

Maryland's Core Trend and Non-Tidal Network Monitoring Programs

Integrated Monitoring Network Meeting

6/19/2019

Maryland's Core/Trend Non-tidal Tributary Water Quality Monitoring Program

- **Objectives:** To characterize ambient conditions and trends in water quality throughout Maryland
- **Date Initiated:** 1974
- **Stations:** 54
- **Sampling Frequency:** Monthly sampling from surface waters using bucket grab.
- **Benthic Sampling Component:** Benthic samples are collected at a subset of sites at a 1, 2 and 5 year interval.

Maryland's Core/Trend Non-tidal Tributary Water Quality Monitoring Program

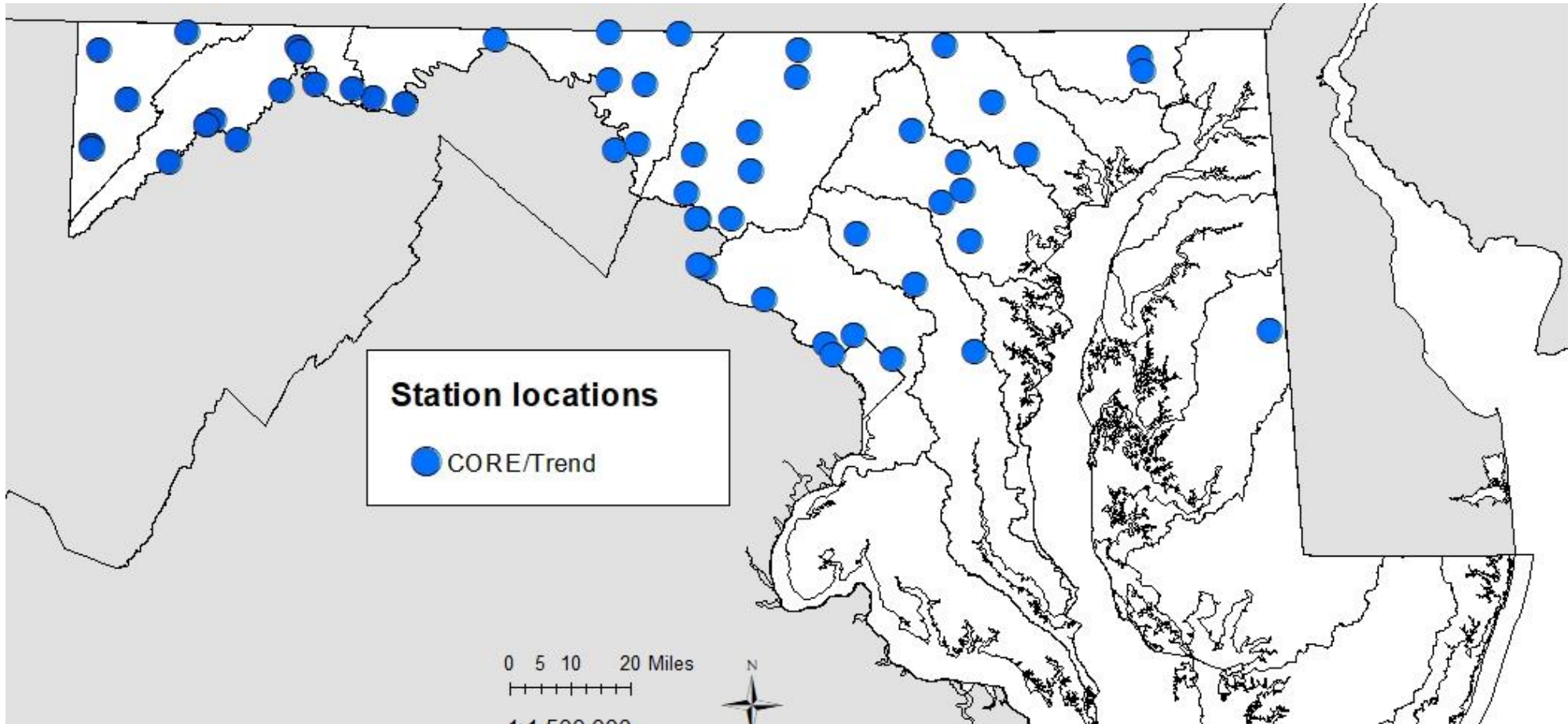
- **Purpose:** The Maryland Department of Natural Resources Section 106 Ambient Water Quality Monitoring Program (CORE\Trend) is part of a cooperative effort between the Federal government and State and local governments in the Chesapeake Bay watershed to assess the status and trends of nutrient concentrations in Maryland's waters.
- The information is integrated with data from other Chesapeake Bay water quality stations and living resources monitoring projects and used to understand linkages, temporal variation and long-term trends.
- Water quality data are used to refine, calibrate and validate Chesapeake Bay ecological models. The models are used to develop and assess water quality criteria with the goal of removing the Chesapeake Bay and its tributaries from the list of impaired waters.

