Black River Watershed – Tributary Monitoring, 2024

2025 Black River Watershed Conference
June 3, 2025

Andrew Brainard, PhD

Photo by Emily Fell, NYSDEC.

Overview

- Background on project
- Approach to 2024 monitoring
- Results
  - Comparison among sites
- Recap and looking ahead

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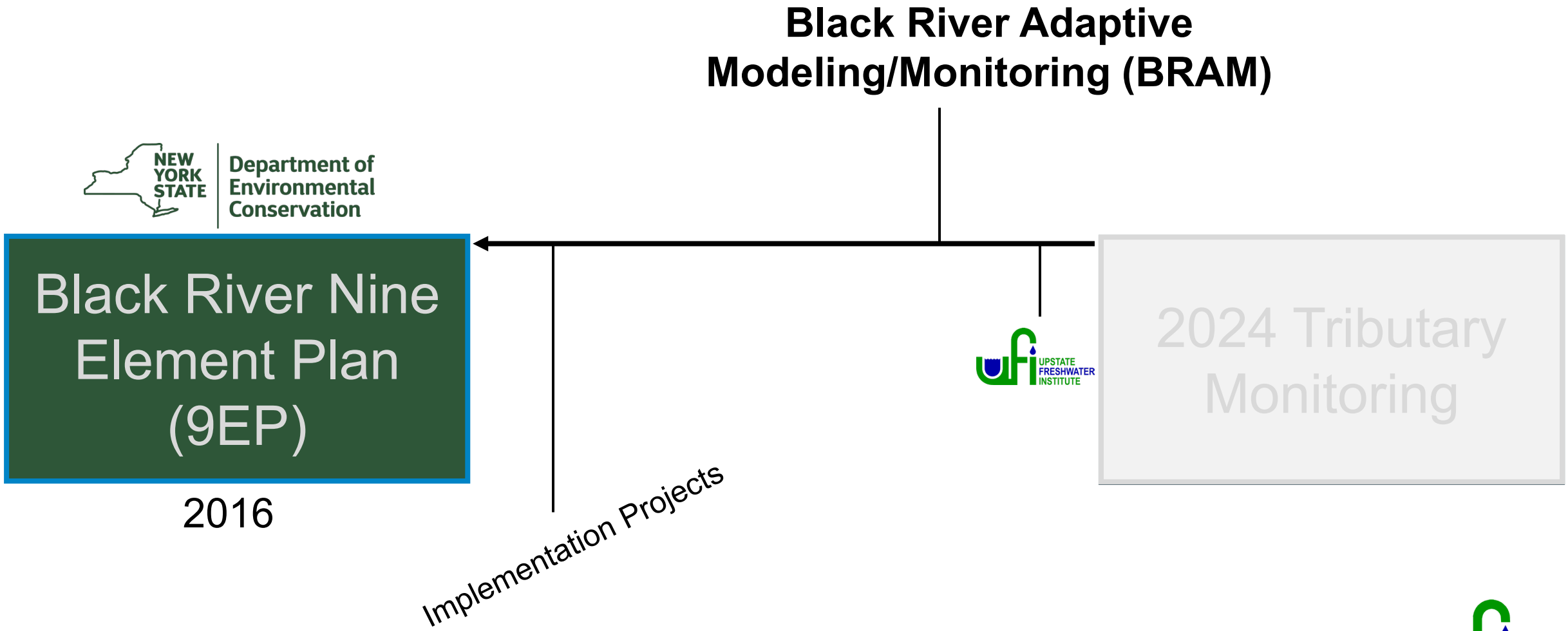
Project Background



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Project Background

Black River Adaptive Modeling/Monitoring (BRAM)

GOALS:

- Compile available datasets
- Receive input on new water quality concerns
- Identify spatial and quantitative data gaps
- Recommend additional water quality monitoring
- Identify new actions and projects to improve or protect water quality
- Track implementation of projects

→ 2024 Tributary Monitoring

NEW YORK STATE Department of Environmental Conservation

RAMBOLL Bright ideas. Sustainable change.

