USGS Communication of Nontidal Network

WY 2020 VERSION 2.0

LOADS AND TRENDS

Nitrogen and Phosphorus: What changed?

February 15, 2023

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-OUTLINE-

WHY A REVISION?

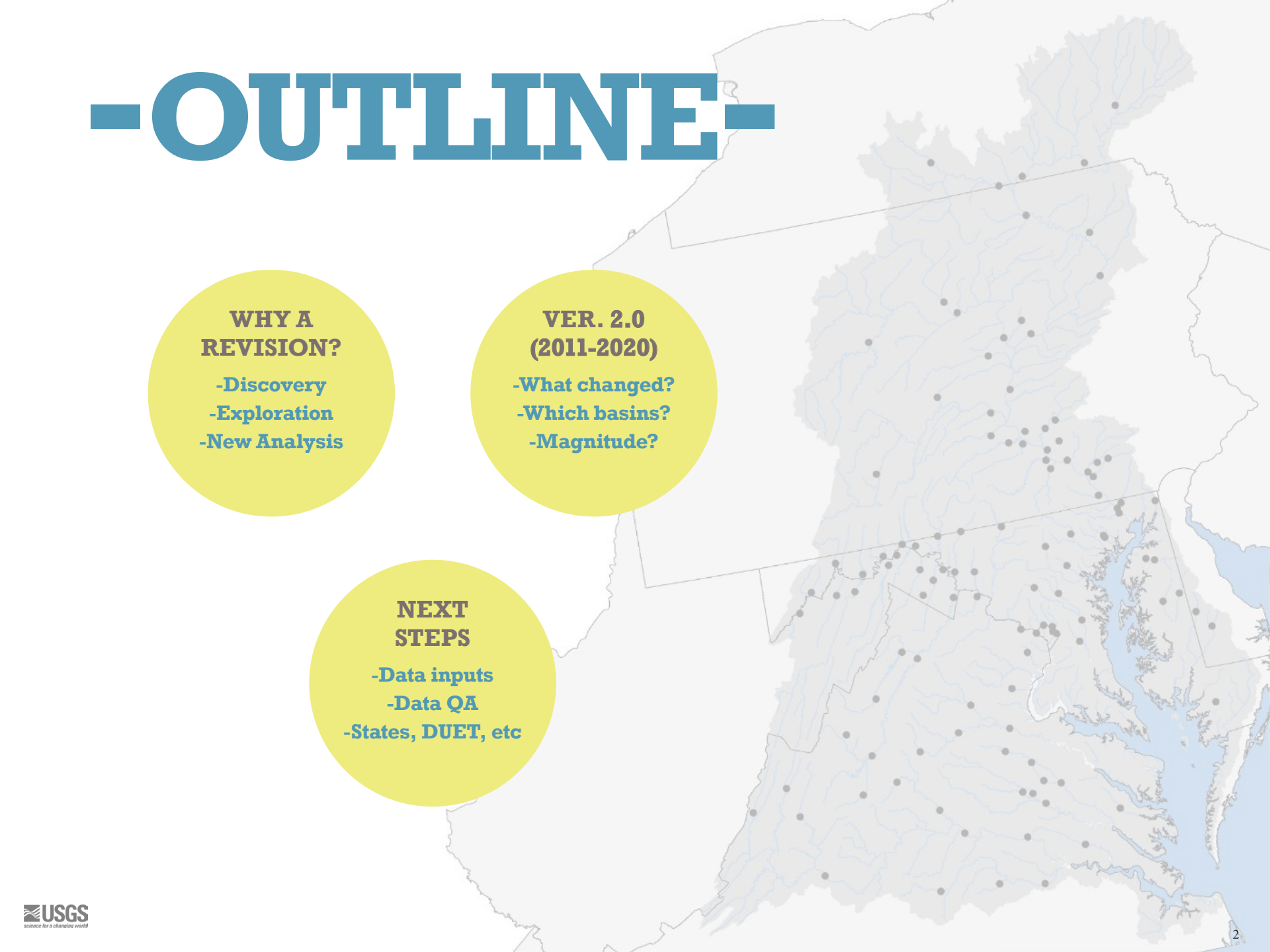
-Discovery
-Exploration
-New Analysis

VER. 2.0 (2011-2020)

-What changed?
-Which basins?
-Magnitude?

NEXT STEPS

-Data inputs
-Data QA
-States, DUET, etc



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Nontidal Network

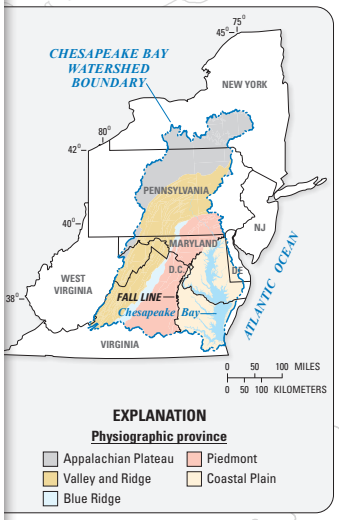
2020 status

EXPLANATION

- *Load-only Site*
- *Short-term Trend Site*
- *Long-term Trend Site*
- *RIM Site*

Major Basins

- *Eastern Shore*
- *Potomac*
- *Susquehanna*
- *Virginia*
- *Western Shore*



BASIN	n Stations	TN Loads	TN Short	TP Loads	TP Short
SUSQUEHANNA	42	42	26	42	26
EASTERN SHORE	8	8	5	8	5
WESTERN SHORE	10	10	6	10	6
POTOMAC	37	37	28	34	22
VIRGINIA	26	26	24	16	11

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DISCOVERY:

ERRORS: Decimal (55), 5 SD/ bad ratio/ blank-rep mixup (21), Large differences (4)

47 sites (of 123), **80 sample data values** (of 171,678) **impacted** (0.047 percent)

- distribution of samples per site: 5 values (1 site), 4 (4), 3 (3), 2 (12), 1 (27)
- pcode constituent value: TN (39), NOx (27), TP (3), DIP (7), SS (4)
- long-term site values: 31 (14 sites)
- short-term site values: 25 (17 sites)
- load site values: 24 (16 sites)

WHAT HAPPENED?

-Discovery
-Exploration
-New Analysis

LT sites:

PA, 4 scenarios (3 sites)
MD, 2 scenarios (1 site)
VA, 2 scenarios (10 sites)

ST sites:

DE, 2 scenarios (2 sites)
NY, 3 scenarios (3 sites)
PA, 3 scenarios (4 sites)
MD, 3 scenarios (5 sites)
VA, 2 scenarios (3 sites)

Loads:

MD, 2 scenarios (3 sites)
PA, 4 scenarios (6 sites)
WVA, 2 scenarios (4 sites)
DC, 2 scenarios (3 sites)

