

NTN Communication of Data Corrections

A map of the Northeast United States, including parts of New England and the Mid-Atlantic region. The map is color-coded by state: Maine (yellow), New Brunswick (light blue), Quebec (light green), New Hampshire (light blue), Vermont (light green), Massachusetts (light blue), Connecticut (light green), Rhode Island (light blue), New Jersey (light green), Delaware (light blue), Maryland (light green), Virginia (light blue), North Carolina (light green), South Carolina (light blue), and Georgia (light green). Numerous small colored dots (green, red, grey) are scattered across the map, representing data points. Several yellow stars are also visible, particularly in the southern and central regions. A horizontal line extends from the right side of the title text across the map.

ITAT 12-07-2022

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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

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

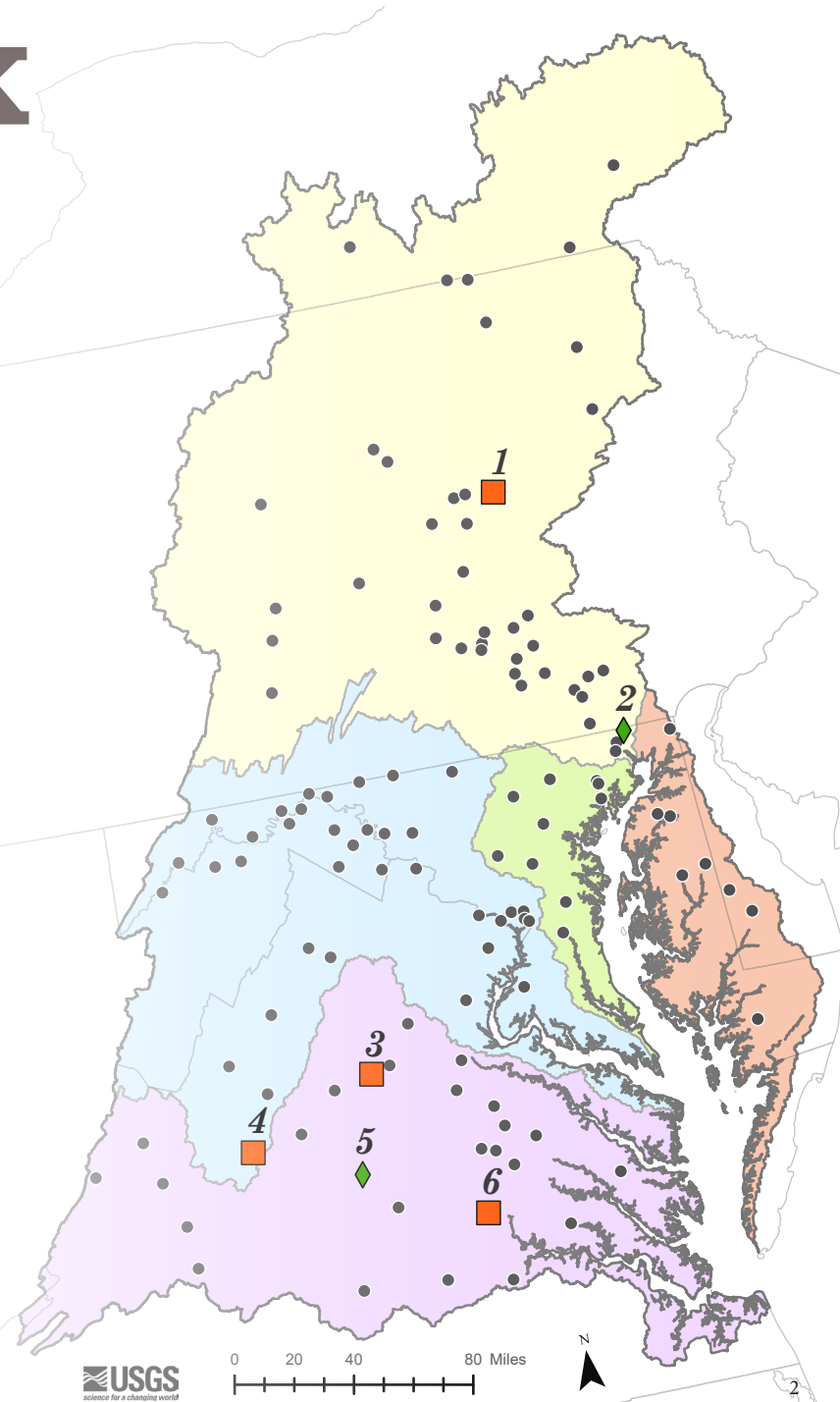
2
Octoraro Creek, MD (01578475)
- no trend to degrading
(TN, short term)

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)



QUALITY CONTROL MEASURES:

The USGS examined several issues with data and results of the 2020 Nontidal Network (NTN) update. The issues were related mostly to a coding transcription error that occurs for selected values when the data are pulled from the original providers into the USGS files to compute the loads and trends for each NTN site. Additional issues included elevated dissolved/particulate ratios, large NWIS/data-pull differences, and erroneous NWIS coding.