CC Environment & Planning

New York State Tug Hill Commission

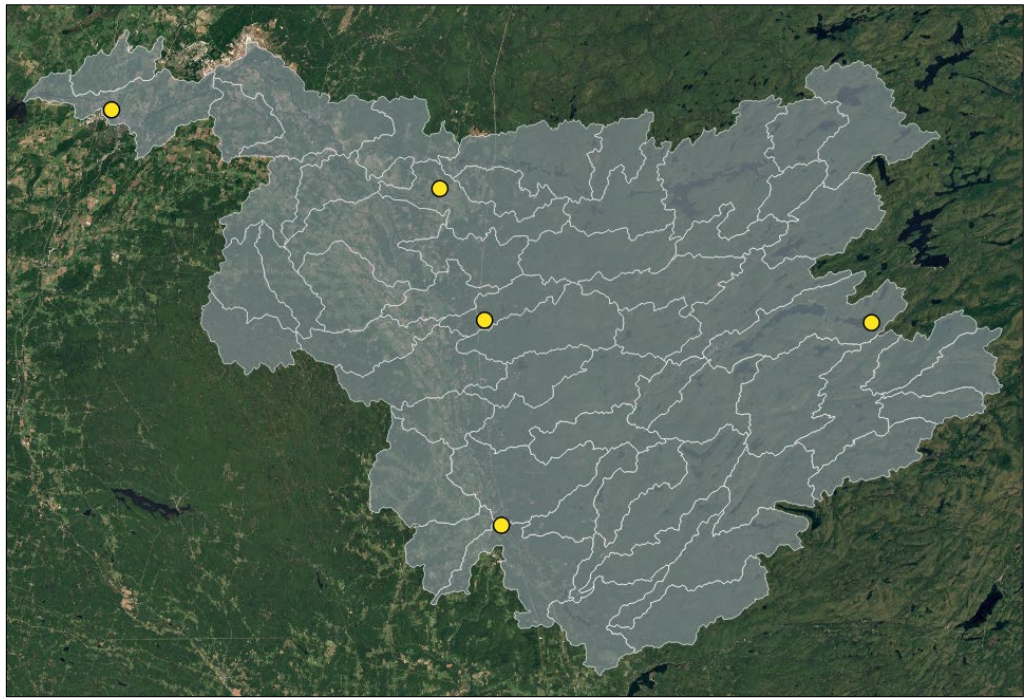
Black River Clean water starts with you

UFI Upstate Freshwater Institute

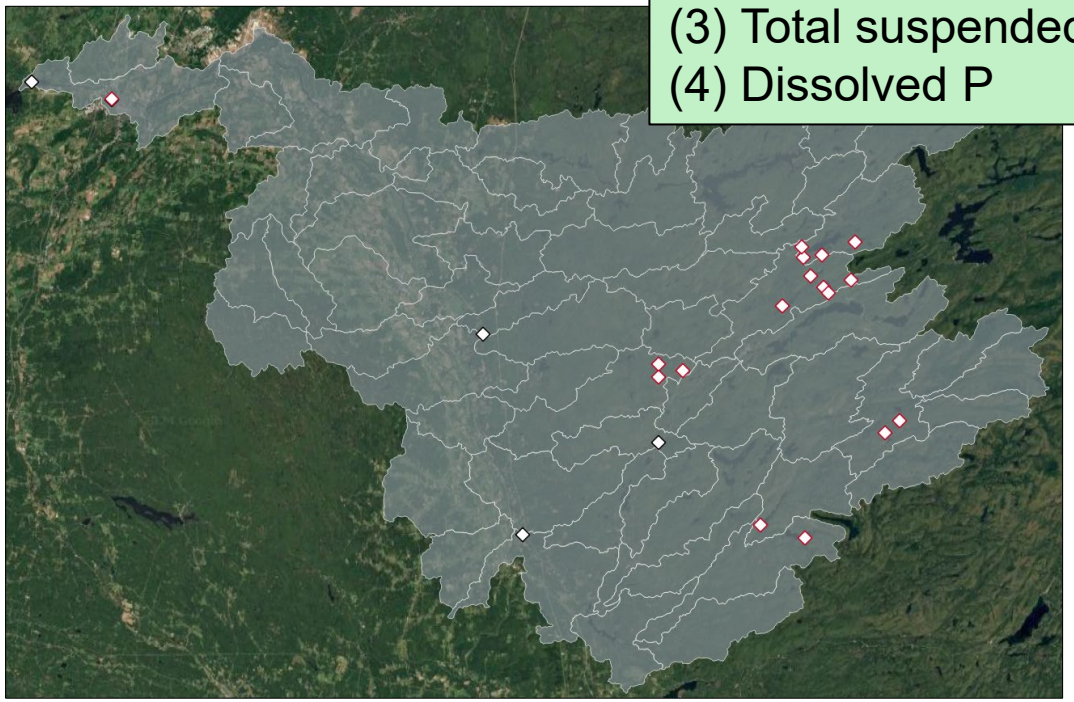
Project Background

Information learned from Data Gap Analysis

USGS Flow Gages ✓



Historic Water Quality



◇ = USGS WQ site

◇ = NYSDEC WQ site

Data gaps:
(1) Spatial
(2) Total N
(3) Total suspended solids
(4) Dissolved P

