



*Great Bend. Photo by Emily Fell*

# Black River Adaptive Modeling (BRAM) Phase I

Jasmine James, Ramboll

June 13, 2024

Black River Watershed Conference



Office of  
General Services

Department of  
Environmental  
Conservation



Bright ideas.  
Sustainable change.





# Planning Committee

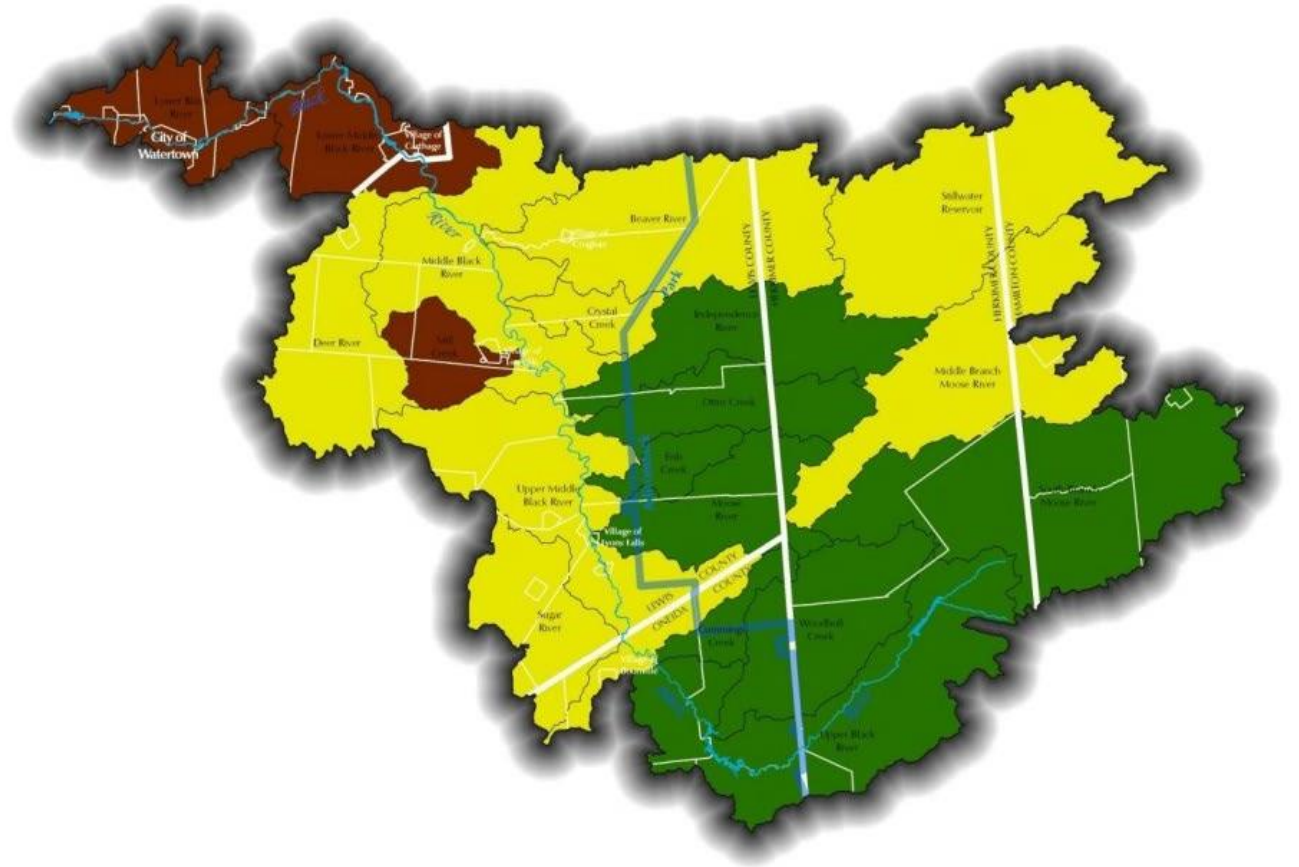
## Thank you to the following organizations:

- Tug Hill Commission
- Hamilton County Soil & Water Conservation District
- Herkimer County Soil & Water Conservation District
- Jefferson County Soil & Water Conservation District
- Lewis County Soil & Water Conservation District
- Oneida County Soil & Water Conservation District