Corrective Actions:

The USGS examined all values associated with the NTN sites: a total of 171,678 values of nutrient and sediment data. The review flagged 81 values that had data integrity issues, which represents 0.0471 percent of the NTN data.

The USGS has corrected the flagged values.

DISCOVERY:

ERRORS: Decimal (55), 5 SD/ bad ratio/ blank-rep mixup (22), Large differences (4)

47 sites (of 123), 81 sample data values (of 171,678) impacted

- distribution of samples per site: 5 values (1 site), 4 (4), 3 (3), 2 (12), 1 (27)
- pcode constituent value: TN (39), NOx (28), TP (3), DIP (7), SS (4)
- long-term site values: 31 (14 sites)
- short-term site values: 26 (17 sites)
- load site values: 24 (16 sites)

LT sites:

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

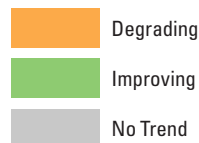
ST sites:

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)

Trend Direction, 2011-2020



Percent change in flow-normalized load (numbers) 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)

	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

	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

	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

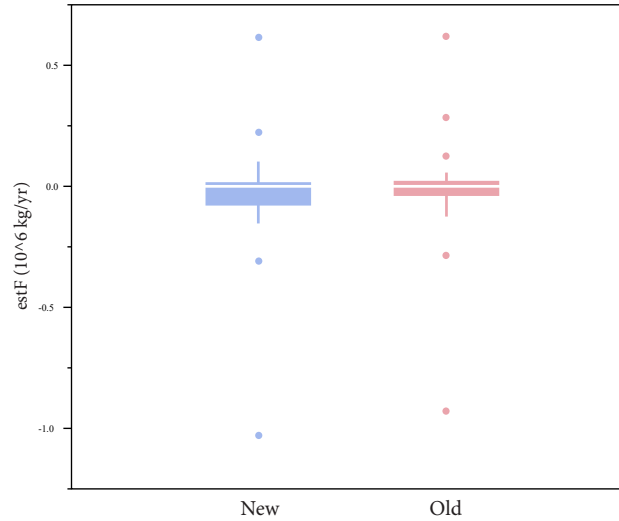
	TN	N+N	TP	DIP	SS
01599000	3.46	16.3	-23	-42.6	-10.3
01601500	29.1	33.9	4.03	-33.1	33
01604500	-5.39	-0.852	-53.8	-34.5	-16.4
01608500	8.52	3.26	-47.2	-83.5	41.5
01609000	23	34.1	62.2		24.8
01610155	7.94	36.2			
01611500	-10.2	-14.2	-33.1		4.36
01613095	31.9	41.1	21.7		8.43
01613525	20.6	18.4	-6.51	-38.8	-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

Only two trend direction changes resulted from the new analysis

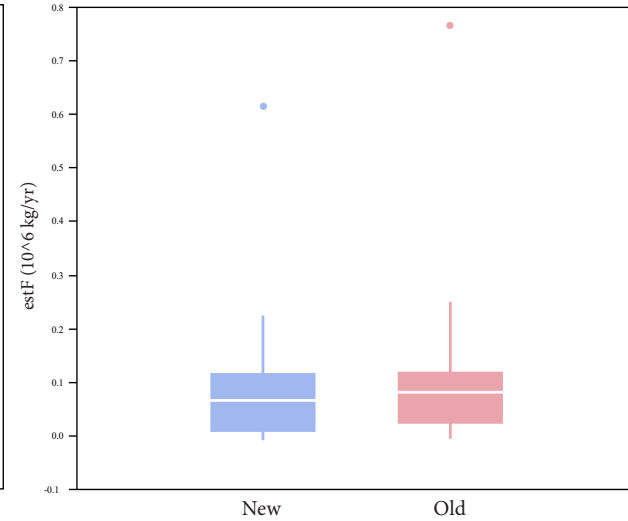
	TN	N+N	TP	DIP	SS
01664000	-0.294	7.25			
01665500	6.08	21.7			
01666500	8.11	21.8			
01667500	-10.8	5.15	-2.21	14.2	0.557
01668000	5.5	14.8	13.7	6.77	16.1
01671020	3.57	48.2	-5.08		-13.1
01671100	-15.6	5.19			
01673000	6.29	22.7	-5.22	-10.3	-16.4
01673800	2.36	16.7			
01674000	1.68	28.3			
01674500	10.5	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

