



**Total Maximum Daily Load
(TMDL) to Improve Water Quality of
Hammonton Creek**

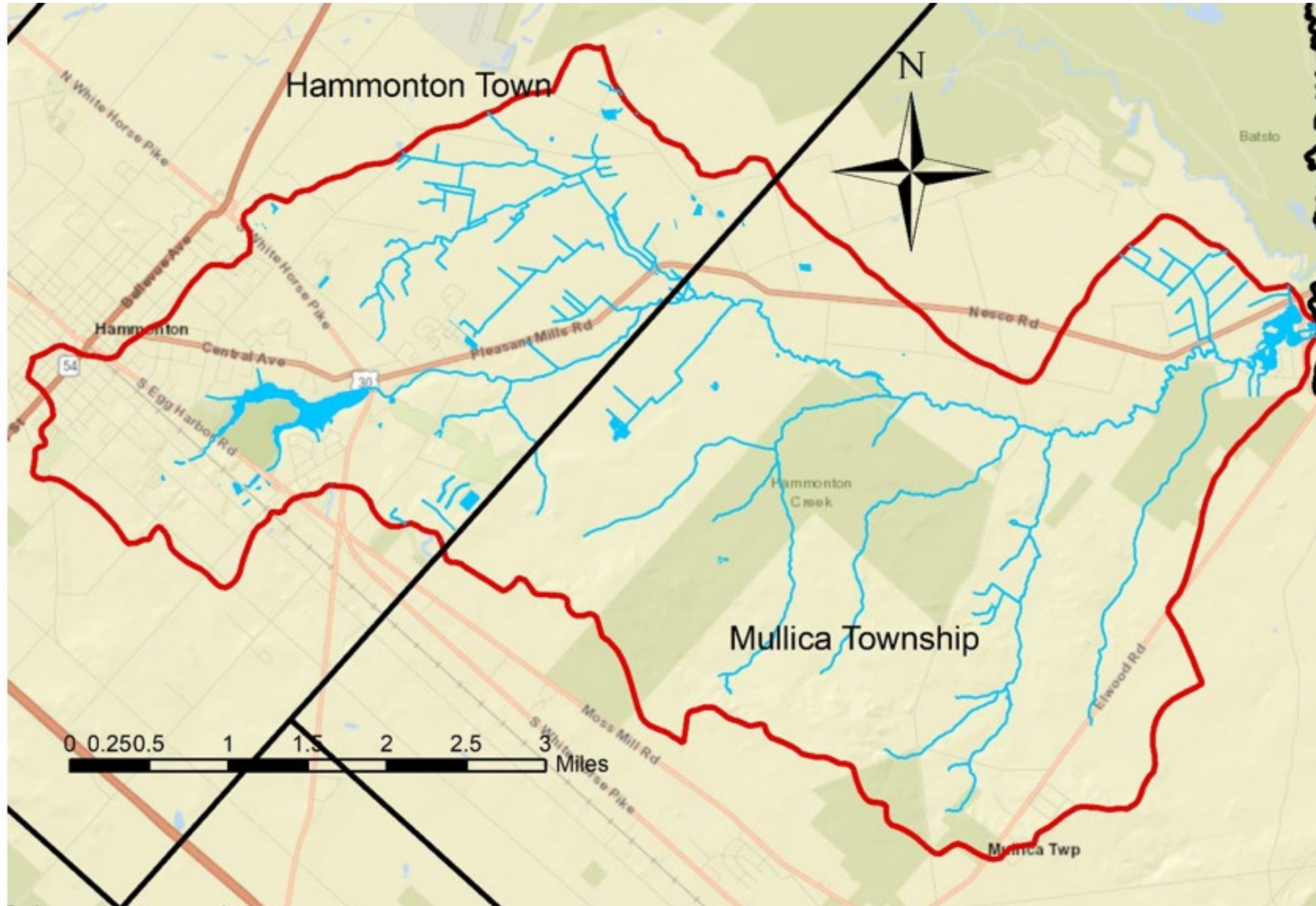