# Goals of Black River Adaptive Modeling (BRAM)

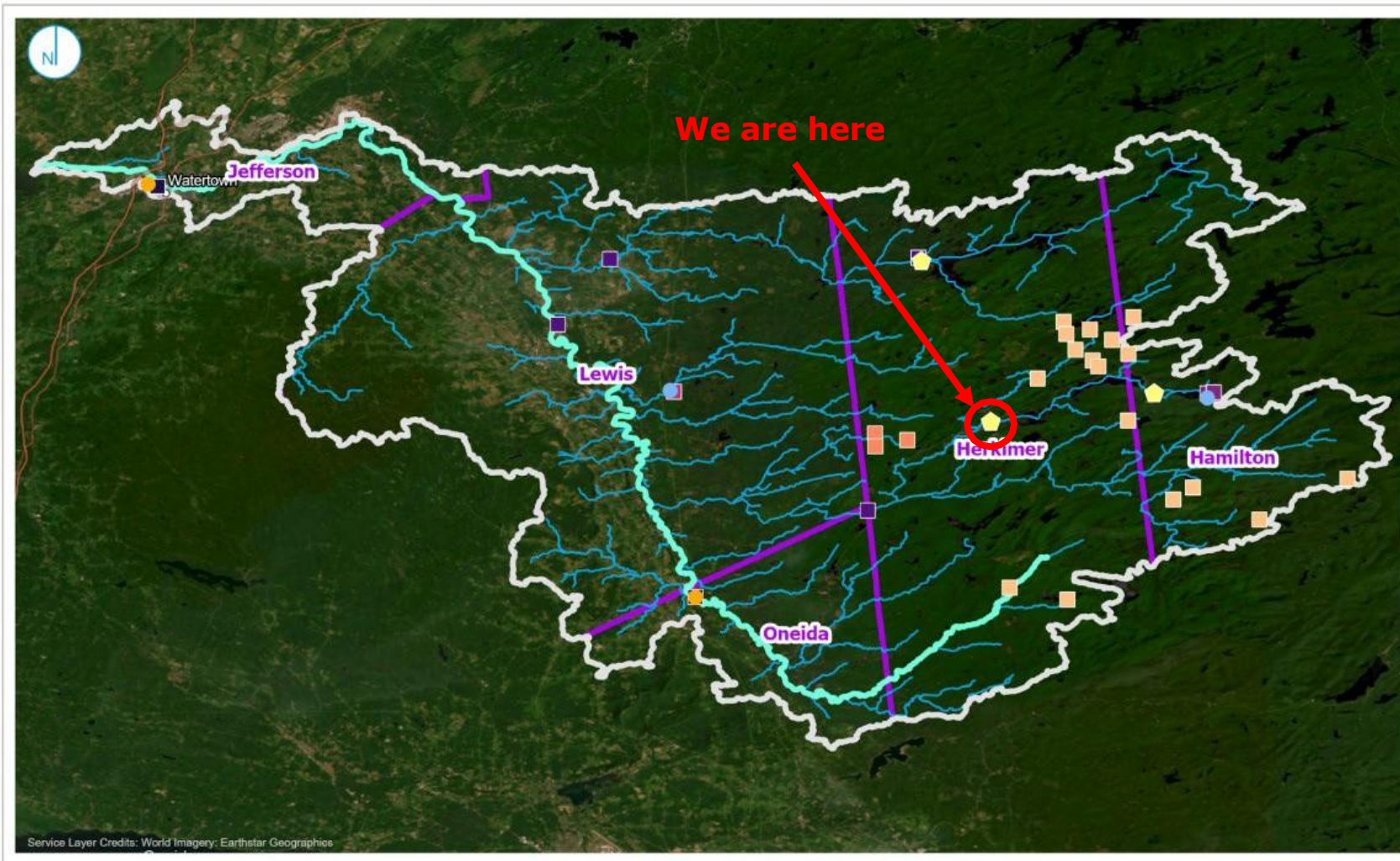
- Compile available datasets
- Receive input on new water quality concerns
- Identify spatial and quantitative data gaps
- Recommend additional water quality monitoring
- Identify new actions and projects to improve or protect water quality
- Track implementation of projects



*High (red), medium (yellow), and low (green) priority subwatersheds identified in the 2010 Black River Watershed Management Plan*



# Current Monitoring



## USGS Surface Water Sites

- Flow, TP, TN, TSS
- Flow, no desired WQ parameters present
- Flow and TN
- Flow and TP
- TP only
- No Flow, TP and TN present
- Lake-Surface Elevation