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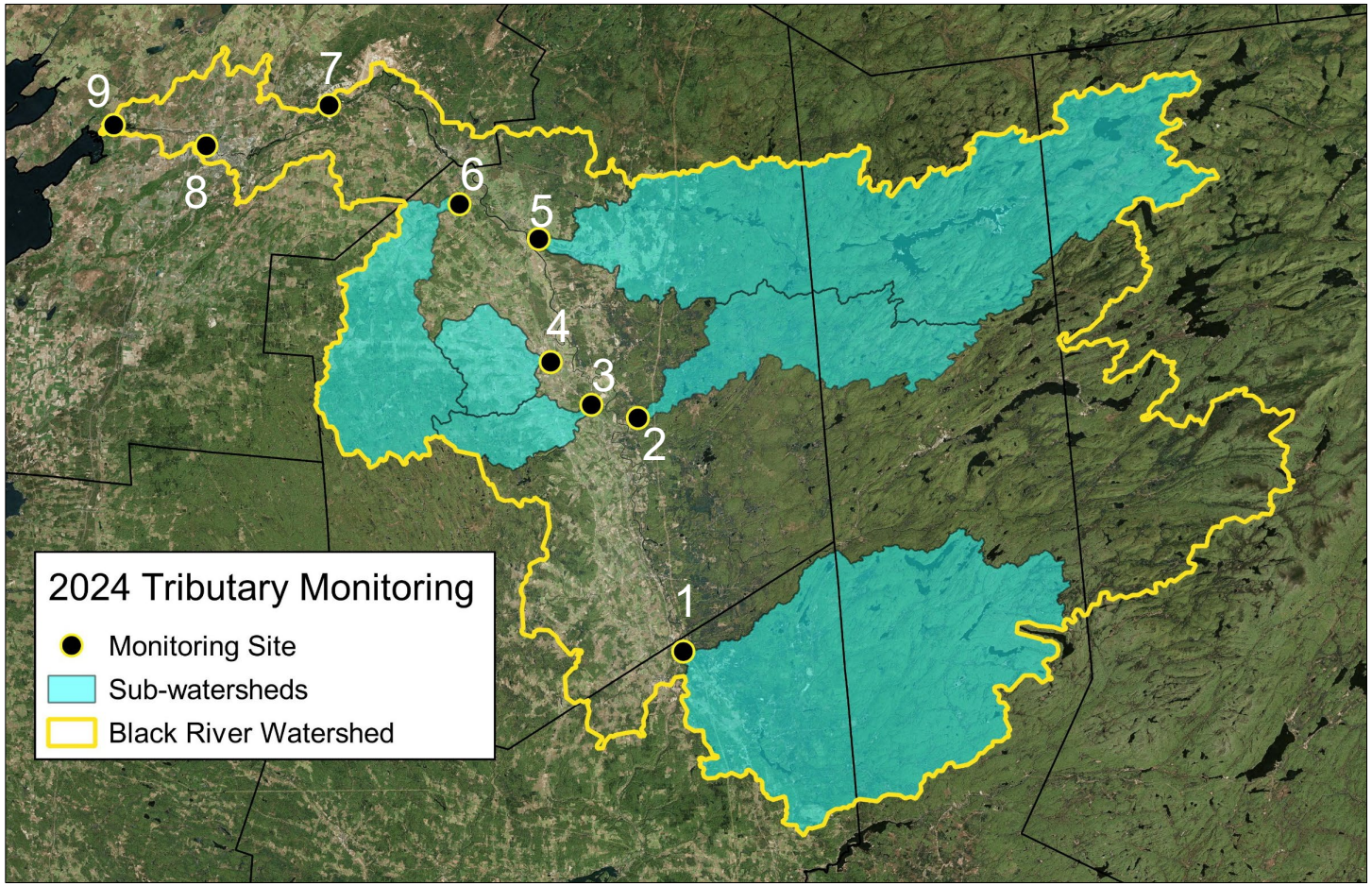
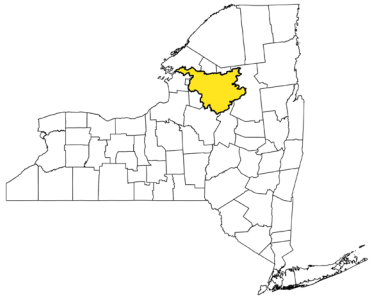
2024 Monitoring Approach

Site	Name
1	Black River (Oneida Co.)
2	Independence River
3	Roaring Brook
4	Mill Creek
5	Beaver River
6	Deer River
7	Black River – upstream
8	Black River – mid
9	Black River - downstream





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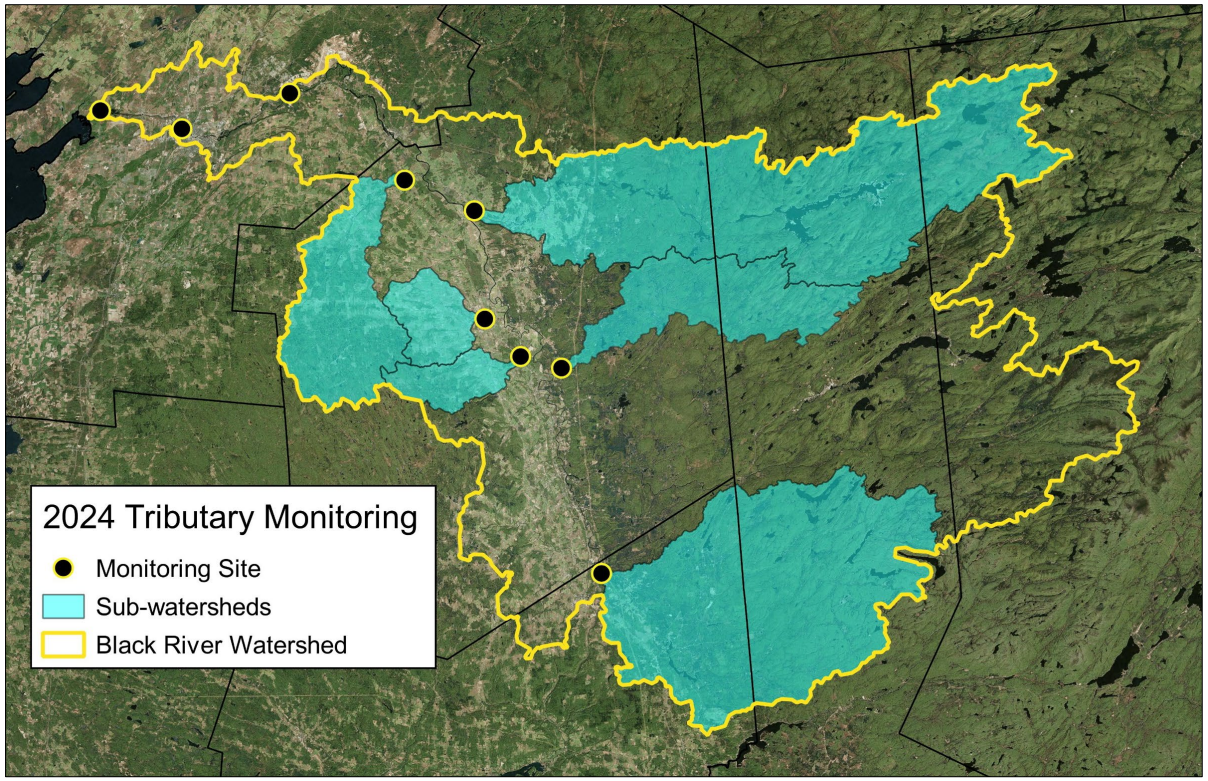
2024 Monitoring Approach