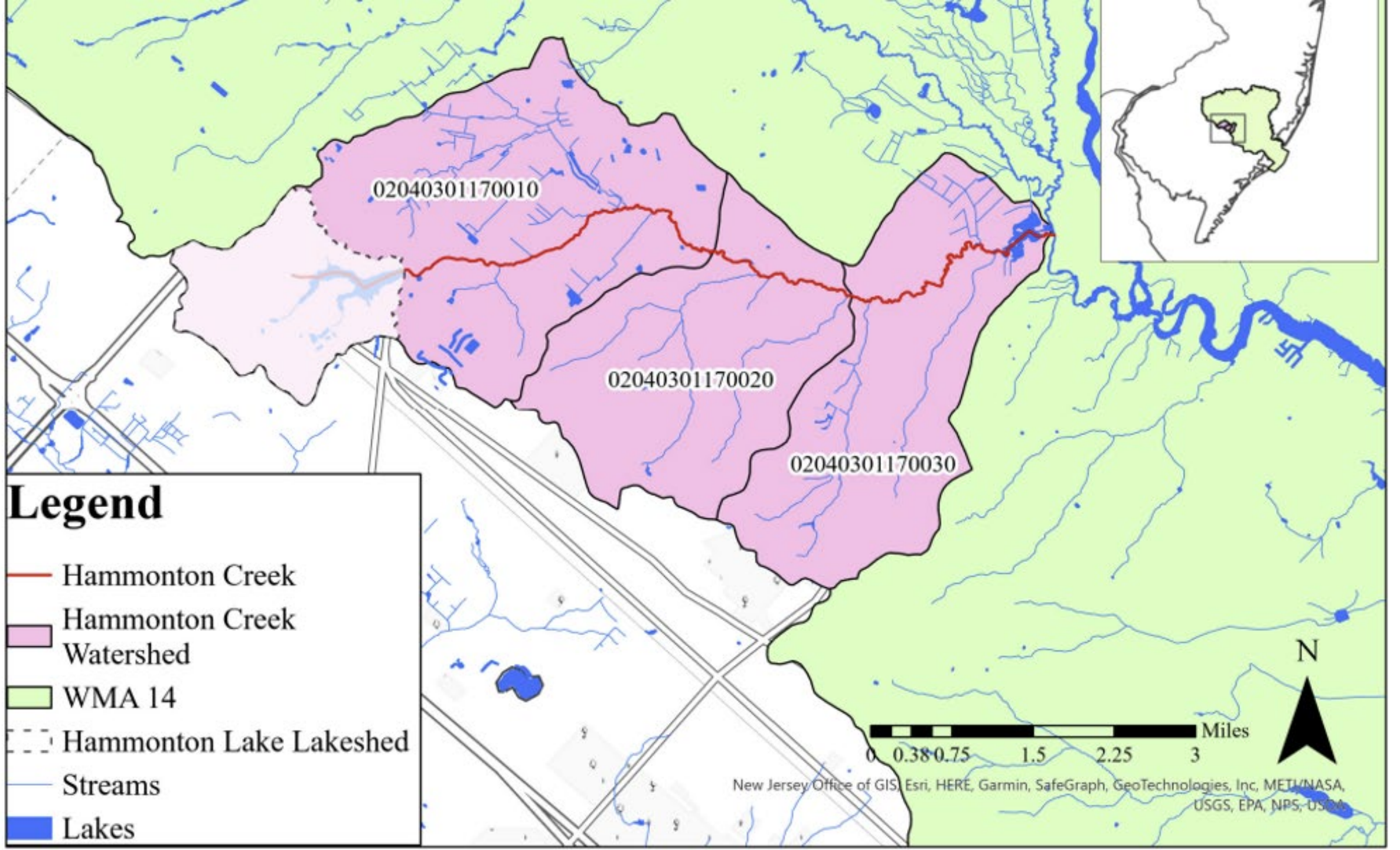
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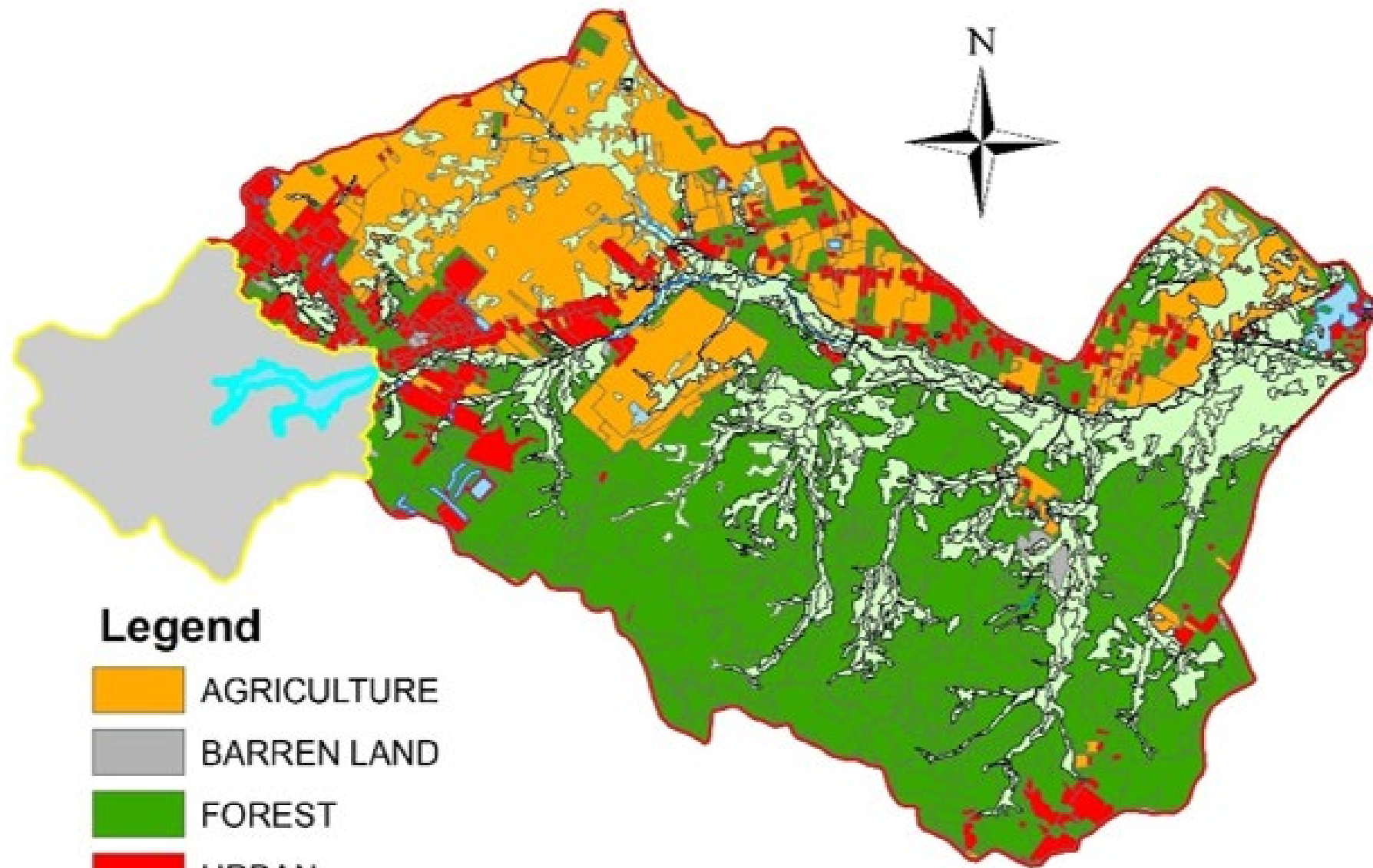