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TOTAL NETWORK TREND CHANGE

EXPLANATION

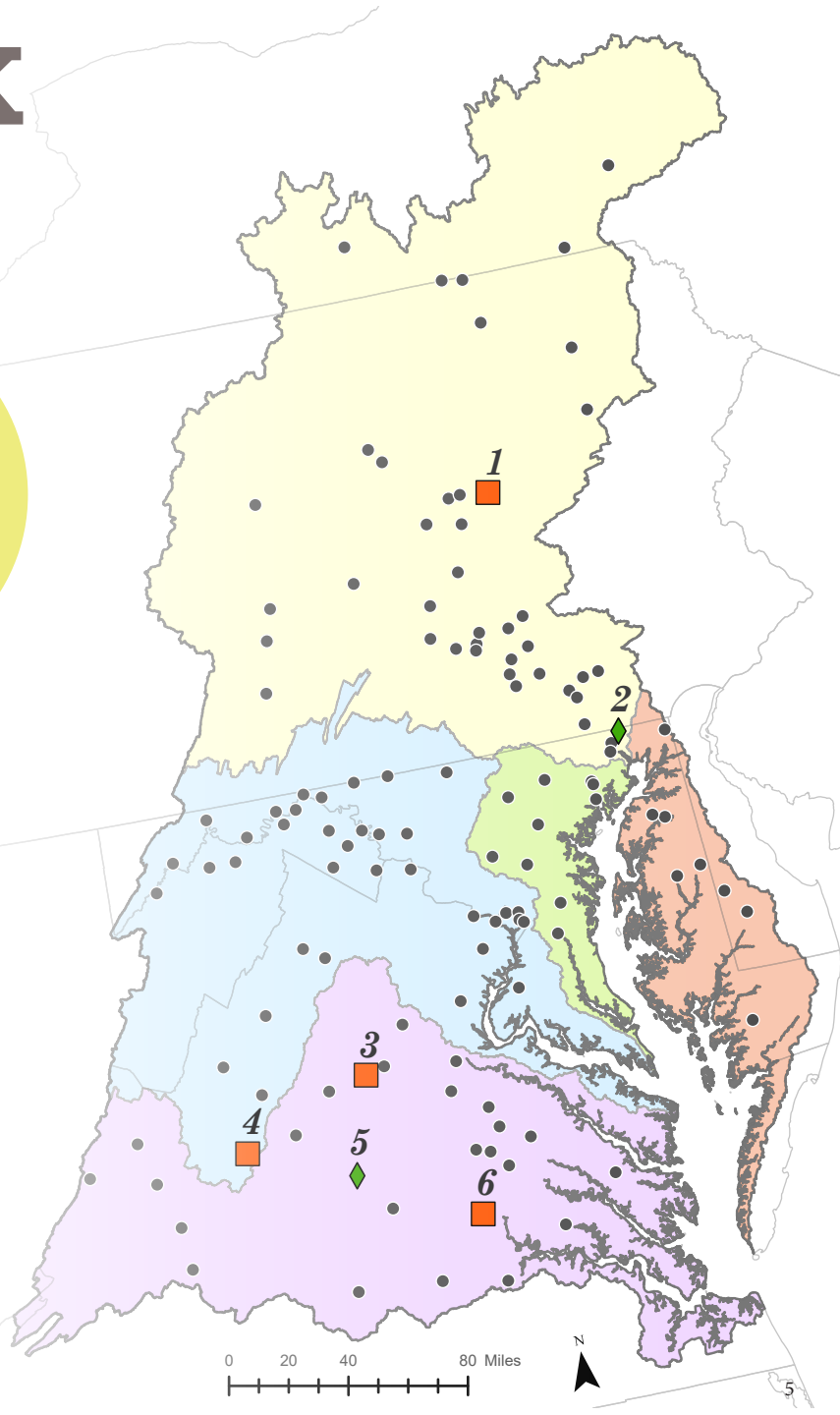
- *LT sites affected*
- *ST sites affected*
- *Sites not affected*

Major Basins

- *Eastern Shore*
- *Potomac*
- *Susquehanna*
- *Virginia*
- *Western Shore*

VER. 2.0 (2011-2020)

-What changed?
-Which basins?
-Magnitude?



1
Susquehanna River, PA *(01540500)*
- no trend to improving
(Sediment, long term)

2
Octoraro Creek, MD *(01578475)*
- no trend to degrading
(TN, short term)

3
South River, VA *(01626000)*
- degrading to no trend
(TN, long term)

4
Robinson River, VA *(01666500)*
- degrading to no trend
(TN, long term)

5
Rivanna River, VA *(02034000)*
- no trend to improving
(TN, short term)

6
James River, VA *(02037500)*
- no trend to improving
(TN, long term)

Trend Direction, 2011-2020 (old)

Degrading

Improving

No Trend

Percent change in flow-normalized load at the nontidal network

Constituents from left-to-right: TN (total nitrogen), N+N (nitrate plus nitrite), TP (total phosphorus), DIP (orthophosphate), SS (suspended sediment)

Two trend direction changes resulted from the new analysis across 380 scenarios

EASTERN SHORE

	TN	N+N	TP	DIP	SS
01487000	7.05	21.9	58.2	-11.8	80.8
01488500	22	26.5	61.7	62.6	63.6
01491000	5.98	1.7	37.8	51	24
01491500	-4.33	-7.64	32.3	38.9	36.2
01495000	5.6	3.98	0.112	-16.8	24.7

WESTERN SHORE

	TN	N+N	TP	DIP	SS
01582500	-2.97	-2.46	8.36	-26.1	49.5
01586000	-5.62	-4.17	-8.61	-12.8	8.42
01589300	-3.4	9.24	-11.6	-27.9	9.72
01591000	10.4	9.83	3.26	17.2	33.1
01594440	-16.6	-18.8	-26.8	-20.4	-27.4
01594526	-4.43	9.34	-9.17	-6.51	-0.887

SUSQUEHANNA

	TN	N+N	TP	DIP	SS
01502500	1.97	13.1	-25	-38.5	-1.55
01503000	-2.81	1.31	-2.19	-54.5	98.2
01515000	2.88	5.13	-16	-41.8	104
01529500	6.16	21.5	-14.6	-49.9	8.94
01531000	9.12	13.2	-24.8	-60.1	70.8
01531500	4.05	5.49	25.6	-53.3	90.4
01534000	16.8	21.4	22.3	25.7	91.7
01536500	-1.36	5.07	-7.64	-42.2	12.2
01540500	-4.54	0.516	-0.901	-54	31
01542500	6.1	17.3	-6.02		-1.49
01549700	19.6	43	29.5		72.2
01553500	-0.754	5.03	-3.97	-34	25.3
01555000	7.33	11	1.47	12.1	-17.5
01562000	15.1	19.6	12.1	2.08	28.7
01567000	9.41	15.6	-16.2	-19.6	-1.89
01568000	15.8	18.6	23.1	22.8	32.8
01570000	3.45	2.96	-11.8	-12	-13.9
01571500	-5.65	-8.92	10.1	16	31.6
01573560	-6.9	-9.61	-13.2	-18.6	-15
01574000	-1.97	-7.3	5.67	9.52	16.1
01576000	-6.01	-1.64	-13.4	-13.2	0.774
01576754	-7.09	-9.25	-3.17	-13.3	18.7
01576787	-2.9	-5.45	9.15	-10.4	20
01578310	-3.24	7.64	-25	-14.1	-34.4
01578475	-0.357	0.929	-13.2	-23	5.87
01580520	-0.173	0.934	5.19	-29	40.2