Maryland's Core/Trend Non-tidal Tributary Water Quality Monitoring Program

- **Parameters:**

- Temperature, Dissolved Oxygen, Conductivity, Salinity, pH
- Secchi Depth
- Total Alkalinity, Total Acidity
- TKN, Nitrate, Nitrite, Ammonia
- TP, DIP
- TOC
- TSS, Turbidity
- Chlorophyll a, Phaeophytin
- Total Coliform, Fecal Coliform
- Iron
- Sulfate

Maryland's Core/Trend Non-tidal Tributary Water Quality Monitoring Program



Maryland's Non-Tidal Network Monitoring Program

- **Objectives:** To better estimate nutrient and sediment loadings from the region's rivers and streams.
- **Date Initiated:** 2004
- **Stations:** 24
- **Sampling Frequency:** Stations are located near USGS stream-flow gages to permit estimates of nutrient and sediment loadings and trends in loadings delivered downstream. Routine horizontal/vertical integrated samples are collected monthly, and eight additional storm-event samples are collected per year to obtain 20 samples per year, representing a range of discharge and loading conditions.
 - Under low velocity conditions (<1.5 fps), a horizontally and vertically integrated composite sample will be generated. Isokinetic, equal-width increment samples are only collected during significant storm events.

Maryland's Non-Tidal Network Monitoring Program

Parameters

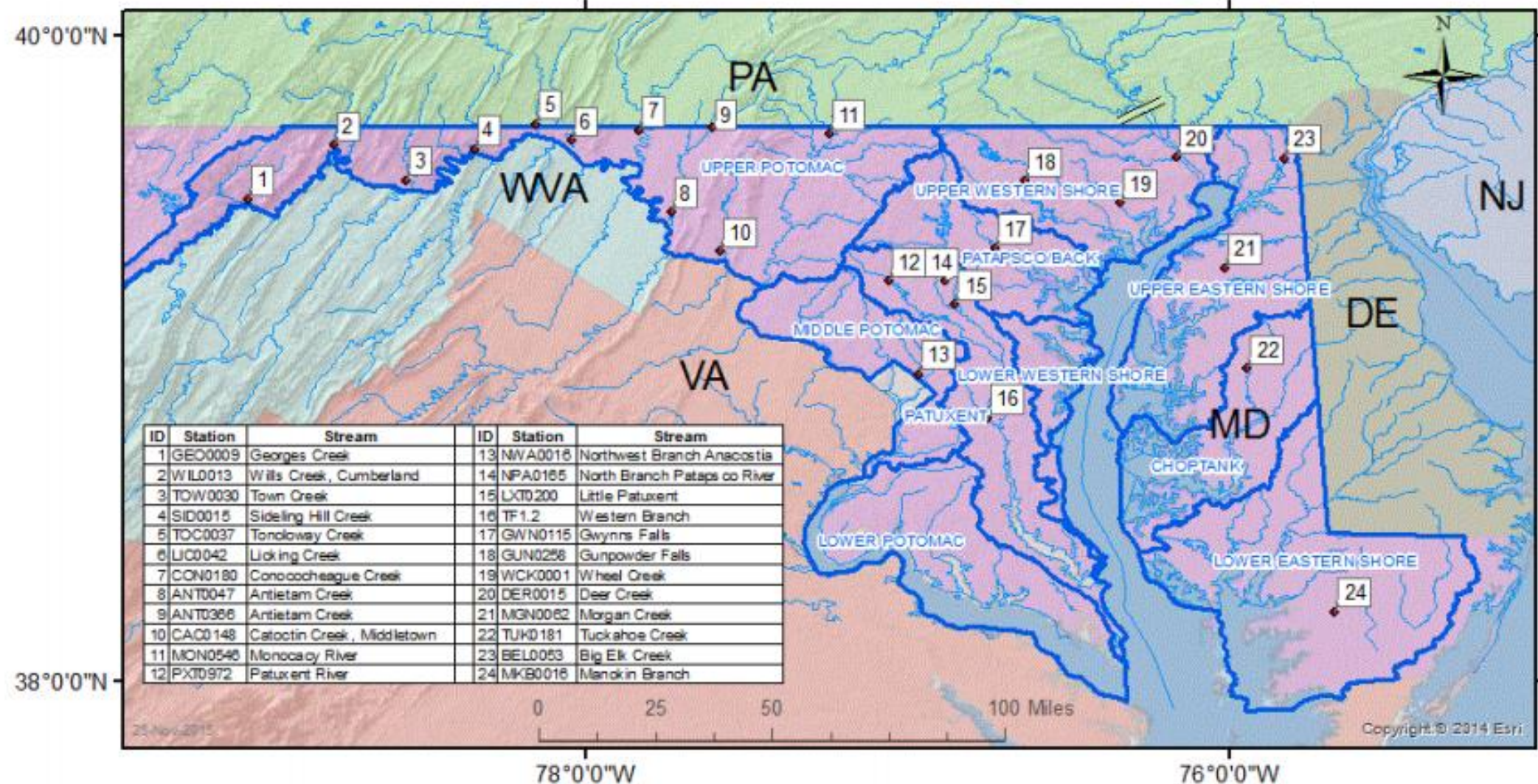
TABLE 2. Parameters and Analytical Methods for the Chesapeake Bay Non-tidal Water-Quality Network