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Division of Water Monitoring, Standards and Pesticide
Control
February 26, 2024

Hammonton Creek Watershed







Legend

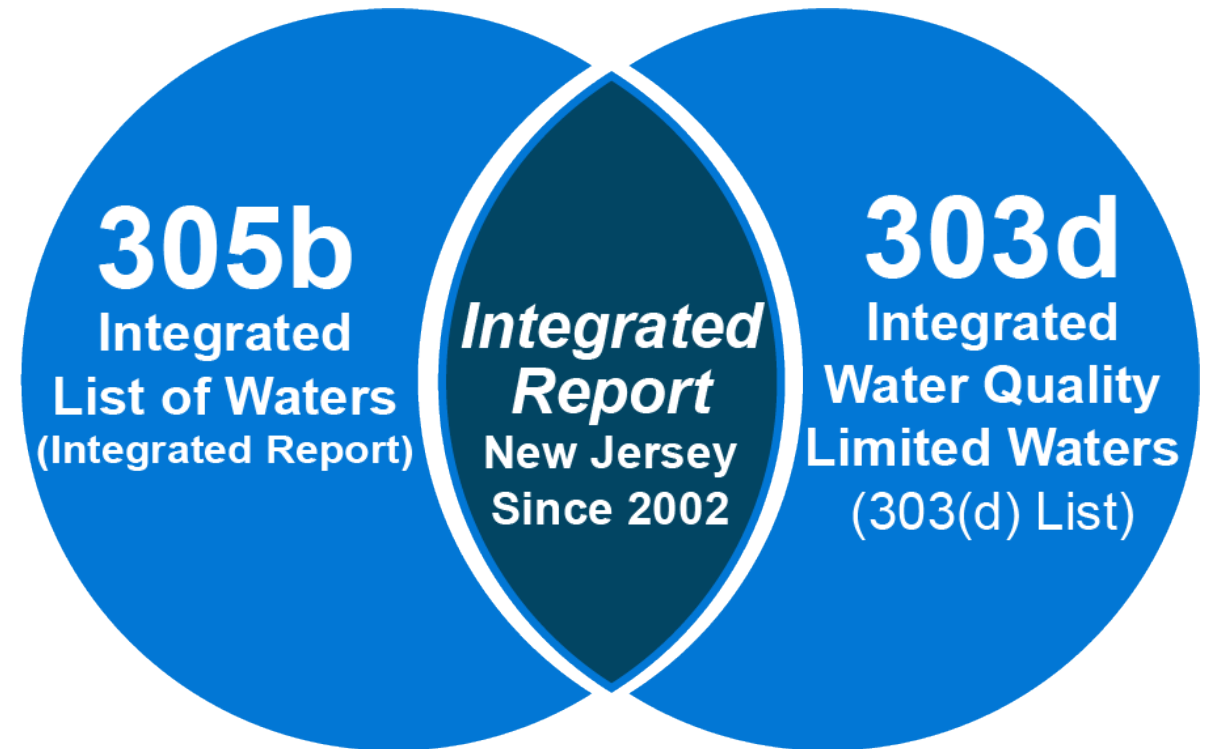
-  AGRICULTURE
-  BARREN LAND
-  FOREST
-  URBAN
-  WATER
-  WETLANDS