POTOMAC

	TN	N+N	TP	DIP	SS
01599000	3.46	16.3	-23	-42.6	-10.3
01601500	29.1	33.9	4.03	-33.1	33
01604500	-5.39	-0.852	-53.8	-34.5	-16.4
01608500	8.52	3.26	-47.2	-83.5	41.5
01609000	23	34.1	62.2		24.8
01610155	7.94	36.2			
01611500	-10.2	-14.2	-33.1		4.36
01613095	31.9	41.1	21.7		8.43
01613525	20.6	18.4	-6.51	-38.8	-55.7
01614500	-3.56	-8.07	34.4	-1.34	15.6
01616500	-9.42	-7.05	-58.2	-78.5	39.5
01619000	-11.6	-14.8	-24.9	-43.7	-5.16
01619500	-8.86	-14.1	-10.5	-41.6	67.4
01621050	-7.62	-9.76			
01626000	21.7	29.7			
01628500	-4.45	4.2			
01631000	-5.28	9.98	-26.2	-23.9	-23.6
01632900	6.88	8.11	31.7	-22.4	73.9
01634000	-1.27	10.4	-43.5	-38.4	-49.7
01637500	15.6	21.6	1.33	-13.3	29.6
01638480	2.49	13.7			
01639000	-5.49	5.45	-7.23	2.34	-9.79
01646000	11.5	21.2	65	43.6	128
01646580	-4.14	3.64	-6.06	-30.6	6
01651000	-7.09	12.9	-15.4	-1.26	19.1
01654000	7.76	-7.64	99.9	37.9	267
01658000	2.66	-8.19			
01658500	-11.3	-6.14	-10.7	27.5	-6.94

VIRGINIA

	TN	N+N	TP	DIP	SS
01664000	-0.294	7.25			
01665500	6.08	21.7			
01666500	8.11	21.8			
01667500	-10.8	5.15	-2.21	14.2	0.557
01668000	5.5	14.8	13.7	6.77	16.1
01671020	3.57	48.2	-5.08		-13.1
01671100	-15.6	5.19			
01673000	6.29	22.7	-5.22	-10.3	-16.4
01673800	2.36	16.7			
01674000	1.68	28.3			
01674500	10.5	45.7	6.24	-0.538	25
02011500	16.9	28.1			
02015700	14.7	28.7			
02020500	24.8	39.8			
02024000	1.55	18.5			
02024752	-2.53	19.4	-10.5	-12.2	-12.6
02031000	1.7	22.4			
02034000	-6.7	-14.7	-18.8	-19.2	-22.1
02035000	-6.17	3.86	-14.2	-11.1	-11
02037500	-14.9	6.41	-4.01		4.49
02039500	-7.66	23.2			
02041000	-3.22	12.8			
02041650	17.1	28.4	24.5	48.3	29.7
02042500	-0.175	144	8.75		25.5

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ORIGINAL

	TN	TP
01502500	1.97	-25
01503000	-2.81	-2.19
01515000	2.88	-16
01529500	6.16	-14.6
01531000	9.12	-24.8
01531500	4.05	25.6
01534000	16.8	22.3
01536500	-1.36	-7.64
01540500	-4.54	-0.901
01542500	6.1	-6.02
01549700	19.6	29.5
01553500	-0.754	-3.97
01555000	7.33	1.47
01562000	15.1	12.1
01567000	9.41	-16.2
01568000	15.8	23.1
01570000	3.45	-11.8
01571500	-5.65	10.1
01573560	-6.9	-13.2
01574000	-1.97	5.67
01576000	-6.01	-13.4
01576754	-7.09	-3.17
01576787	-2.9	9.15
01578310	-3.24	-25
01578475	-0.357	-13.2
01580520	-0.173	5.19

REVISION

	TN	TP
01502500	1.97	-25
01503000	-2.81	-2.19
01515000	2.88	-16
01529500	6.16	-14.6
01531000	7.38	-24.8
01531500	4.05	25.6
01534000	16.8	22.3
01536500	-1.36	-7.64
01540500	-4.54	-0.901
01542500	6.1	-6.02
01549700	19.6	29.5
01553500	-0.754	-3.97
01555000	7.33	1.47
01562000	15.1	12.1
01567000	9.36	-16.2
01568000	15.8	23.1
01570000	3.45	-11.8
01571500	-5.65	10.1
01573560	-6.9	-13.2
01574000	-1.97	5.67
01576000	-6.01	-13.4
01576754	-7.65	-3.17
01576787	-2.9	9.15
01578310	-3.24	-25
01578475	0.0561	-13.2
01580520	-0.173	5.19

SUSQ

TN

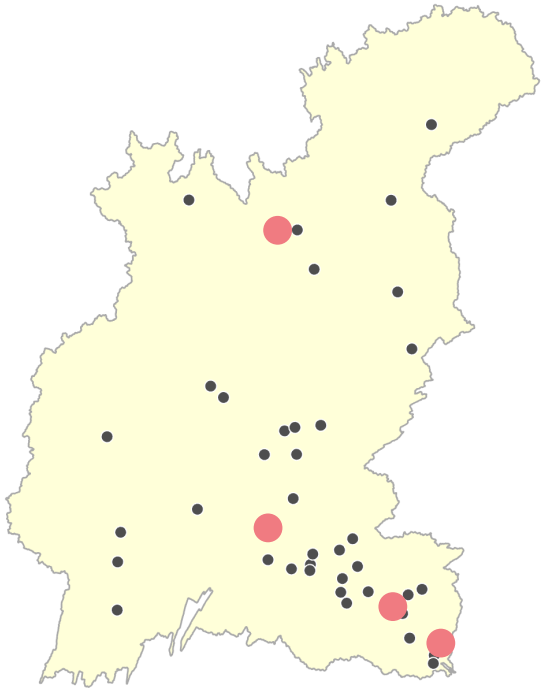
n sites: 26

01531000	-1.74
01567000	-0.05
01576754	-0.56
01578475	+0.41

TP

n sites: 26

n/a



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ORIGINAL

	TN	TP
01487000	7.05	58.2
01488500	22	61.7
01491000	5.98	37.8
01491500	-4.33	32.3
01495000	5.6	0.112

	TN	TP
01582500	-2.97	8.36
01586000	-5.62	-8.61
01589300	-3.4	-11.6
01591000	10.4	3.26
01594440	-16.6	-26.8
01594526	-4.43	-9.17

REVISION

	TN	TP
01487000	7.05	57.6
01488500	22	61.7
01491000	5.98	37.8
01491500	-4.33	32.3
01495000	5.6	0.112

	TN	TP
01582500	-2.97	8.36
01586000	-5.62	-8.61
01589300	-3.4	-11.6
01591000	10.4	3.26
01594440	-16.6	-26.8
01594526	-5.03	-9.17

ES/WS

TN

n sites: 11

01594526 -0.6

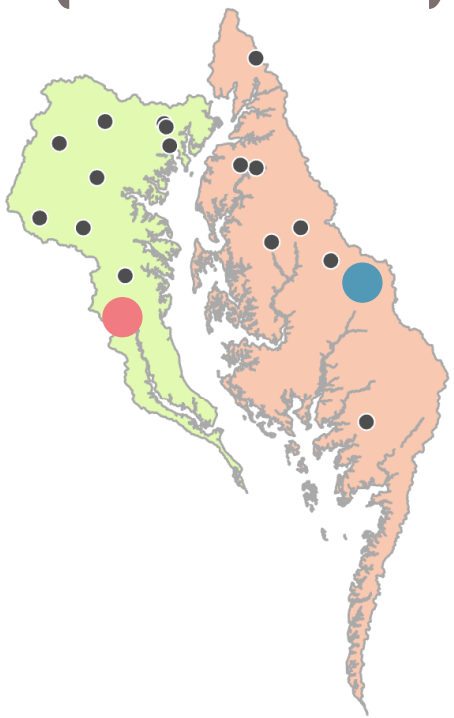
Western Shore

TP

n sites: 11

01487000 -0.6

Eastern Shore



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ORIGINAL

	TN	TP
01599000	3.46	-23
01601500	29.1	4.03
01604500	-5.39	-53.8
01608500	8.52	-47.2
01609000	23	62.2
01610155	7.94	
01611500	-10.2	-33.1
01613095	31.9	21.7
01613525	20.6	-6.51
01614500	-3.56	34.4
01616500	-9.42	-58.2
01619000	-11.6	-24.9
01619500	-8.86	-10.5
01621050	-7.62	
01626000	21.7	
01628500	-4.45	
01631000	-5.28	-26.2
01632900	6.88	31.7
01634000	-1.27	-43.5
01637500	15.6	1.33
01638480	2.49	
01639000	-5.49	-7.23
01646000	11.5	65
01646580	-4.14	-6.06
01651000	-7.09	-15.4
01654000	7.76	99.9
01658000	2.66	
01658500	-11.3	-10.7