Sampling bi-monthly, May – November

- Total suspended solids (TSS)
- Total nitrogen (TN)
- Total phosphorus (TP)
- Total dissolved phosphorus (TDP)

- Temperature (°C), pH, specific conductivity (µS/cm), turbidity (NTU), dissolved oxygen (mg/L; % saturation)



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2024 Monitoring Approach

Capacity building

Virtual training – Oct. 2023

Field trainings (2) – Nov. 2023

Soil & Water Conservation Districts (SWCDs):

- Oneida
- Lewis
- Jefferson
- Hamilton

Tug Hill Commission

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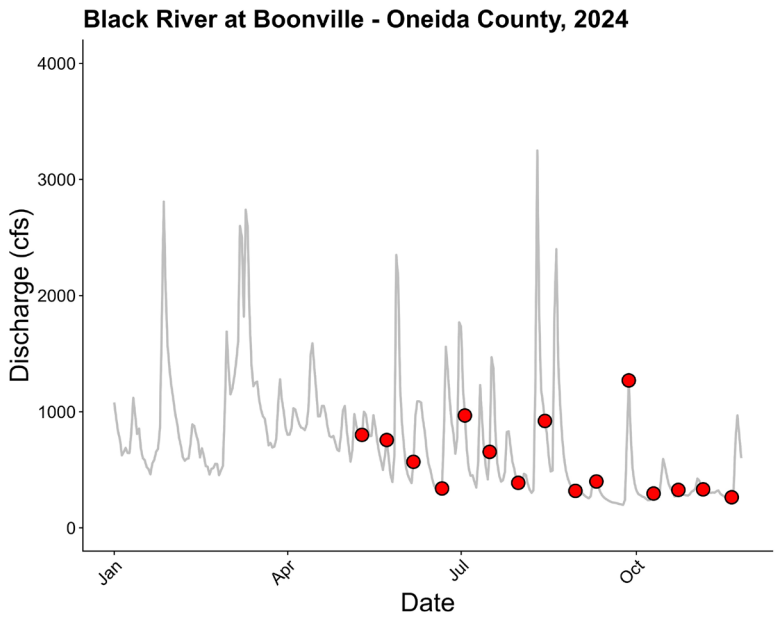
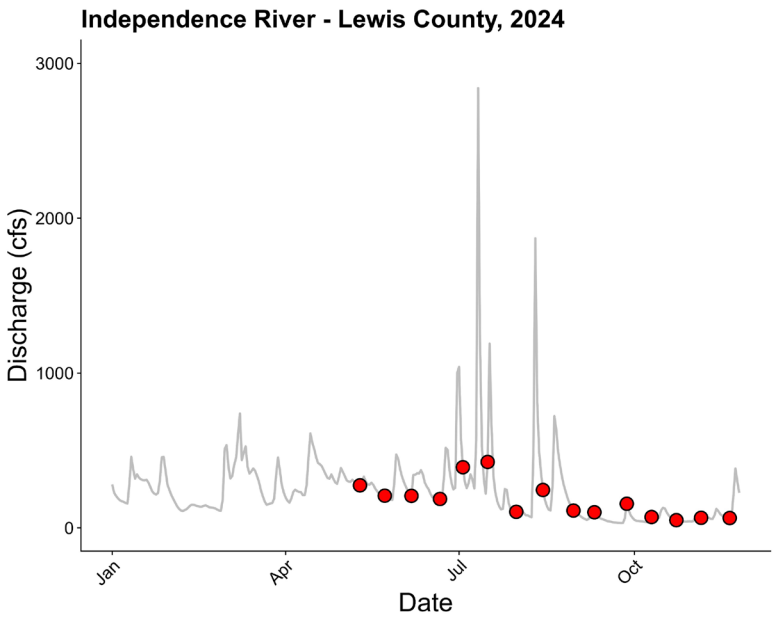
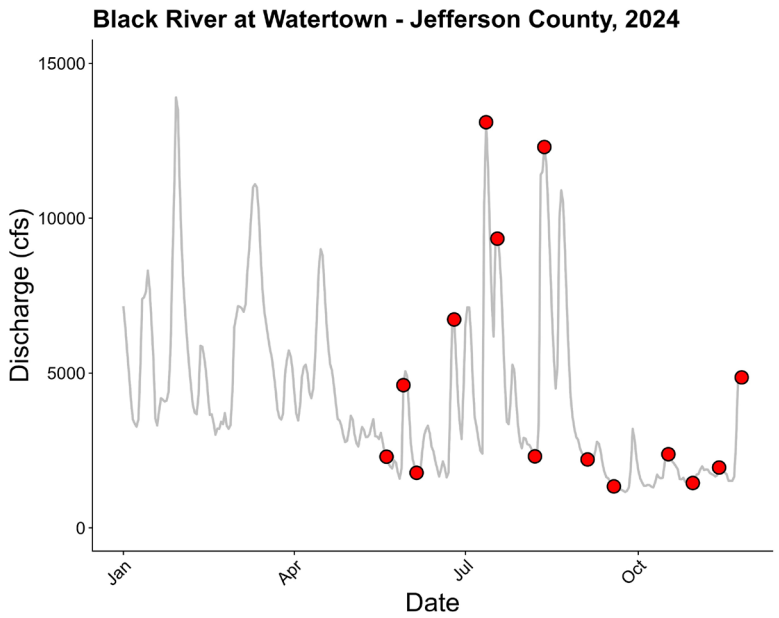
RESULTS