0 0.25 0.5 1 1.5 2 2.5 3 Miles

Waterway Assessment

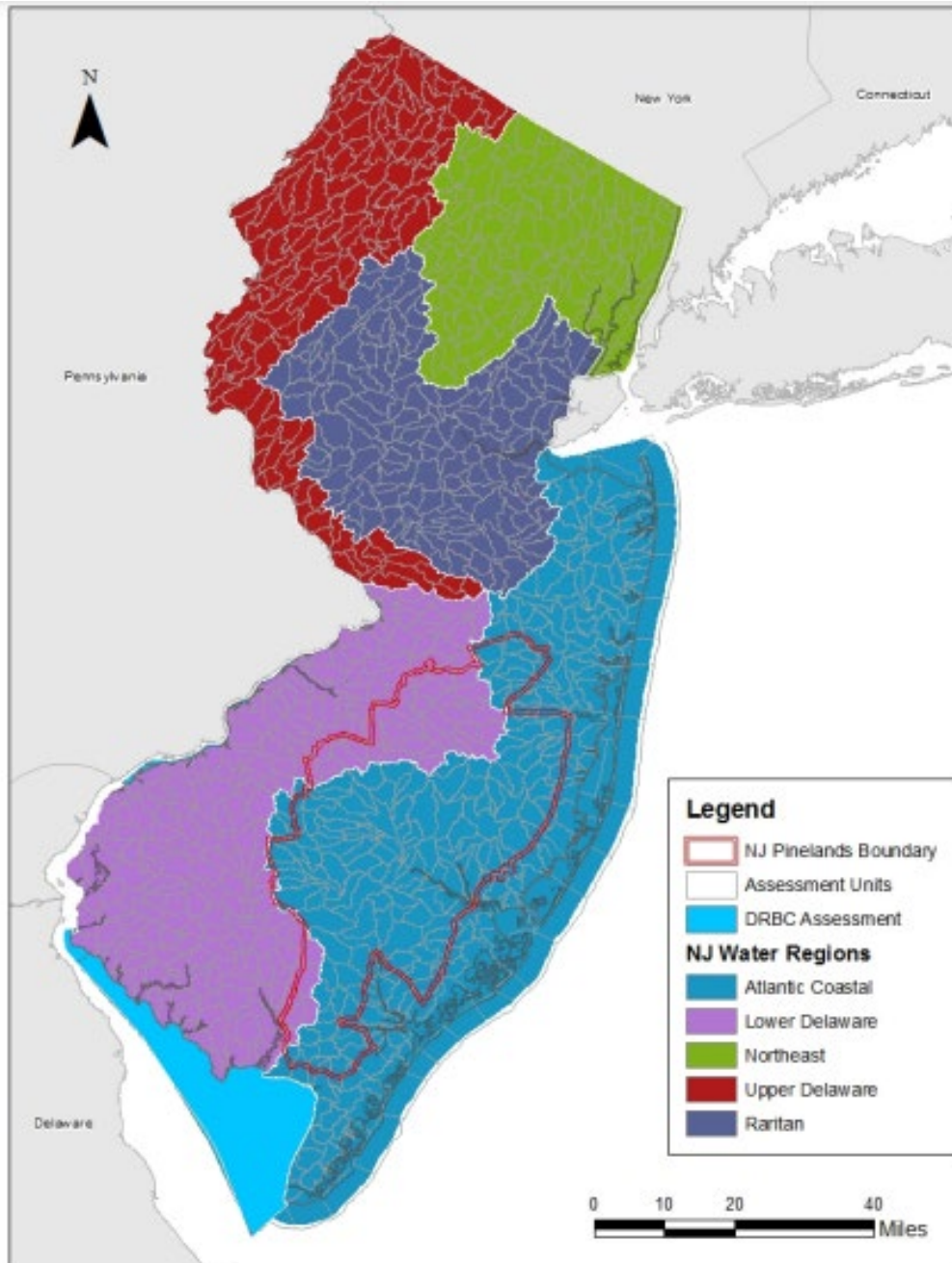
The Federal Clean Water Act mandates that states submit biennial reports to the U.S. Environmental Protection Agency (USEPA) describing the quality of their waters.

The Integrated Report (IR) serves as an effective tool for enhancing, maintaining, and restoring water quality in all surface waters of the State to support their use for aquatic life, recreation, water supply, fish consumption, and shellfish harvest for consumption.



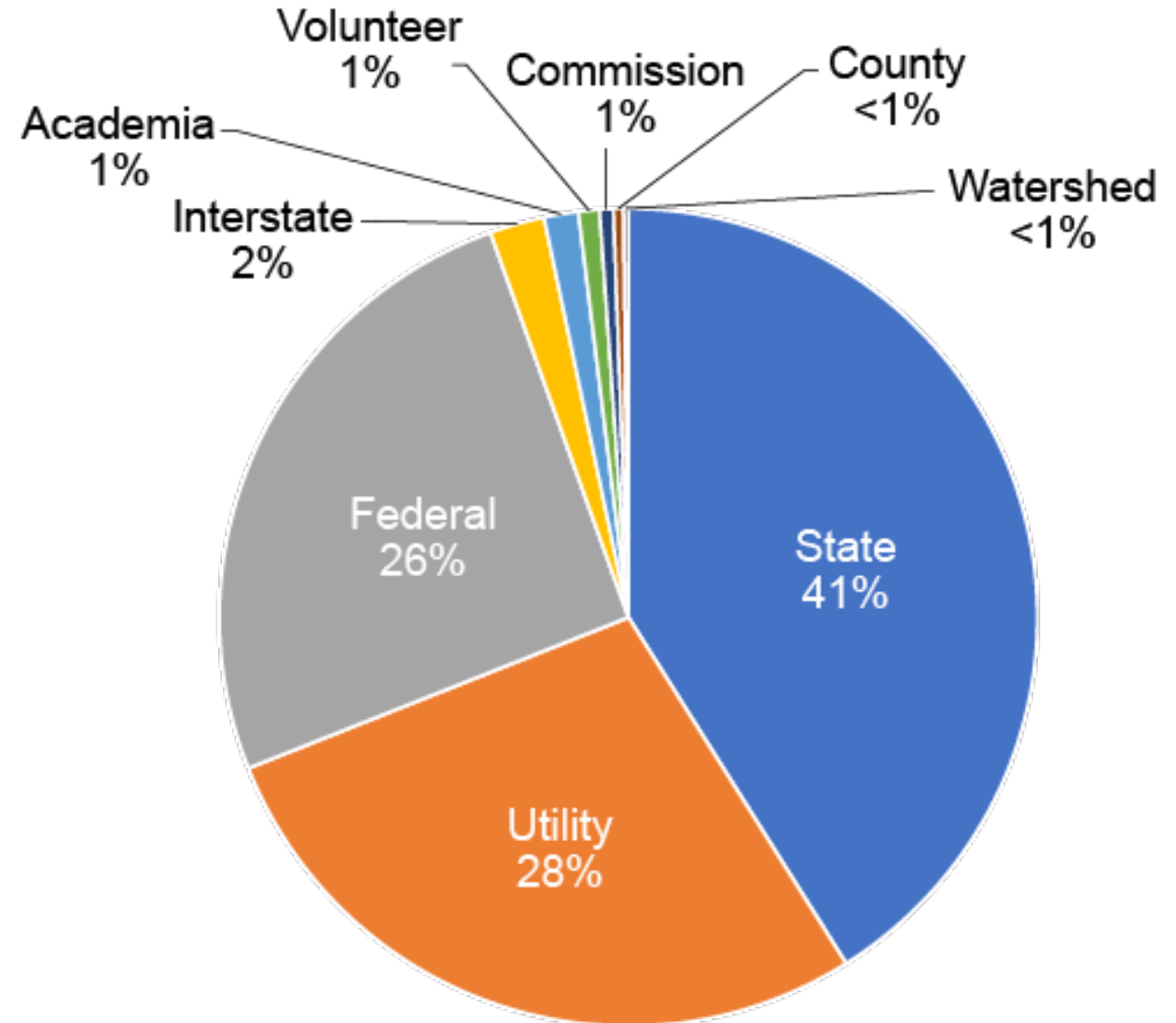
2018/2020 Water Quality Integrated Report