REVISION

	TN	TP
01599000	3.46	-23
01601500	24.5	4.03
01604500	-5.39	-53.8
01608500	8.52	-47.2
01609000	23	58.5
01610155	7.94	
01611500	-10.2	-33.1
01613095	32	21.7
01613525	20.6	-6.51
01614500	-3.56	34.4
01616500	-9.42	-58.2
01619000	-11.6	-24.9
01619500	-8.86	-10.5
01621050	-10.2	
01626000	14	
01628500	-4.09	
01631000	-6.26	-26.2
01632900	7.83	31.7
01634000	-6.27	-43.5
01637500	15.6	1.33
01638480	2.49	
01639000	-5.49	-7.23
01646000	11.5	65
01646580	-4.14	-6.06
01651000	-7.09	-15.4
01654000	7.32	99.9
01658000	2.66	
01658500	-11.7	-10.7

POTO

TN

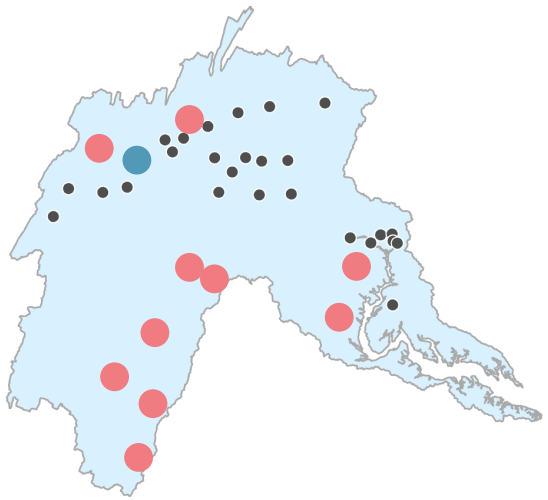
n sites: 28

01601500	-4.6
01613095	+0.1
01621050	-2.58
01626000	-7.7
01628500	+0.36
01631000	-0.98
01632900	+0.95
01634000	-5
01654000	-0.44
01658500	-0.4

TP

n sites: 22

01609000	-3.7



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ORIGINAL

	TN	TP
01664000	-0.294	
01665500	6.08	
01666500	8.11	
01667500	-10.8	-2.21
01668000	5.5	13.7
01671020	3.57	-5.08
01671100	-15.6	
01673000	6.29	-5.22
01673800	2.36	
01674000	1.68	
01674500	10.5	6.24
02011500	16.9	
02015700	14.7	
02020500	24.8	
02024000	1.55	
02024752	-2.53	-10.5
02031000	1.7	
02034000	-6.7	-18.8
02035000	-6.17	-14.2
02037500	-14.9	-4.01
02039500	-7.66	
02041000	-3.22	
02041650	17.1	24.5
02042500	-0.175	8.75

REVISION

	TN	TP
01664000	-0.681	
01665500	6.08	
01666500	6.13	
01667500	-10.8	-2.21
01668000	5.5	13.7
01671020	3.57	-5.08
01671100	-15.6	
01673000	6.29	-5.22
01673800	2.36	
01674000	1.68	
01674500	10.5	6.24
02011500	16.9	
02015700	3.06	
02020500	24.8	
02024000	1.55	
02024752	-2.53	-10.5
02031000	1.7	
02034000	-21	-18.8
02035000	-6.17	-14.2
02037500	-19.2	-4.01
02039500	-7.66	
02041000	-3.22	
02041650	17.1	24.5
02042500	-0.175	8.75

VA

TN

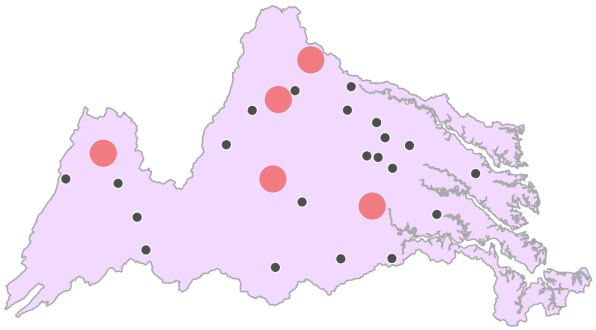
n sites: 24

01664000	-0.387
01666500	-1.98
02015700	-11.64
02034000	-14.3
02037500	-4.3

TP

n sites: 11

n/a



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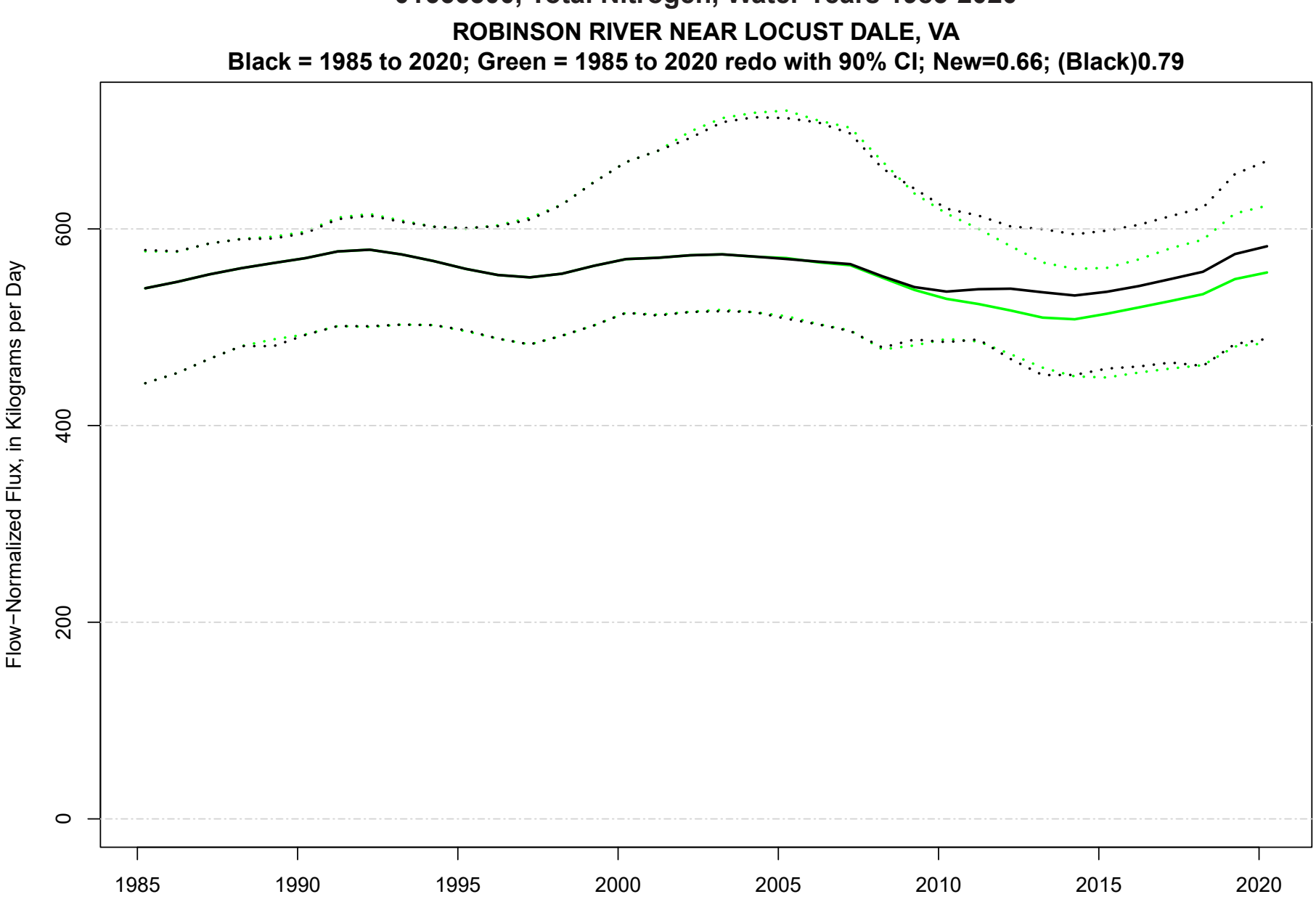
01666500, Total Nitrogen, Water Years 1985-2020
ROBINSON RIVER NEAR LOCUST DALE, VA
Black = 1985 to 2020; Green = 1985 to 2020 redo with 90% CI; New=0.66; (Black)0.79
Flow−Normalized Flux, in Kilograms per Day
0
200
400
600
1985
1990
1995
2000
2005
2010
2015
2020