The importance of flow during monitoring …







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RESULTS

(1) Total suspended solids (TSS)

(2) Total nitrogen (TN)

(3) Total phosphorus (TP)

(4) Total dissolved phosphorus (TDP)

Concentration of solid particles suspended in water (e.g., sediment, algae, organic matter, debris)

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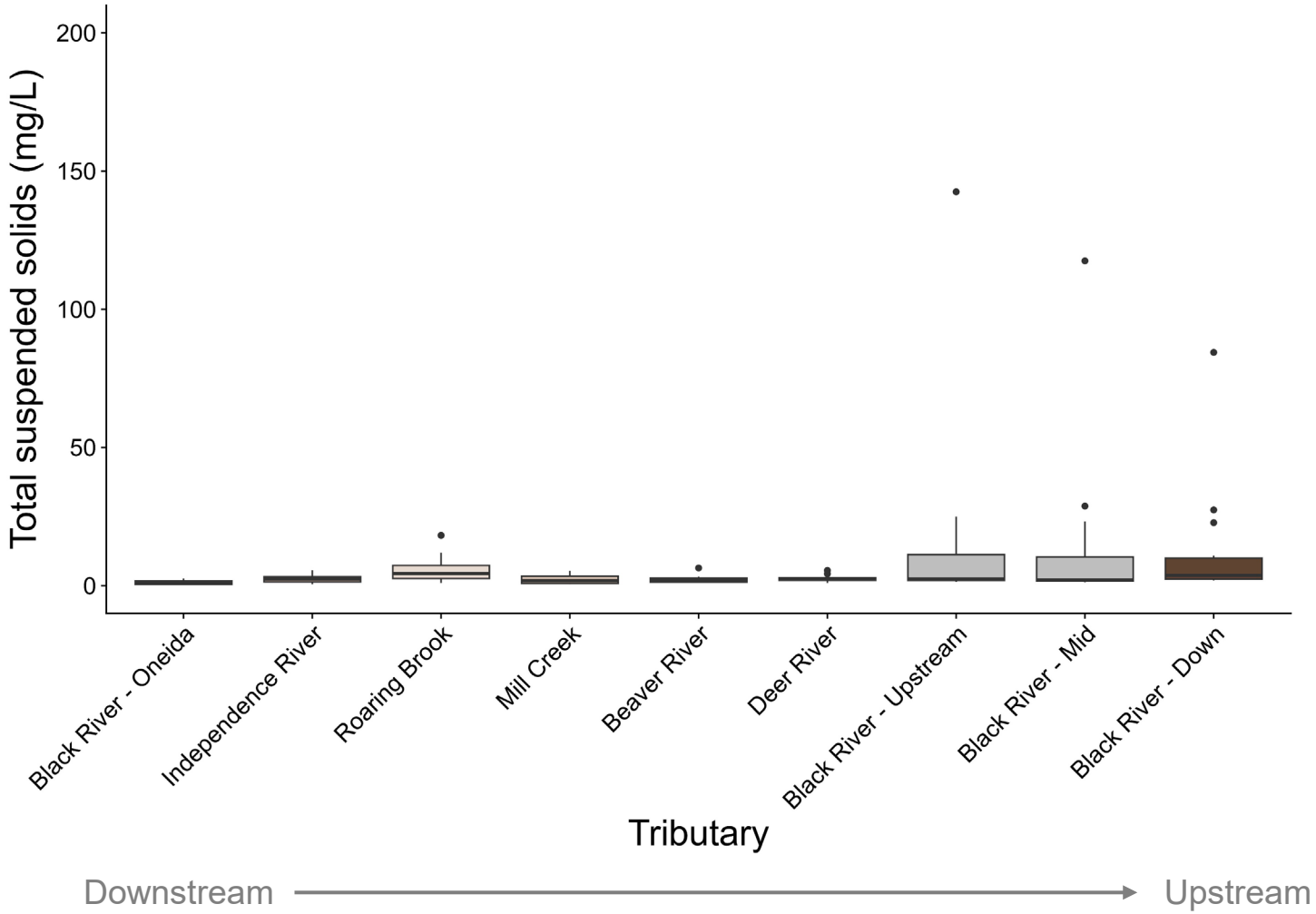
RESULTS

Total suspended solids (TSS)



Mean TSS concentrations similar among sites

Concentrations relatively low

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RESULTS

(1) Total suspended solids (TSS)

(2) Total nitrogen (TN)

(3) Total phosphorus (TP)

(4) Total dissolved phosphorus (TDP)