Parameters/Units	Holding Time and Condition	Method/Reference	Method Detection Limit
Field (In situ)			
Temperature, °C	< 5 min.	Standard Methods 2550 B (2000)	0.1 °C
Dissolved Oxygen, mg/L	< 5 min.	Clark cell Standard Methods 4500-OG-2001 Hach LDO Method 10360	0.2 mg/L
pH	< 5 min.	Standard Methods 4500-H ⁺ (2000)	0.1 units
Specific Conductance, umhos/cm	< 5 min.	Standard Methods 2510 (1997)	1 umhos/cm
Laboratory			
Total Nitrogen, mg/L as N	Calculated	PN + TDN	N/A
Ammonium, mg/L as N	Frozen, 28 days/ 4 °C, 48 hrs.	EPA Method 350.1*	0.0016 mg/L
Nitrite, mg/L as N	Frozen, 28 days/ 4 °C, 48 hrs.	EPA Method 353.2*	0.0007 mg/L
Nitrate + Nitrite, mg/L as N	Frozen, 28 days/ 4 °C, 48 hrs.	EPA Method 353.2*	0.003 mg/L

Total Phosphorus, mg/L as P	Calculated	PP+TDP	N/A
Orthophosphate, mg/L as P	Frozen, 28 days/ 4 °C, 48 hrs.	EPA Method 365.1*	0.002 mg/L
Total Suspended Solids, mg/L	4 °C 7 days	Standard Methods 2540D	0.8 mg/L
Suspended Sediment (storms)	Dark Room 120 days	ASTM D3977-97(C)	0.5 mg/L
Sand/Fine Particles (storms)	Dark Room 120 days	ASTM 3977-97(C)	0.5 mg/L
Dissolved Organic Carbon, mg/L as C	Frozen, 28 days/ 4 °C, 48 hrs.	Standard Methods 5310B	0.14 mg/L
Total Dissolved Phosphorus, mg/L as P	Frozen, 28 days/ 4 °C, 48 hrs.	alk. Persulfate then EPA Method 365.1	0.006 mg/L
Total Dissolved Nitrogen, mg/L as N	Frozen, 28 days/ 4 °C, 48 hrs.	Standard Methods 4500-N C	0.034 mg/L
Particulate Carbon, mg/L as C	Frozen 28 days	Exeter Analytical Model CE-440 Elemental Analyzer	0.079 mg/L
Particulate Nitrogen, mg/L as N	Frozen 28 days	Exeter Analytical Model CE-440 Elemental Analyzer	0.0064 mg/L
Particulate Phosphorus, mg/L as P	Frozen 28 days	Filtered particulates HCl extraction, then EPA Method 365.1	0.0003 mg/L

* Dissolved parameters are prepared by filtration through a 0.7 micron glass fiber filter.