New analysis results show:

Short-term trends (~80 NTN sites, 2011-2020):

- **Total Nitrogen: 2 sites had a change in trend direction.**
  - Rivanna River, VA (02034000) no trend to improving (2 decimal values)
  - Octoraro Creek, MD (01578475) no trend to degrading (1 decimal value)
- **Total Phosphorus: no changes in trend direction**
- **Sediment: no changes in trend direction**

Short-term total mean Likelihood Difference (90% CI shift): 0.06

Mean % change across entire short-term network: (TN: -0.62) (N+N: -0.38) (TP: -0.06) (DIP: 0) (SS: +0.28)

Total % unchanged across entire short-term population: 91%

Spatial change clusters: Lower Susq, Upper Potomac and VA's Shenandoah Valley

Broad view takeaway: error identification was small and changes were generally in an "improving" direction

Long-term trends (~40 NTN sites, 1985-2020):

- **Total Nitrogen: 3 sites had a change in trend direction.**
  - South River, VA (01626000) degrading to no trend (2 decimal values)
  - Robinson River, VA (01666500) degrading to no trend (1 decimal value)
  - James River, VA (02037500) no trend to improving (2 decimal values)
- **Total Phosphorus: no changes in trend direction**
- **Sediment: 1 site had a change in trend direction.**
  - Susquehanna River, PA (01540500) no trend to improving (2 large differences)

Long-term total mean Likelihood Difference (90% CI shift): 0.08

Loads

- **Mean percent difference among 47 sites, 1,257 years and 58 scenarios: 2.46%**

Yields

- **5-year mean difference (lb/acre): 0.298; 10-year mean difference (lb/acre): 0.716**

NOTE:
The River-Input Monitoring (RIM) Stations are not affected by these data integrity issues.

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Nitrogen, phosphorus, and suspended-sediment loads and trends measured at the Chesapeake Bay Nontidal Network stations: Water years 1985-2020 (ver. 2.0, January 2023)

View

Dates

Start Date : 1984-10-01
End Date : 2020-09-30
Publication Date : 2022-07-25
Revision : 2023-01-06

Citation

Mason, C.A., Colgin, J.E., and Moyer, D.L., 2023, Nitrogen, phosphorus, and suspended-sediment loads and trends measured at the Chesapeake Bay Nontidal Network stations: Water years 1985-2020 (ver. 2.0, January 2023): U.S. Geological Survey data release, https://doi.org/10.5066/P96H2BDO.

Summary

Nitrogen, phosphorus, and suspended-sediment loads, and changes in loads, in major rivers across the Chesapeake Bay watershed have been calculated using monitoring data from the Chesapeake Bay Nontidal Network (NTN) stations stations for the period 1985 through 2020. Nutrient and suspended-sediment loads and changes in loads were determined by applying a weighted regression approach called WRTDS (Weighted Regression on Time, Discharge, and Season). The load results represent the total mass of nitrogen, phosphorus, and suspended sediment that was exported from each of the NTN watersheds and were estimated using the WRTDS method with Kalman filtering. To determine the trend in loads, the annual load results are flow normalized to integrate out the year-to-year variability in river discharge. The trend in load is derived from the flow-normalized load timeseries and represents the change in load resulting from changes in sources, delays associated with storage or transport of historical inputs, and (or) implemented management actions. Four data tables are provided that describe nitrogen, phosphorus, and suspended-sediment conditions across the NTN: (1) Annual Loads, (2) Monthly Loads, (3) Trends in Annual Loads, and (4) Average Yield (mass per unit area). Additionally, essential WRTDS Input and Output files are provided. First posted: July 25, 2022 (available from author) Revised: January 2023 (version 2.0)

Child Items (6)

- Chesapeake Bay Nontidal Network 1985-2020: Annual loads (ver. 2.0, January 2023)
- Chesapeake Bay Nontidal Network 1985-2020: Average annual yields (ver. 2.0, January 2023)
- Chesapeake Bay Nontidal Network 1985-2020: Monthly loads (ver. 2.0, January 2023)
- Chesapeake Bay Nontidal Network 1985-2020: Short- and long-term trends (ver. 2.0, January 2023)
- Chesapeake Bay Nontidal Network 1985-2020: WRTDS input data (ver. 2.0, January 2023)
- Chesapeake Bay Nontidal Network 1985-2020: WRTDS output data (ver. 2.0, January 2023)

Contacts

Map »