Sum of all nitrogen forms present in water

N is nutrient for primary production

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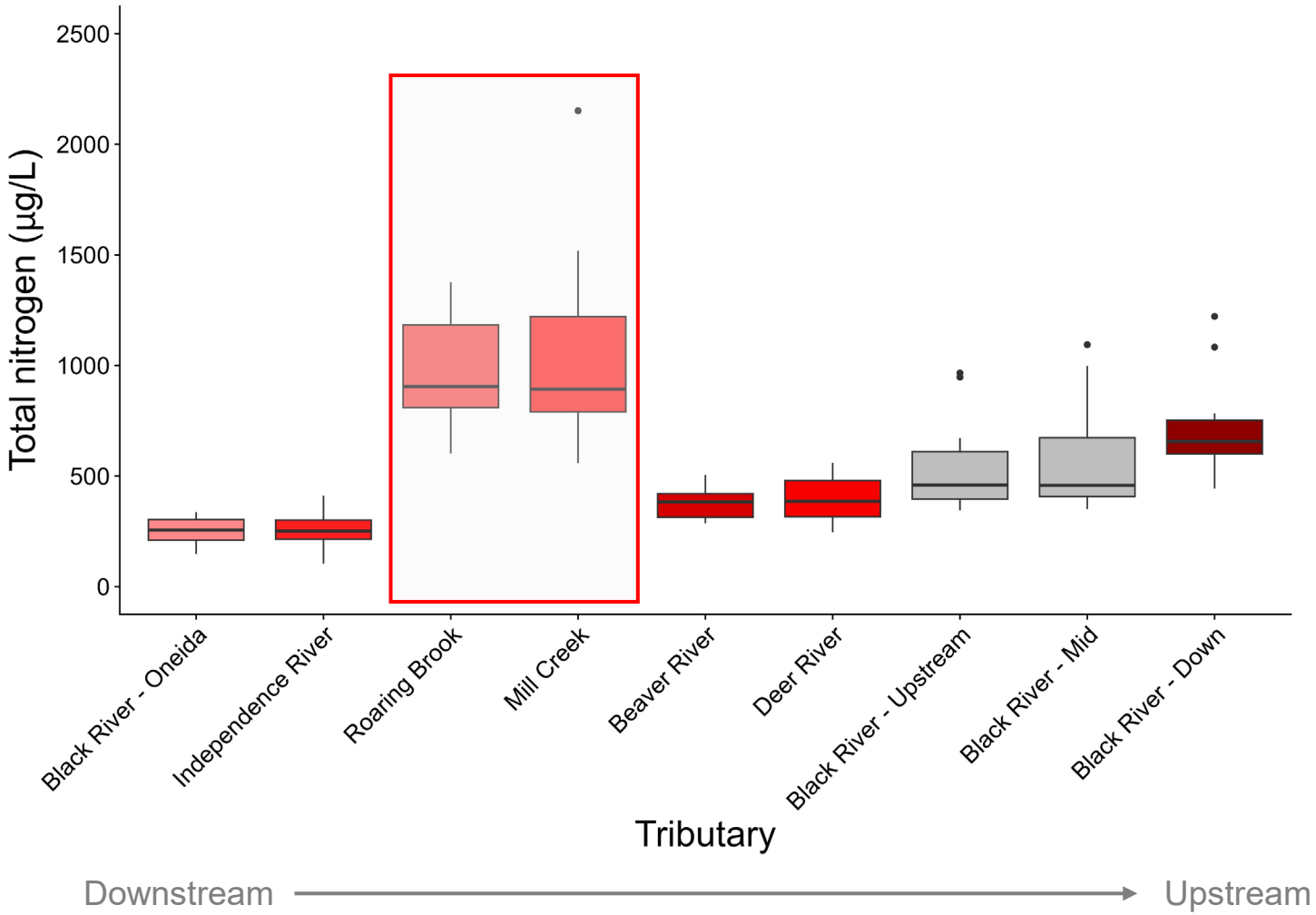
RESULTS

Total nitrogen (TN)



Potential differences among sites

TN concentrations generally low

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RESULTS

(1) Total suspended solids (TSS)

(2) Total nitrogen (TN)

(3) Total phosphorus (TP)

(4) Total dissolved phosphorus (TDP)

Sum of all phosphorus forms present in water

P is often limiting nutrient for productivity in freshwater systems

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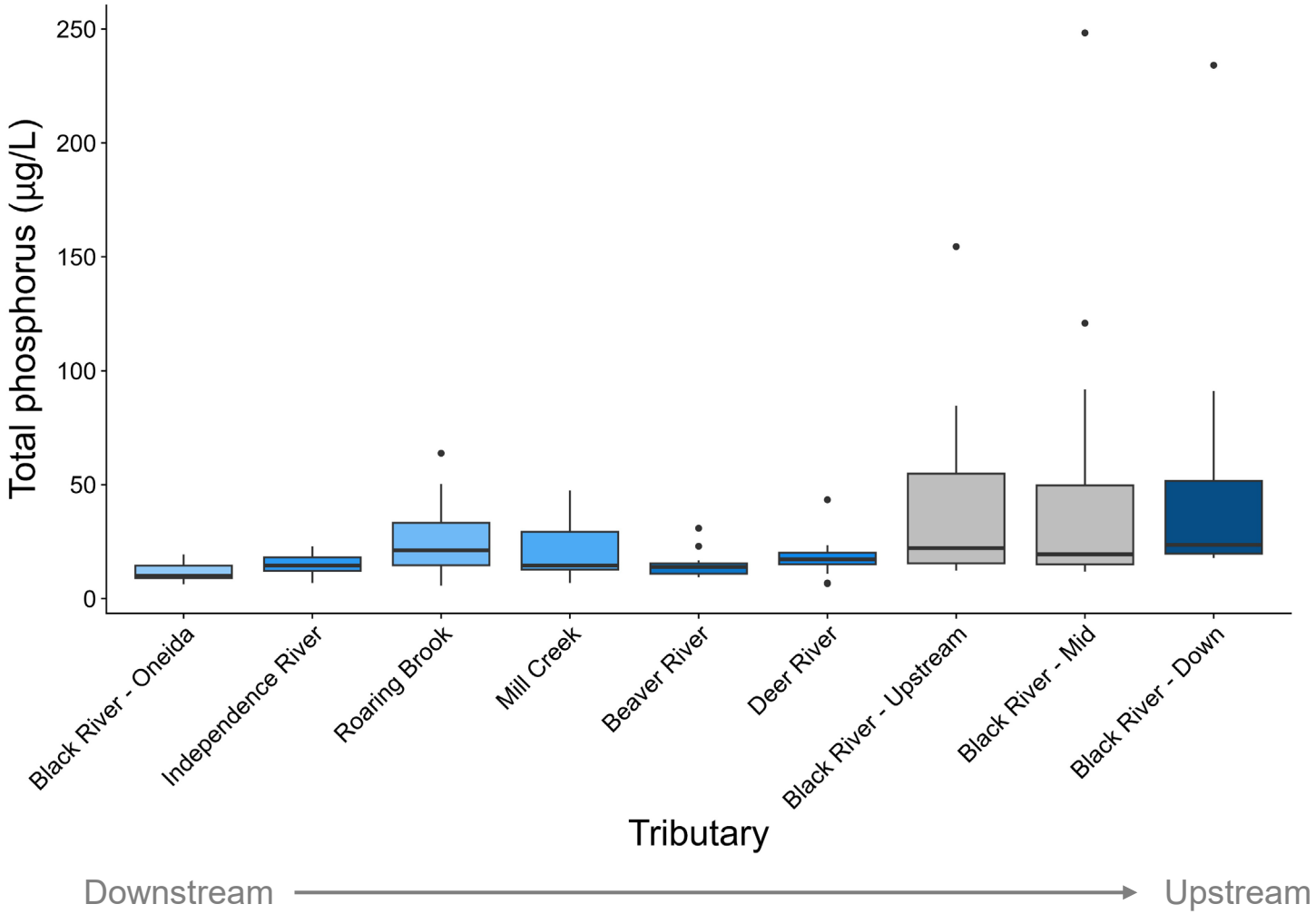
RESULTS

