductance	Conventional/Other	--	--	¹
Chloride	Conventional/Other	≥4 results	1 year	
Sulfate	Conventional/Other	≥4 results	1 year	
BOD, Sediment Load	Conventional/Other	--	--	¹
Ammonia	Conventional/Other	multiple samples	≥1 week	It is most helpful to have temperature and pH data so that ammonia may be calculated.
Escherichia coli	Bacteria	≥5 samples (each being a geomean of 3 samples)	1 year	
Total Coliform	Bacteria			¹
Phosphorus, total	Nutrients	--	--	¹ Because Michigan has narrative water quality criteria for nutrients (except for nitrates in drinking water source areas), samples taken during the summer growing season are useful in conjunction with observations of nutrient expression (e.g. macrophyte surveys, secchi & chlorophyll-a (in lakes, see below), algae bloom observations, etc.). Nutrient data alone are not typically useful for making water body assessments.
Phosphate	Nutrients	--	--	¹ Because Michigan has narrative water quality criteria for nutrients (except for nitrates in drinking water source areas), samples taken during the summer growing season are useful in conjunction with observations of nutrient expression (e.g. macrophyte surveys, secchi & chlorophyll-a (in lakes, see below), algae bloom observations, etc.). Nutrient data alone are not typically useful for making water body assessments.

Huron River Watershed Council

- Conductivity measured during other annual monitoring efforts suggested potential issues.
- Local POTW lab supported organization by running chloride analyses; finding values above aquatic life protection.
- Monitoring at sample frequency to match state assessment need so data could be used in 303d/305b reporting (2024 IR cycle many listings) ; including QAPP

Chloride-impaired waterbodies to date:

- Chloride Aquatic Life Values established in 2019
- First 303d listings in 2020
- Streams 303d listings in 2020(8); 2022(10); 2024(17) 2026 (30)
- Streams 305b in 2020(1); 2022(10); 2024(229)



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