Spatial Services

ScienceBase WMS : https://www.sciencebase.gov/catal

Communities

- USGS Data Release Products

Tags

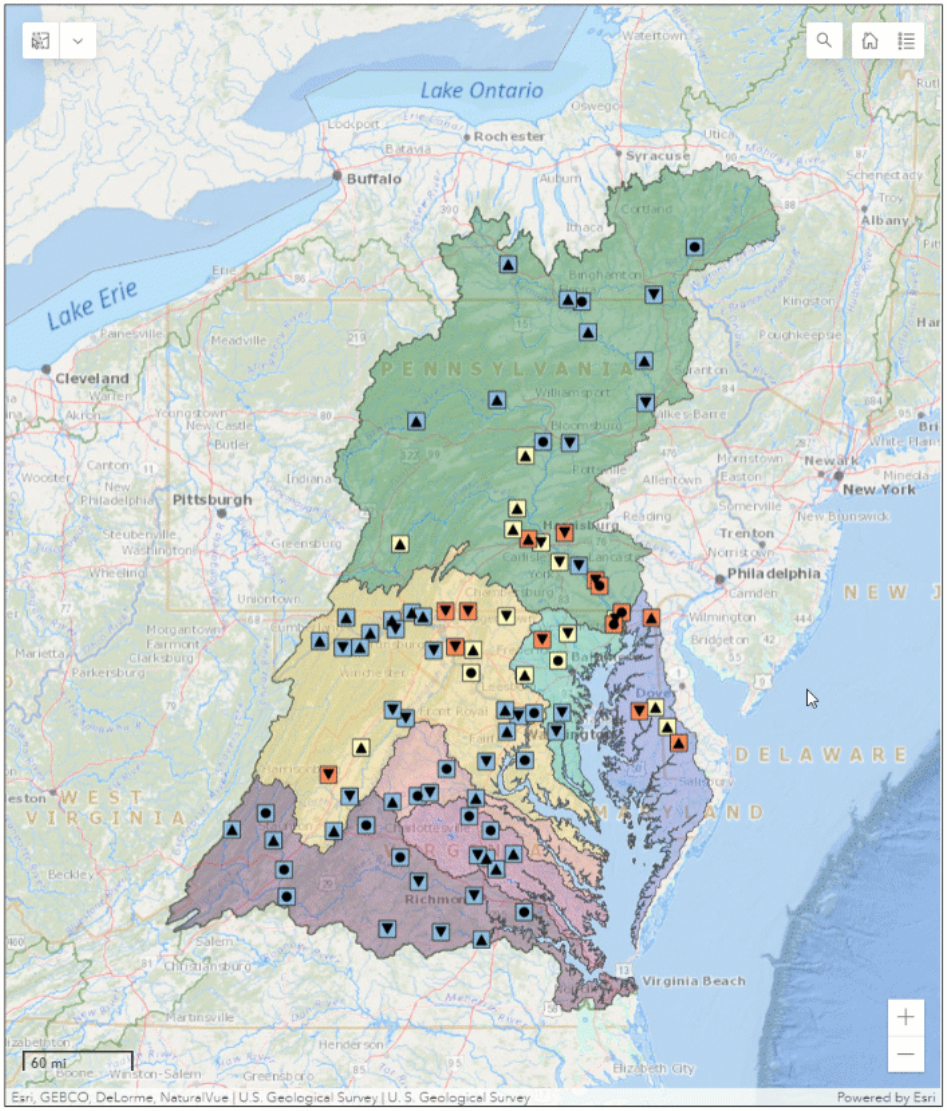
Categories : Data Release - Revised
Harvest Set : USGS Science Data Catalog (SDC)
Theme : Kalman filtering, WRTDS, WRTDS-K, load analysis, nitrogen, nutrients, phosphorus, rivers, suspended sediment, trends, water quality, weighted regression
Place : Chesapeake Bay Watershed, Delaware, Maryland, New York, Pennsylvania, United States, Virginia, Washington DC, West Virginia
Types : Map Service, OGC WFS Layer, OGC WMS Layer, OGC WMS Service

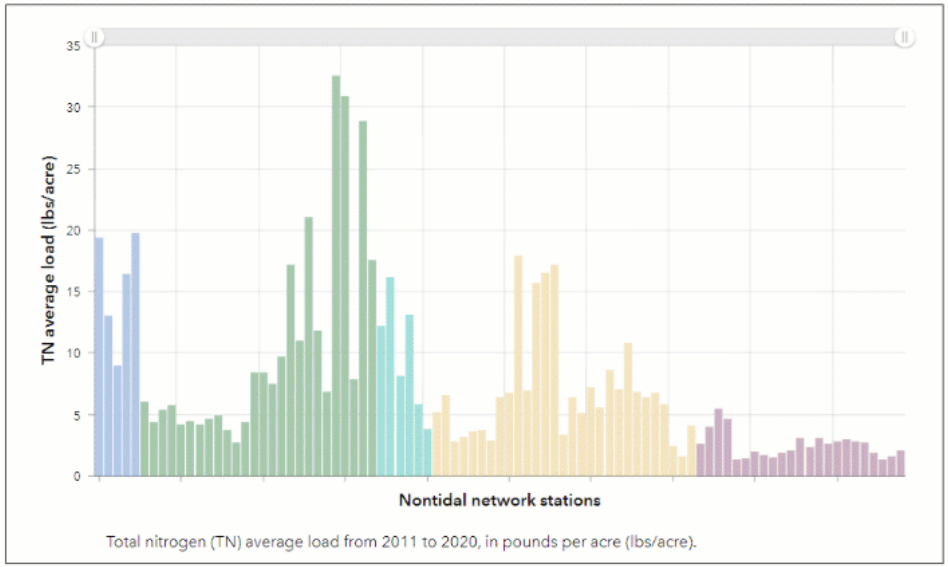
Provenance

Revision 2.0 by Christopher A Mason on January 6,

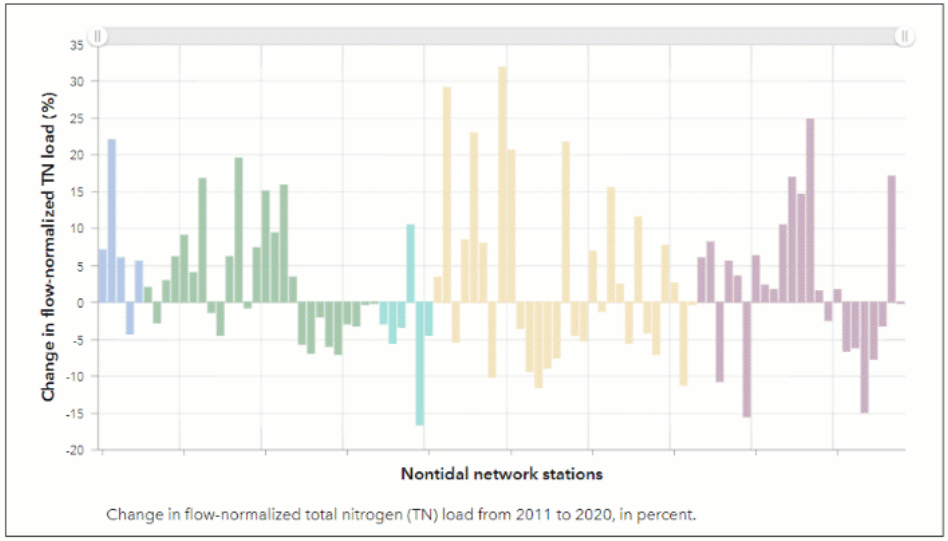
va.water.usgs.gov/geonarratives/ntn

Graph tool | Query tool





Total nitrogen (TN) average load from 2011 to 2020, in pounds per acre (lbs/acre).



Change in flow-normalized total nitrogen (TN) load from 2011 to 2020, in percent.

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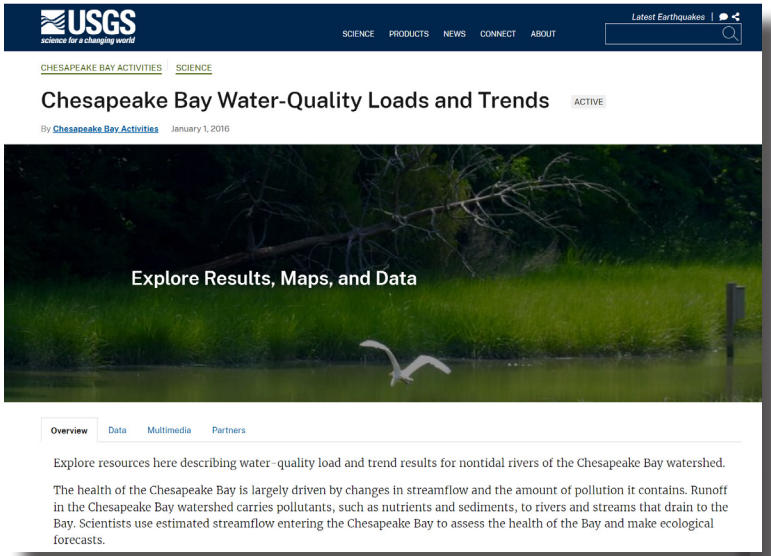
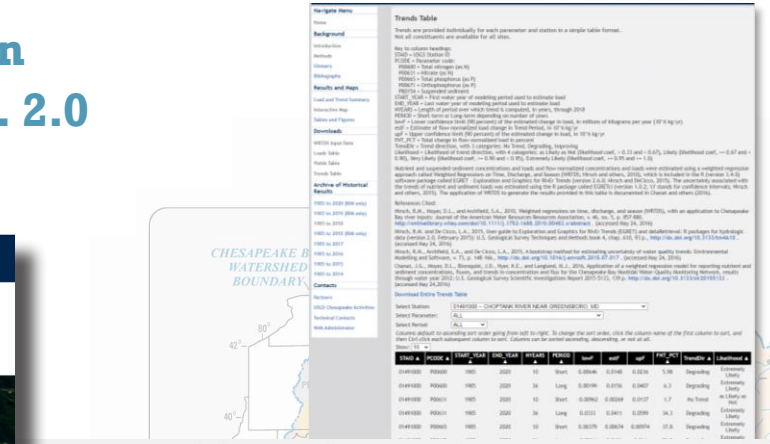
usgs.gov/CB-wq-loads-trends