Boxplots of new vs published of estimated flow-normalized change in Short-term load (trend magnitude)

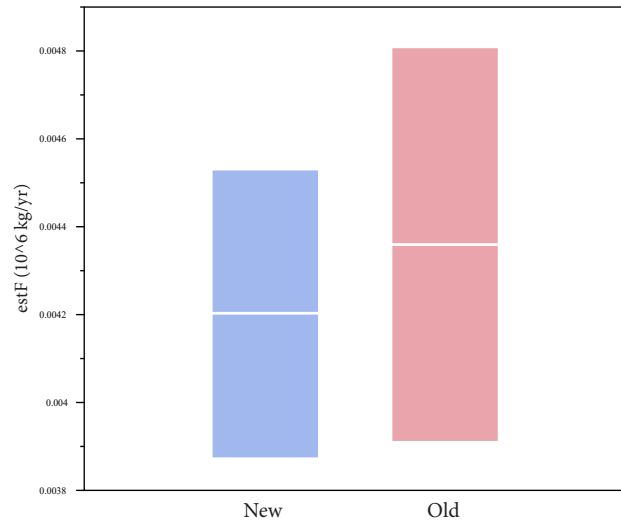
estF Distribution, Total Nitrogen



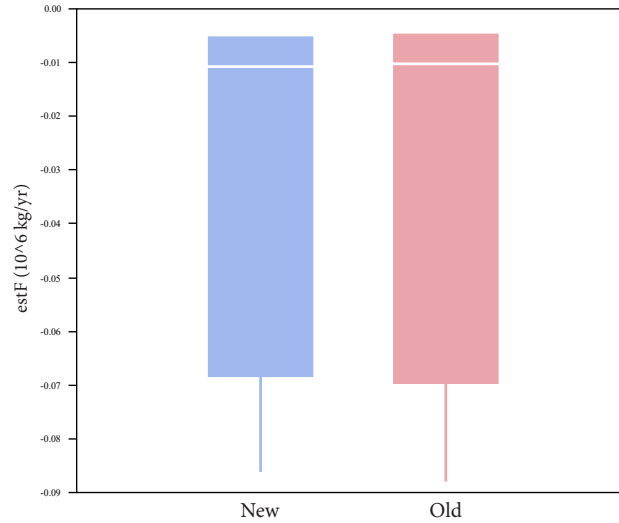
estF Distribution, Nitrate/Nitrite



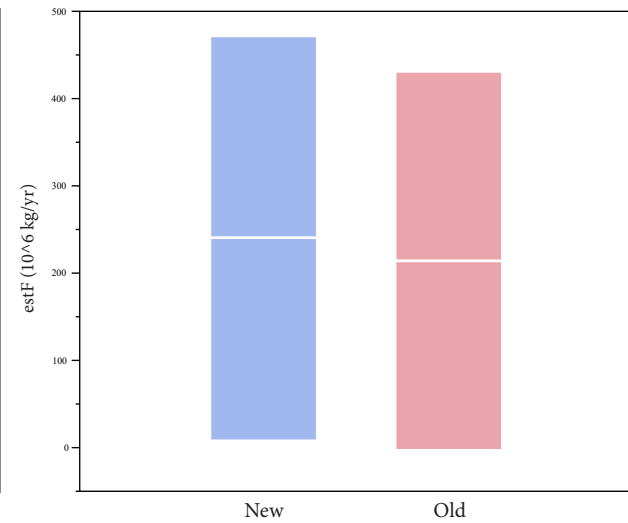
estF Distribution, Total Phosphorus



estF Distribution, Orthophosphate



estF Distribution, Sediment



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

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.

Next/current steps:

-By end of CY 2022:

- **Update ScienceBase data release (in progress)**
- **Begin new IPDS data review of updated 2020 results**
- **Update static maps, website and geonarrative (in progress)**
- **Connect with Data Dashboard team (Ruth Cassilly)**
- **Update presentations and reports**
- **Inform cooperators of revision and magnitude (in progress)**

-Within next 9-12 months:

- **Present and work with WSCs, agencies and labs to confirm and publish 1985-2022 values as a static input data release**