## NYSDEC RIBS Stream Monitoring Sites\*

- TN, TP are current
- no desired WQ parameters
- Black River Watershed Boundary
- Black River

*Note: Desired Parameters include Flow, TN, TP, TSS.*

*\* Only sites with data from 2020 or newer were selected.*

**BLACK RIVER ADAPTIVE MODELING  
CURRENT STREAM MONITORING LOCATIONS**

**FIGURE 4**

RAMBOLL US CONSULTING, INC.  
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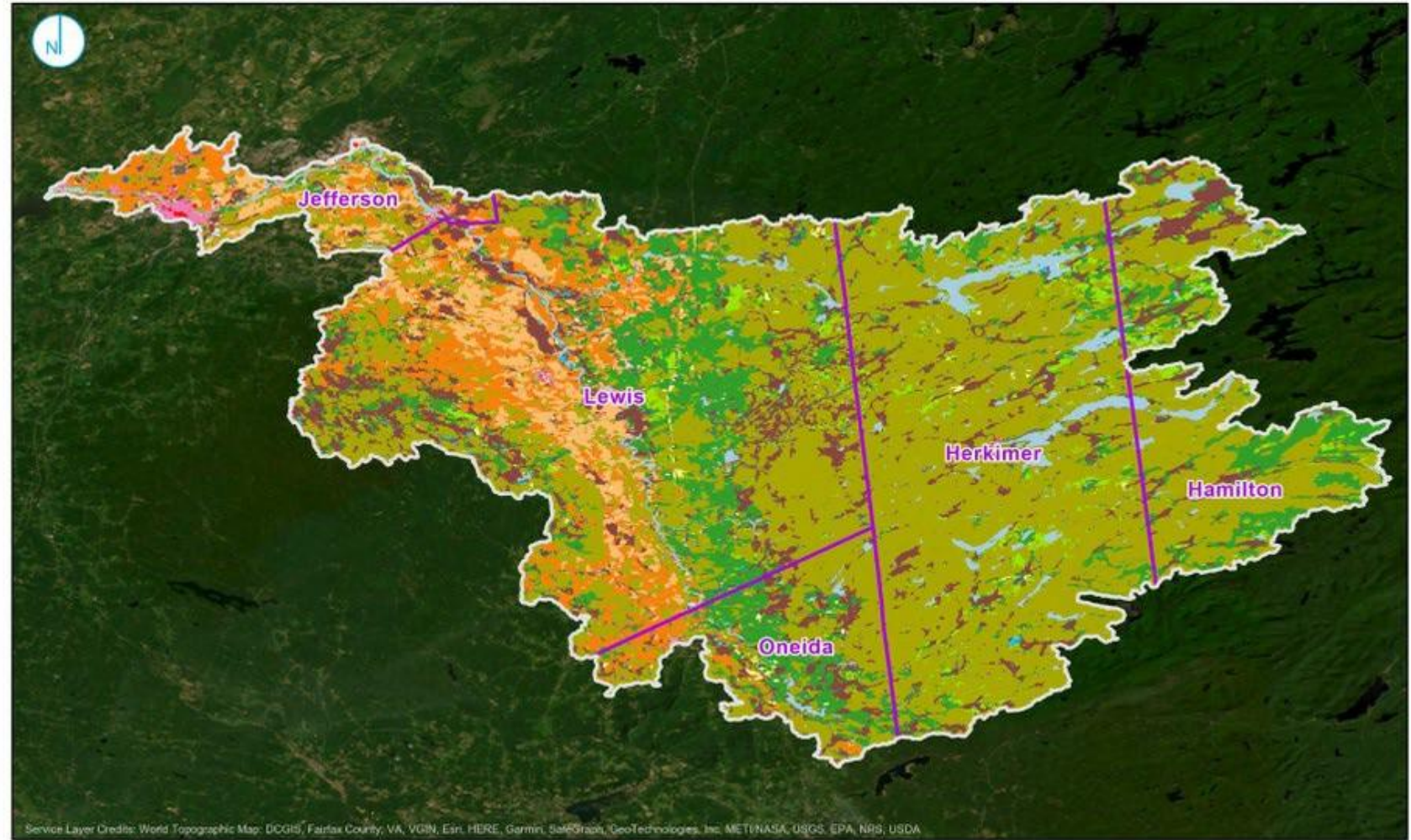
Black River Watershed  
North Central New York State





# Findings

- Black River watershed contains multiple unique land use areas that should be carefully monitored to accurately capture nutrient loading and water quality.