The monitoring webpage has been updated with 2021 RIM and 2020 ver. 2.0 NTN results and a new URL



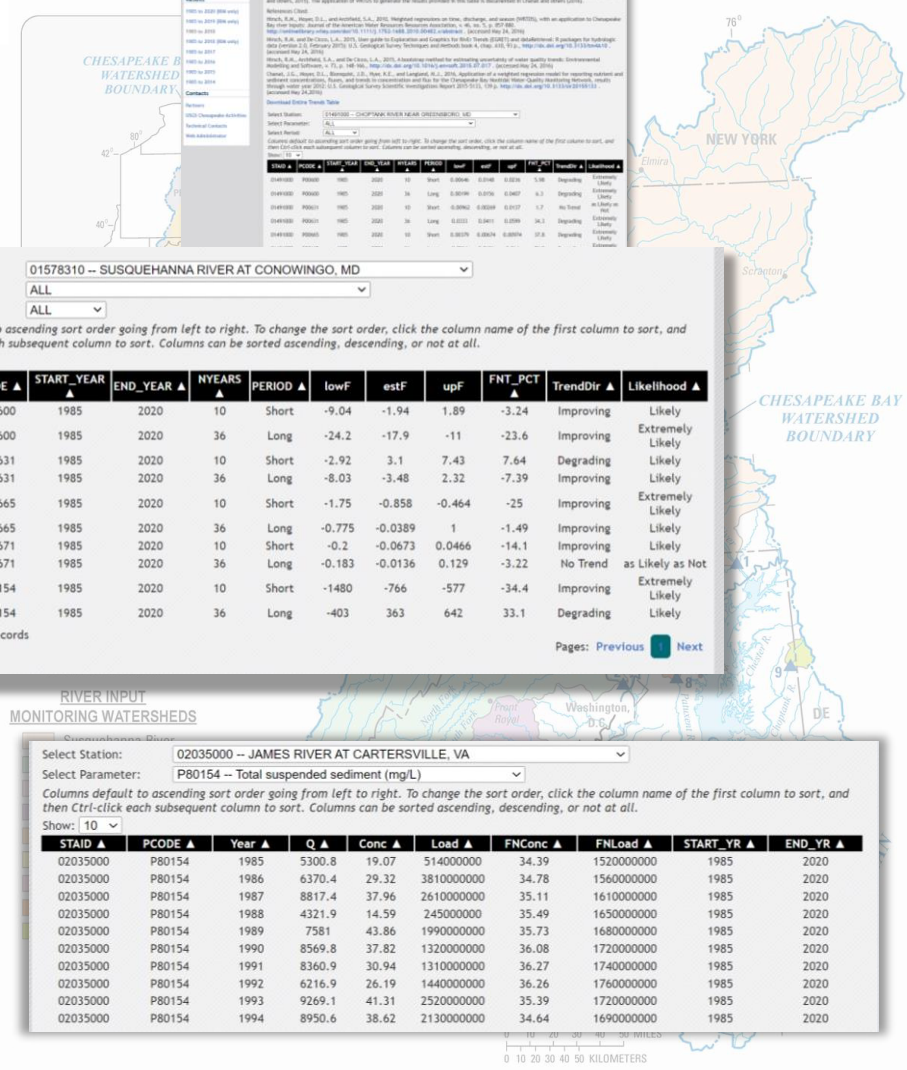


Select Station: 01578310 -- SUSQUEHANNA RIVER AT CONOWINGO, MD
Select Parameter: ALL
Select Period: ALL
Columns default to ascending sort order going from left to right. To change the sort order, click the column name of the first column to sort, and then Ctrl-click each subsequent column to sort. Columns can be sorted ascending, descending, or not at all.
Show: 10

STAID	PCODE	START_YEAR	END_YEAR	NYEARS	PERIOD	lowF	estF	upF	FNT_PCT	TrendDir	Likelihood
01578310	P00600	1985	2020	10	Short	-9.04	-1.94	1.89	-3.24	Improving	Likely
01578310	P00600	1985	2020	36	Long	-24.2	-17.9	-11	-23.6	Improving	Extremely Likely
01578310	P00631	1985	2020	10	Short	-2.92	3.1	7.43	7.64	Degrading	Likely
01578310	P00631	1985	2020	36	Long	-8.03	-3.48	2.32	-7.39	Improving	Likely
01578310	P00665	1985	2020	10	Short	-1.75	-0.858	-0.464	-25	Improving	Extremely Likely
01578310	P00665	1985	2020	36	Long	-0.775	-0.0389	1	-1.49	Improving	Likely
01578310	P00671	1985	2020	10	Short	-0.2	-0.0673	0.0466	-14.1	Improving	Likely
01578310	P00671	1985	2020	36	Long	-0.183	-0.0136	0.129	-3.22	No Trend	as Likely as Not
01578310	P80154	1985	2020	10	Short	-1480	-766	-577	-34.4	Improving	Extremely Likely
01578310	P80154	1985	2020	36	Long	-403	363	642	33.1	Degrading	Likely

Showing 10 of 10 records
Pages: Previous 1 Next

RIVER INPUT MONITORING STATION	TOTAL NITROGEN LOAD		TOTAL PHOSPHORUS LOAD		SUSPENDED-SEDIMENT LOAD	
	Long-term	Short-term	Long-term	Short-term	Long-term	Short-term
SUSQUEHANNA RIVER AT CONOWINGO, MD	Improving	Improving	No Trend	Improving	Degrading	Improving
POTOMAC RIVER AT CHAIN BRIDGE, MD	Improving	Improving	Improving	Improving	Improving	No Trend
JAMES RIVER AT CARTERSVILLE, VA	Improving	Improving	Improving	Improving	No Trend	Improving
RAPPAHANNOCK RIVER NEAR FREDERICKSBURG, VA	Improving	Degrading	Degrading	No Trend	Degrading	No Trend
APPOMATTOX RIVER AT MATOACA, VA	Degrading	Degrading	Degrading	Degrading	Degrading	Degrading
PAMUNKEY RIVER NEAR HANOVER, VA	No Trend	No Trend	Degrading	Improving	Degrading	Improving
MATTAPONI RIVER NEAR BEULAHVILLE, VA	Improving	Degrading	No Trend	Improving	No Trend	Degrading
PATUXENT RIVER AT BOWIE, MD	Improving	Improving	Improving	Improving	Improving	Improving
CHOPTANK RIVER NEAR GREENSBORO, MD	Degrading	Degrading	Degrading	Degrading	Improving	Degrading