- 958 AUs (HUC14)
- >3.8 million data samples
- >10,000 monitoring stations
- 4,086 designated uses
- >90 parameters
- 303(d) List of Impaired Waters



Data Contributing to the Integrated Report

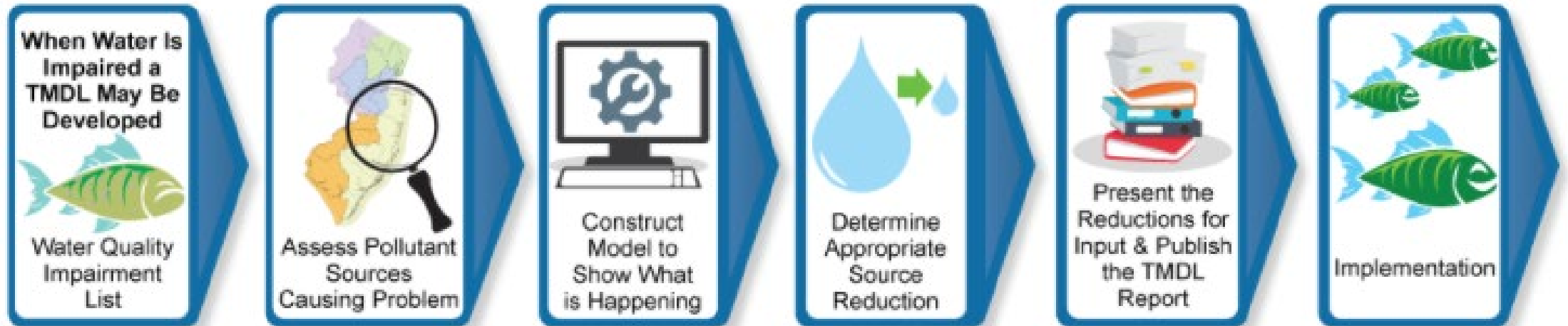
- All existing and readily available data is evaluated to ensure that it meets established data quality requirements.
- NJDEP's water quality standards (NJAC 7:9B), monitoring, and assessment programs provide the objective and scientific foundation to evaluate waterbody health.



Federal Requirement

TMDLs are required, under Section 303(d) of the federal Clean Water Act, to be developed for waterbodies that cannot meet surface water quality standards after the implementation of technology-based effluent limitations (secondary treatment).

TMDL Development Process



Water Quality Standards for Total Phosphorus

- i. Lakes: Phosphorus as total P shall not exceed 0.05 in any lake, pond, reservoir, or in a tributary at the point where it enters such bodies of water, except where site-specific criteria are developed pursuant to N.J.A.C. 7:9B-1.5(g)3.
- ii. Streams: Except as necessary to satisfy the more stringent criteria in paragraph i. above or where site-specific criteria are developed pursuant to N.J.A.C. 7:9B1.5(g)3, phosphorus as total P shall not exceed 0.1 in any stream, unless it can be demonstrated that total P is not a limiting nutrient and will not otherwise render the waters unsuitable for the designated uses.

Additional, Nutrient policies are as follows:

- Except as due to natural conditions, nutrients shall not be allowed in concentrations that cause objectionable algal densities, nuisance aquatic vegetation, abnormal diurnal fluctuations in dissolved oxygen or pH, changes to the composition of aquatic ecosystems, or otherwise render the waters unsuitable for the designated uses.