Total phosphorus (TP)



Mean TP concentrations similar among sites

Comparison to draft TP guidance values – flowing waters (NYSDEC)

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RESULTS

(1) Total suspended solids (TSS)

(2) Total nitrogen (TN)

(3) Total phosphorus (TP)

(4) Total dissolved phosphorus (TDP)

Portion of phosphorus that exists in dissolved form

Dissolved P bioavailable for primary production

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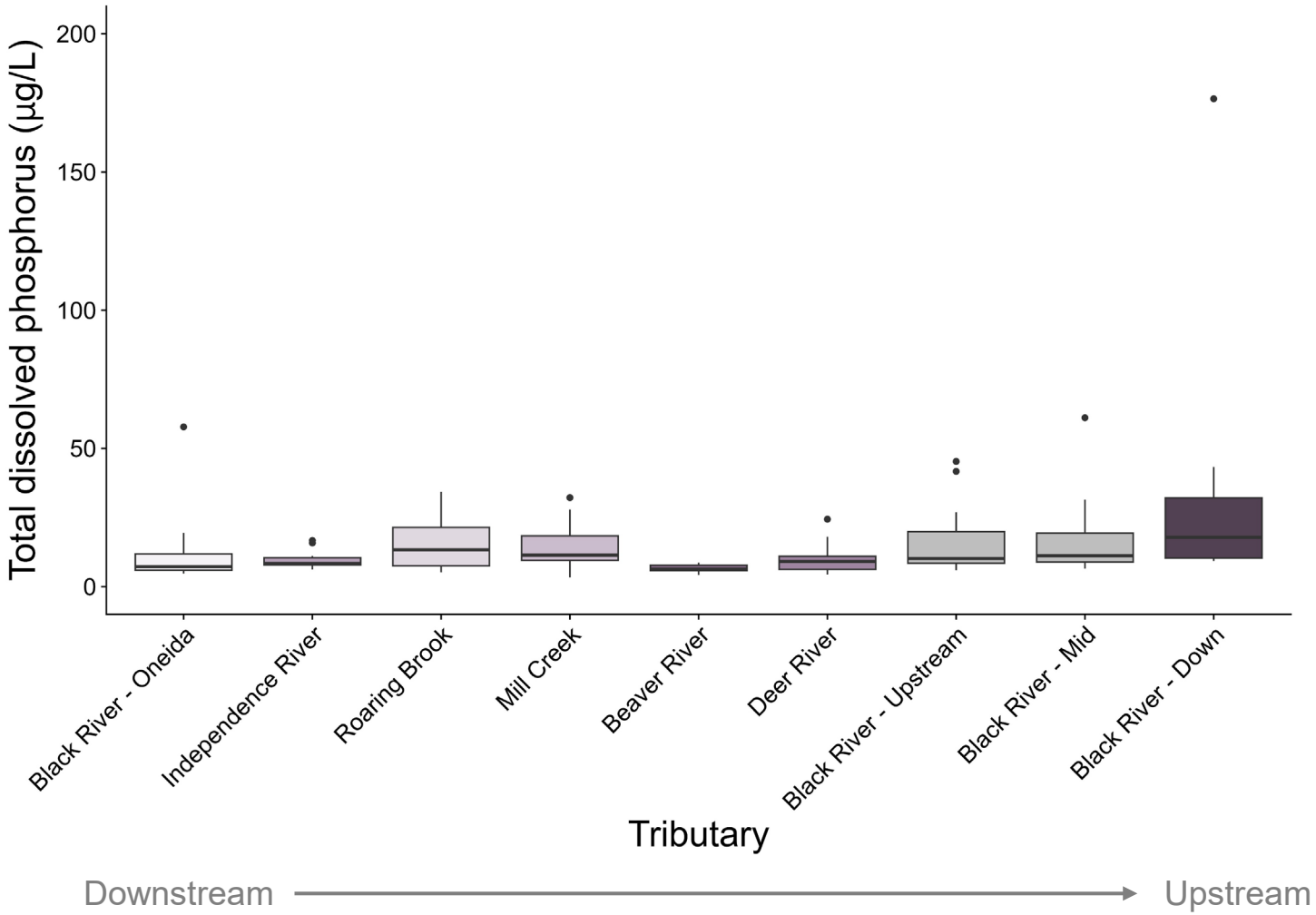
RESULTS