Select Station: 02035000 -- JAMES RIVER AT CARTERSVILLE, VA
Select Parameter: P80154 -- Total suspended sediment (mg/L)
Columns default to ascending sort order going from left to right. To change the sort order, click the column name of the first column to sort, and then Ctrl-click each subsequent column to sort. Columns can be sorted ascending, descending, or not at all.
Show: 10

STAID	PCODE	Year	Q	Conc	Load	FNConc	FNLoad	START_YR	END_YR
02035000	P80154	1985	5300.8	19.07	514000000	34.39	1520000000	1985	2020
02035000	P80154	1986	6370.4	29.32	3810000000	34.78	1560000000	1985	2020
02035000	P80154	1987	8817.4	37.96	2610000000	35.11	1610000000	1985	2020
02035000	P80154	1988	4321.9	14.59	245000000	35.49	1650000000	1985	2020
02035000	P80154	1989	7581	43.86	1990000000	35.73	1680000000	1985	2020
02035000	P80154	1990	8569.8	37.82	1320000000	36.08	1720000000	1985	2020
02035000	P80154	1991	8360.9	30.94	1310000000	36.27	1740000000	1985	2020
02035000	P80154	1992	6216.9	26.19	1440000000	36.26	1760000000	1985	2020
02035000	P80154	1993	9269.1	41.31	2520000000	35.39	1720000000	1985	2020
02035000	P80154	1994	8950.6	38.62	2130000000	34.64	1690000000	1985	2020

usgs.gov/centers/chesapeake-bay-activities/science/usgs-revises-2020-nontidal-load-and-trend-results

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USGS revises 2020 nontidal load and trend results

COMPLETED

By Chesapeake Bay Activities January 19, 2023

Overview

Issue: The USGS has revised loads and trends through 2020 from monitoring stations in the Chesapeake Bay Program (CBP) Nontidal Network (NTN). The original release of the results was in July 2022. During a process to implement a new software package for the next update of NTN data, the USGS discovered some questionable data values. Most of the questionable values were related to a coding transcription error that was occurring for selected values when data were pulled into files used to compute loads and trends for each NTN site, while others were related to data-reporting. The USGS has (1) corrected the data, (2) rerun all the loads and trends, and (3) updated the 2020 loads and trends.

Evaluation of Data Values

The USGS performed an examination of all the data used to compute loads and trends at 123 NTN sites: a total of 171,678 values of nutrient and sediment data. The review flagged 80 values that had data integrity issues, which represents 0.05 percent of the NTN data. The distribution of the flagged data was: 39 values for total nitrogen, 27 values for nitrate plus nitrite, 3 values for total phosphorous, 7 values for dissolved inorganic phosphorus, and 4 values for suspended sediment. The flagged values were associated with load computations at 16 sites, short-term trends at 17 sites, and long-term trends at 14 sites. USGS examined and corrected all the flagged values.

Updated Trend Results

Using the corrected data, the USGS reran both the short-term (2011-2020) and long-term trends (1985-2020) for the impacted sites. Ultimately, there were changes in trend direction at 2 sites for short-term trends, and 4 sites with long-term trends (figure 1).

For short-term trends, at the ~80 NTN sites, 2011-2020, 2 sites had a

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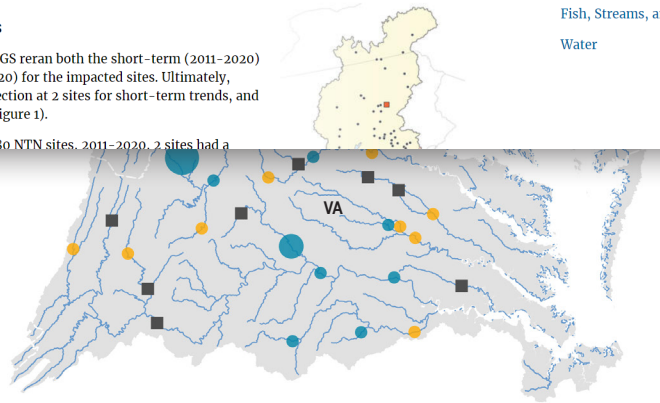
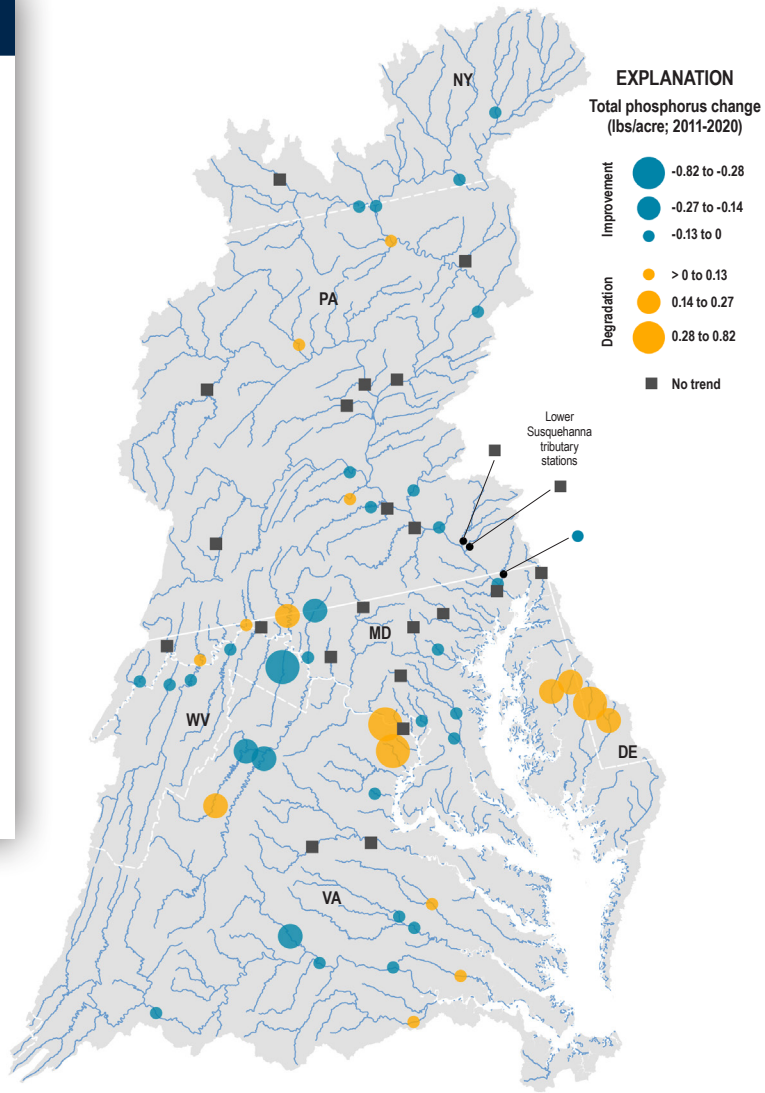
Explore Search

Nutrient, Sediment, and Flow

Fish, Streams, and Water Quality

Water





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NEXT STEPS

-Data inputs
-Data QA
-States, DUET, etc

Work with WSCs, state agencies and labs regarding their data

- Address historical NTN database (pre ~2010)
- Initiate reconstruction of entire database (do all agencies have pre ~2010 data on the Water Quality Portal?)
- Can DUET screen historic data?
- Verification of decision rules for constituent coding with each WSC and their relative lab (in perpetuity)

NTN 2022 input data and results QA

- Potential state participation in initial WRTDS outlier identification
- Final load and trend QA of results will stay within VA and PA WSCs (VA and MD for RIM)

Questions?

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