Water Quality Sampling Stations

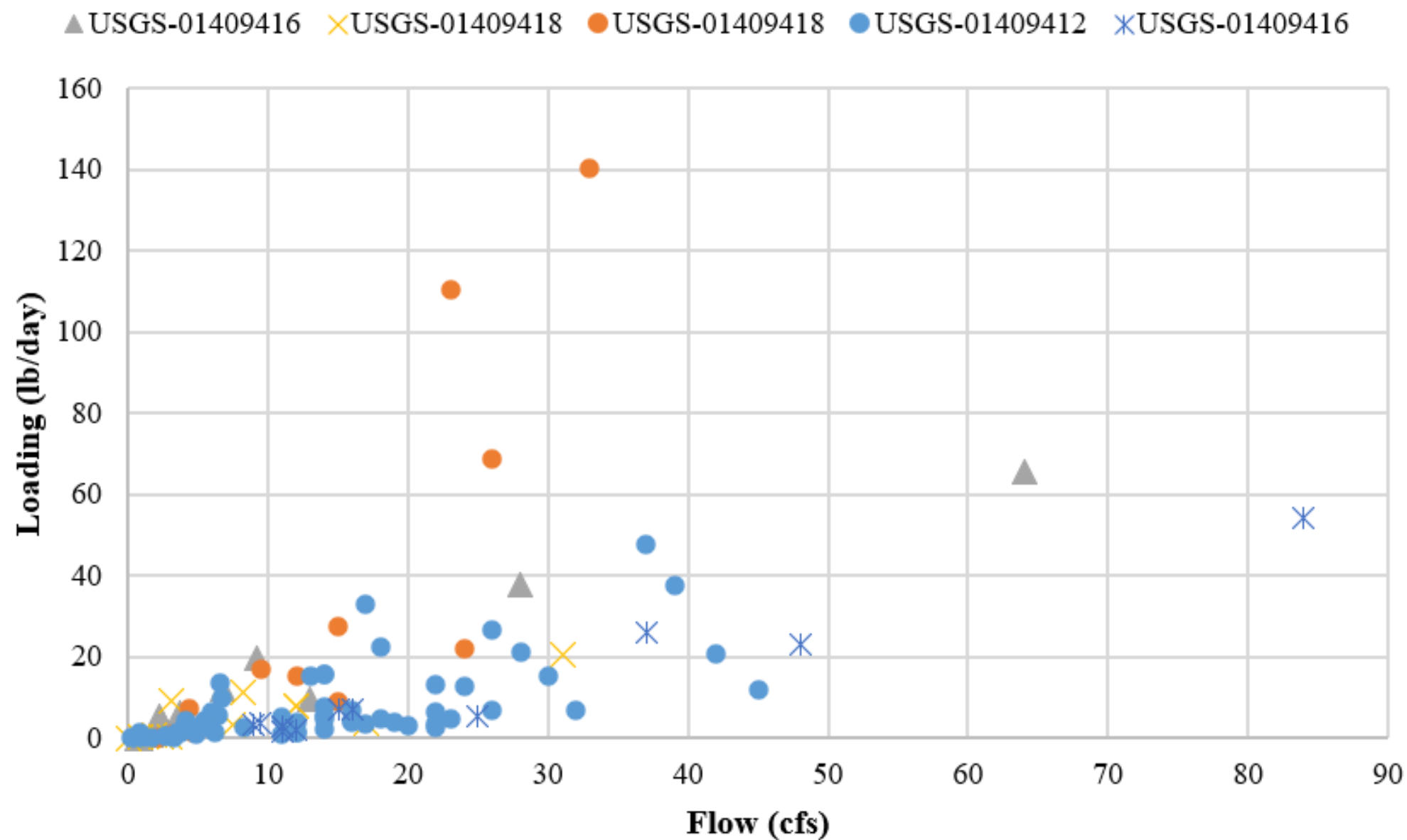


Site Number	# of Samples	Average (mg/L)	% Exceeding 0.10 mg/L
USGS-01409412	12	0.033	0.00%
USGS-01409414	12	0.243	75.00%
USGS-0140941580	12	0.201	50.00%
USGS-01409416	60	0.129	38.33%
USGS-01409418	12	0.141	66.67%
Total	108	0.140	42.59%

Station Number	Date	Time	Flow (ft³/sec)	TP (mg/L)
01409416	2/14/2008	11:30	64	0.19
01409416	5/21/2008	10:30	28	0.25
01409416	8/25/2008	11:30	3.7	0.31
01409414	9/17/2008	10:45	2.2	0.44
0140941580	9/17/2008	11:45	2.3	0.15
01409416	9/17/2008	12:30	9.2	0.4
01409418	9/17/2008	13:30	13	0.14
01409414	10/8/2008	11:00	2.3	0.36
01409416	10/8/2008	14:00	6.8	0.33
01409418	10/8/2008	15:00	12	0.12
01409416	12/3/2008	11:50	31	0.123
01409416	2/17/2009	11:30	12	0.12
01409414	5/26/2009	11:10	3.1	0.56
01409416	5/26/2009	13:45	8.2	0.26
01409418	5/26/2009	15:00	15	0.11
01409416	6/1/2009	9:30	12	0.24
01409414	6/16/2009	11:15	4.3	0.32
01409416	6/16/2009	14:15	15	0.34
01409418	6/16/2009	15:00	24	0.17
01409414	7/21/2009	11:15	9.5	0.33
0140941580	7/21/2009	13:15	23	0.89
01409416	7/21/2009	15:15	33	0.79

Station Number	Date	Time	Flow (ft³/sec)	TP (mg/L)
01409414	8/12/2009	11:15	5.9	0.21
0140941580	8/12/2009	13:15	6.7	0.27
01409416	8/12/2009	15:00	18	0.23
01409418	8/12/2009	14:00	28	0.14
01409416	8/18/2009	11:20	14	0.21
01409414	9/3/2009	10:15	4.1	0.16
01409416	9/3/2009	14:15	13	0.22
01409418	9/3/2009	13:15	22	0.11
01409414	9/23/2009	11:00	6.4	0.16
0140941580	9/23/2009	13:00	17	0.36
01409418	9/23/2009	14:00	39	0.18
01409416	9/23/2009	15:00	37	0.24
01409416	6/17/2010	11:50	14	0.21
0140941580	7/12/2010	12:30	0.76	0.3
01409416	7/12/2010	13:35	6.6	0.38
0140941580	8/10/2010	13:15	0.15	0.13
01409416	8/10/2010	14:15	4.1	0.19
01409414	10/7/2010	10:15	5.4	0.15
01409416	8/4/2011	11:00	26	0.19
01409416	6/12/2012	11:20	4.1	0.12
01409416	5/21/2013	11:20	14	0.101
01409416	12/17/2018	10:30	84	0.12