Total dissolved phosphorus (TDP)



Mean TDP concentrations similar among sites

TDP concentrations generally low

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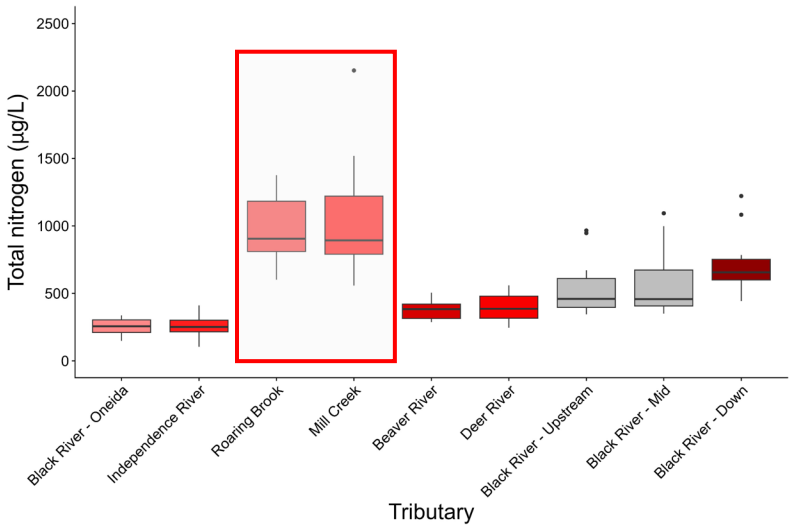
RESULTS

Overall, TSS and nutrient concentrations low

- Mean TP below draft NYSDEC flowing water guidance concentration
- Comparable water quality among sites

  TN at Roaring Brook and Mill Creek



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Recap

2024 tributary monitoring program:

(1) Generated water quality dataset –

- Addresses gaps spatially and by parameters (TSS, TN, TDP)
- Capacity for monitoring with SWCDs

Sample counts:

Site	Name	TSS (mg/L)	TN (µg/L)	TP (µg/L)	TDP (µg/L)
1	Black River (Oneida Co.)	15	15	15	14
2	Independence River	15	15	15	15
3	Roaring Brook	22	22	22	22
4	Mill Creek	15	15	15	15
5	Beaver River	15	15	15	15
6	Deer River	15	15	15	15
7	Black River – upstream	15	15	15	15
8	Black River – mid	17	17	17	17
9	Black River - downstream	17	17	17	17

n = **583**

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Looking ahead

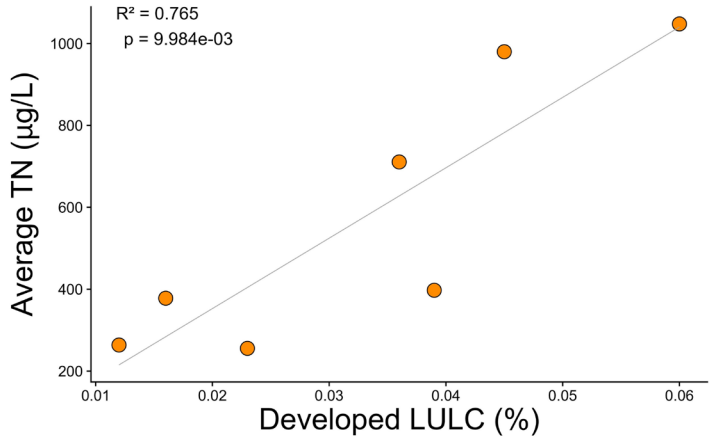
2024 tributary monitoring program:

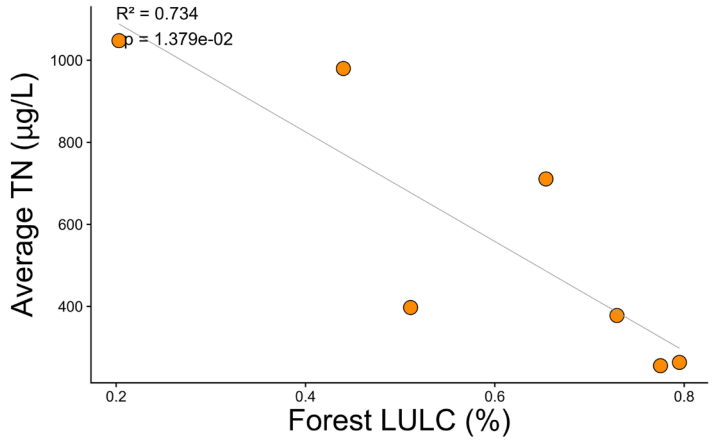
(2) Opportunities –

- Additional analyses (*among others*) –

  (a) Compare nutrient data to LULC
  (b) Estimate annual loads (*e.g.,* kg/ha/year)
  (c) Evaluate concentration-flow relationships

Build upon 2024 monitoring, future objectives





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Thank you!

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