Maryland Non-Tidal Network Stations



Maryland Non-Tidal Network Stations

Map #	MDNR Station ID	Stream Name	Lat (NAD83)	Long (NAD83)	Description of Sampling Location	USGS Gage #	Network Station Type
1	GEO0009	Georges Creek	39 29.6183083	079 02.6819417	Victory Street in Westport, MD	01599000	Primary
2	WIL0013	Wills Creek	39 39.7110433	078 46.8174567	Locust Grove Road crossing Wills Creek in Cumberland, MD	01601500	Primary
3	TOW0030	Town Creek	39 33.1933333	078 33.3	Pack Horse Road near Oldtown, MD	01609000	Primary
4	SID0015	Sideling Hill Creek	39 38.9716667	078 20.6483333	Ziegler Road near Bellegrove, MD	01610155	Primary
5	TOC0037	Tonoloway Creek	39 42.3816667	078 9.165	Timber Ridge Road near Hancock, MD	01613095	Primary
6	LIC0042	Licking Creek	39 40.5766667	078 2.5166667	Pecktonville Road, Pectonville, MD	01613525	Primary
7	CON0180	Conococheague Creek	39 42.9833333	077 49.4866667	At gage near Fairview, MD Fairview Road (MD494) bridge	01614500	Primary
8	ANT0047	Antietam Creek	39 27.240000	077 43.965	Burnside Bridge Road near Sharpsburg	01619500	Primary
9	ANT0366	Antietam Creek	39 42.975	077 36.3983333	Millers Church Road near Waynesboro, PA	01619000	Primary
10	CAC0148	Catoctin Creek	39 25.6212	077 33.3708	At bridge on MD 17, Middletown MD	01637500	Primary
11	MON0546	Monocacy River	39 41.7870000	077 14.368000	Bullfrog Road crossing the Monocacy	01639000	Primary
12	PXT0972	Patuxent River	39 14.3584867	077 03.3713467	At bridge on MD 97 near Unity	01591000	Primary
13	NWA0016	NW Branch Anacostia River	38 57.14	076 57.963333	Pedestrian Bridge, Queens Chapel Rd near Hyattsville, MD	01651000	Primary
14	NPA0165	North Branch Patapsco River	39 28.9671333	076 52.9250800	Bridge near gage, Cedarhurst, MD	01586000	Primary
15	LXT0200	Little Patuxent	39 10.065	076 51.075	Guilford Road near Guilford, MD	01593500	Primary
16	TF1.2	Western Branch	38 48.8580017	076 45.05207	At bridge on Water St. in Upper Marlboro	01594526	Primary
17	GWN0115	Gwynns Falls	39 20.5671783	076 43.5833000	At bridge on Essex Road in Villa Nova	01589300	Primary
18	GUN0258	Gunpowder Falls	39 33.0386351	076 38.1520258	Glencoe Road near Sparks, MD	01582500	Primary

Maryland Non-Tidal Network Stations

TABLE 1. Maryland CBP Non-tidal Network Program (continued)

Map #	MDNR Station ID	Stream Name	Lat (NAD83)	Long (NAD83)	Description of Sampling Location	USGS Gauge #	Network Station Type
19	WCK0001	Wheel Creek	39 28.903333	076 20.431667	Near Abingdon, MD	0158175320	Primary
20	DER0015	Deer Creek	39 37.4085651	076 09.8863317	Stafford Road near Darlington MD	01580520	Primary
21	MGN0062	Morgan Creek	39 16.801667	076 0.873333	Perkins Hill Road near Kennedyville, MD	01493500	Primary
22	TUK0181	Tuckahoe Creek	38 58.0280000	075 56.5870000	Tuckahoe Creek at Crouse Mill Rd.	01491500	Primary
23	BEL0053	Big Elk Creek	39 37.2870000	075 49.7160000	Big Elk Creek at Rickett's Mill Road	01495000	Primary
24	MKB0016	Manokin branch	38 12.833333	075 40.283333	Near Princess Anne, MD	01486000	Primary

Maryland CORE/Trend and NTN Stations