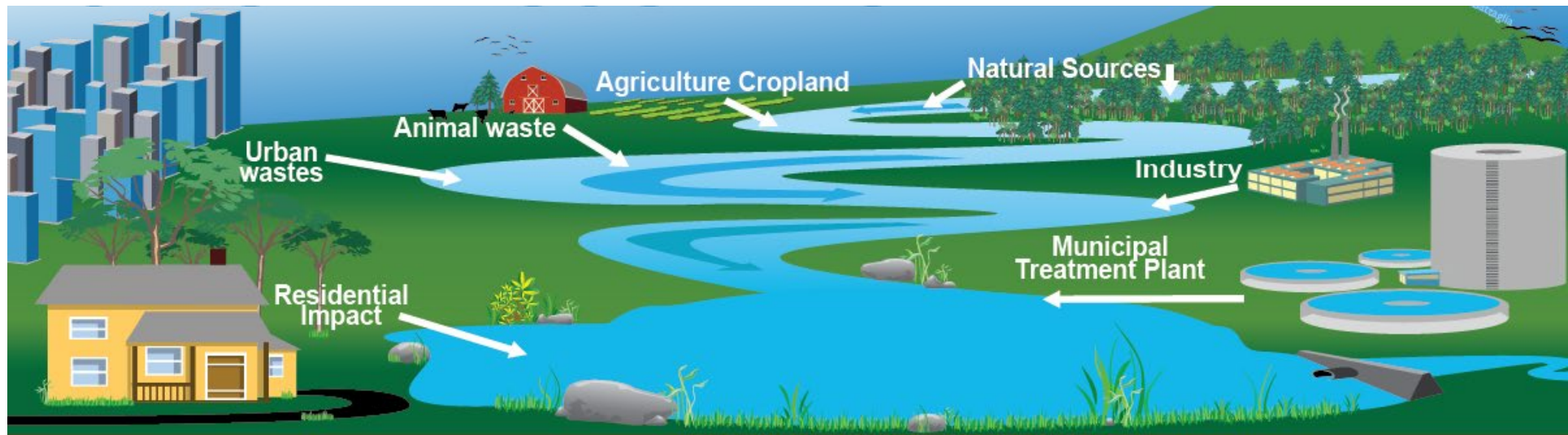
Observed TP Loadings by Sampling Site



What are TMDLs?

Total Maximum Daily Loads (TMDLs) provide the regulatory framework to specify the reductions needed to attain the water quality target, taking into consideration:

- Point sources of pollutants (WLA – Waste Load Allocation) - NJPDES permittees
- Nonpoint sources of pollutants (LA – Load Allocation)
- Margin of Safety (MOS)
- Reserve Capacity (RC)



Required Components of a TMDL Report

1. Source assessment
 - Characterization and quantification as necessary
 - Point, nonpoint and background
2. Water quality analysis
 - Select endpoint
 - Link pollutant sources and water quality
 - Seasonal variation / critical conditions
3. TMDL calculations
 - Loading capacity
 - Margin of safety
 - Load and wasteload allocations
4. Follow-up monitoring
5. Implementation
6. Public participation



1. Source assessment

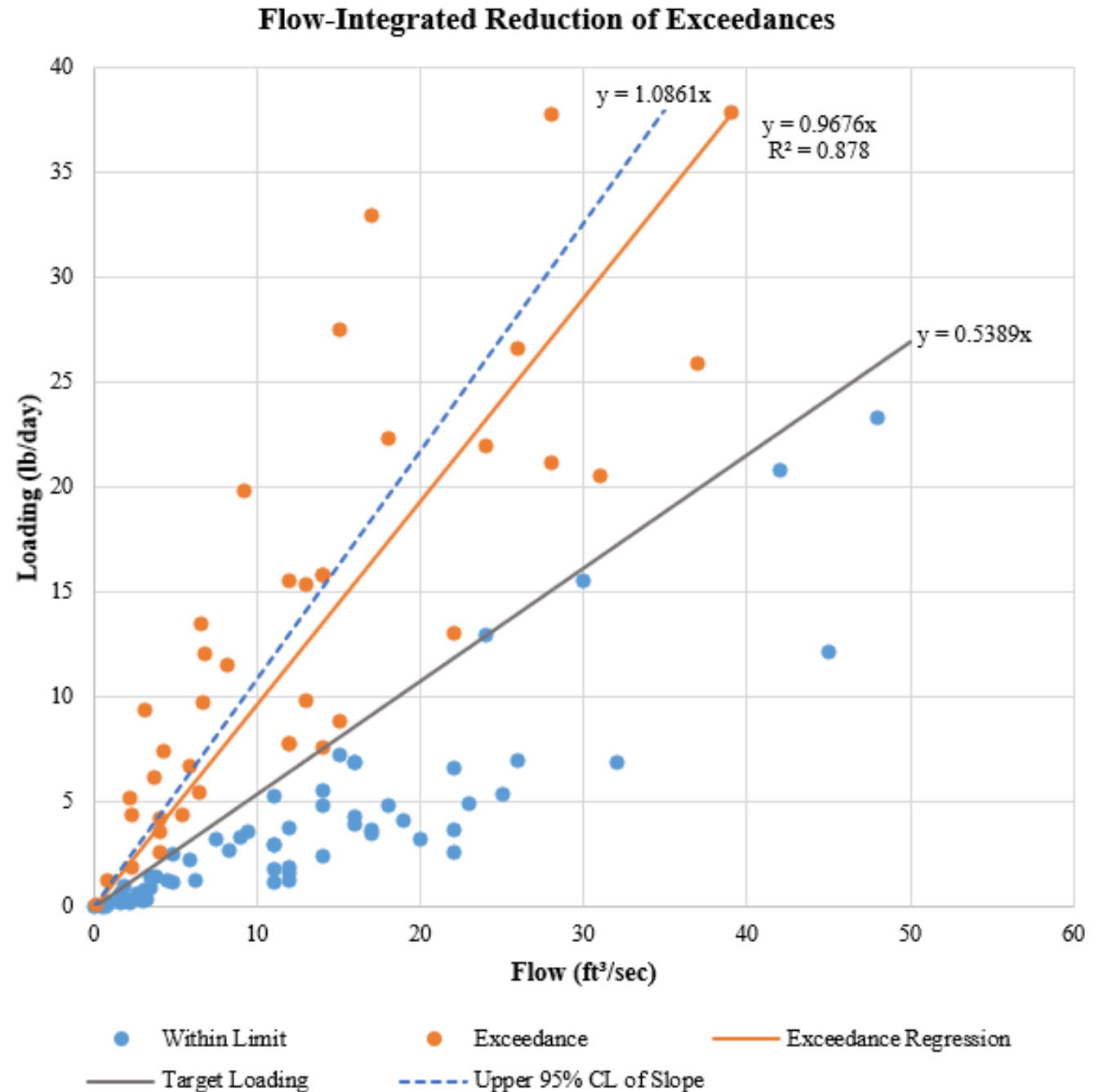
Land use/Land cover	Acres (acres)	Acres (%)
Agriculture	2,368.8	20.3%
Barren Land	36.0	0.3%
Forest	5,135.8	44.1%
Urban	1,078.2	9.3%
Water	124.8	1.1%
Wetlands	2,906.4	24.9%
Total	11,650.0	100.0%

Land use / land cover	LU/LC codes*	UAL (kg TP/ha/yr)
Mixed density residential	1100	1.2
Medium / high density residential	1110, 1120, 1150	1.6
Low density / rural residential	1130, 1140	0.7
Commercial	1200	2.0
Industrial	1300, 1500	1.7
Mixed urban / other urban	other urban codes	1.0
Agricultural	2000	1.5
Forest, Wetland, Water	1750, 1850, 2140, 2150, 4000, 6000, 5000, 8000	0.1
Barren land	7000	0.5

Units:
1 hectare (ha) = 2.47 acres
1 kilogram (kg) = 2.2 pounds (lbs)
1 kg/ha/yr = 0.89 lbs/acre/yr

Land Use	Current Load
	TP (lbs/yr)
Agriculture	3,079.47
Barren Land	17.99
Forest	513.58
Urban	1,033.79
Water	12.48
Wetlands	290.64
Total	4,947.96

2. Water quality analysis



3. TMDL calculations

Percent Total Phosphorus Loading Reduction based on regression line:

$$\left(1 - \frac{0.5389}{0.9921}\right) * 100\% = 45.68\%$$

The portion of the reduction attributed to Margin of Safety (MOS) is calculated as follows:

$$\left(1 - \frac{0.9921}{1.1475}\right) * 100\% = 13.55\%$$

	Current Load	Load Capacity			% reduction
	TP (lbs/yr)	TP (lbs/yr)	TP (lbs/day)	% of LC	
Agriculture	3,079.47	1,125.08	3.08	18.7%	66%
Barren Land	17.99	23.92	0.07	0.4%	0%
Forest	513.58	511.35	1.40	40.8%	0%
Urban	1,033.79	370.91	1.02	15.7%	66%
Water	12.48	12.18	0.03	1.5%	0%
Wetlands	290.64	290.94	0.80	22.8%	0%

4. Follow-up monitoring

- ***NJDEP and USGS continues to monitor water quality***

5. Implementation

- ***Watershed Restoration and Protection Plan***
- ***Federal, State, and Local Funding***

6. Public participation

Hammonton Creek Watershed Restoration and Protection Plan

- Nutrient Management Plans for agricultural lands
- Vegetative buffers along agricultural lands
- Additional street sweeping and leaf collection
- Retrofit existing development with green infrastructure
- Rain gardens for residential and commercial properties
- Bioswales along roadways
- Naturalize existing detention basins

Timeline for TMDL

- Draft TMDL submitted to NJDEP by March 15, 2024
- NJDEP provide Rutgers comments by March 30, 2024
- TMDL is finalized by Rutgers by April 15, 2024
- TMDL proposed as an amendment to the Atlantic County Water Quality Management Plan - posted in NJ Register July 1, 2024 for 30-day public comment period (tentative)
- TMDL comment period closes 30 days after NJR publication
- TMDL submitted to EPA for approval by August 30, 2024 (tentative)

Timeline for Watershed Restoration and Protection Plan (WRPP)

- Draft WRPP complete March 1, 2024
- Meeting with Hammonton Environmental Commission on March 13, 2024 to solicit input to plan
- Draft WRPP submitted to NJDEP March 30, 2024
- NJDEP provides Rutgers comments on plan by April 30, 2024
- Rutgers address comments and revises plan by May 30, 2024
- NJDEP reviews and approves plan by July 31, 2024 (tentative)



Questions?

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- Deborah Kratzer (deborah.kratzer@dep.nj.gov)

THANK YOU