Service Layer Credits: World Topographic Map: DCGIS, Fairfax County, VA, VGIN, Esri, HERE, Garmin, Swatch, GeoTechnologies, Inc. METI/NASA, USGS, EPA, NRS, USDA



**BLACK RIVER LAND COVER TYPE NATIONAL LAND COVER DATABASE (NLCD) 2019**



Black River Watershed  
North Central New York State

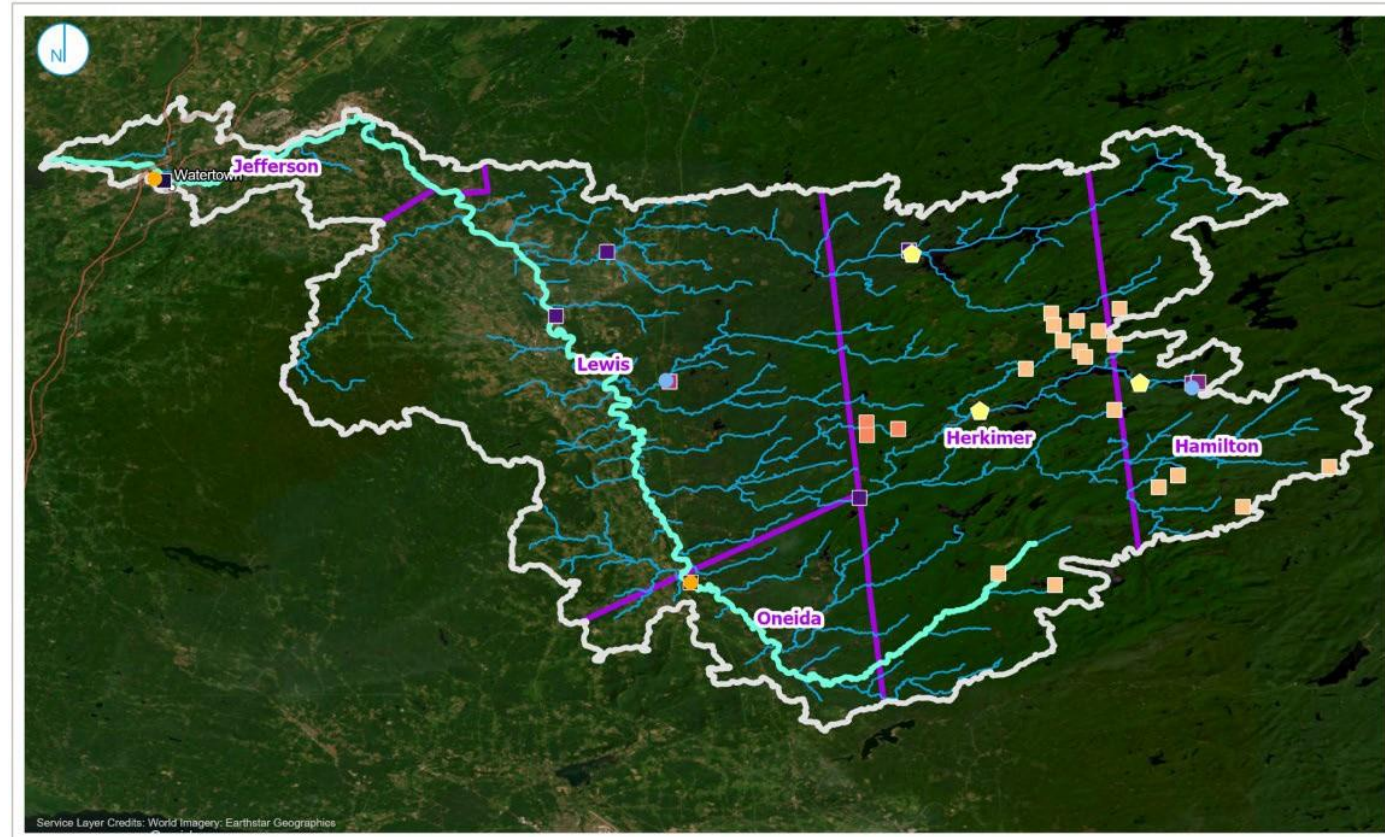
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# Findings

- Total suspended solids (TSS) and total nitrogen (TN) data are limited.
- Additional stream monitoring in Jefferson and Lewis Counties are recommended.



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## BLACK RIVER ADAPTIVE MODELING CURRENT STREAM MONITORING LOCATIONS



Black River Watershed  
North Central New York State

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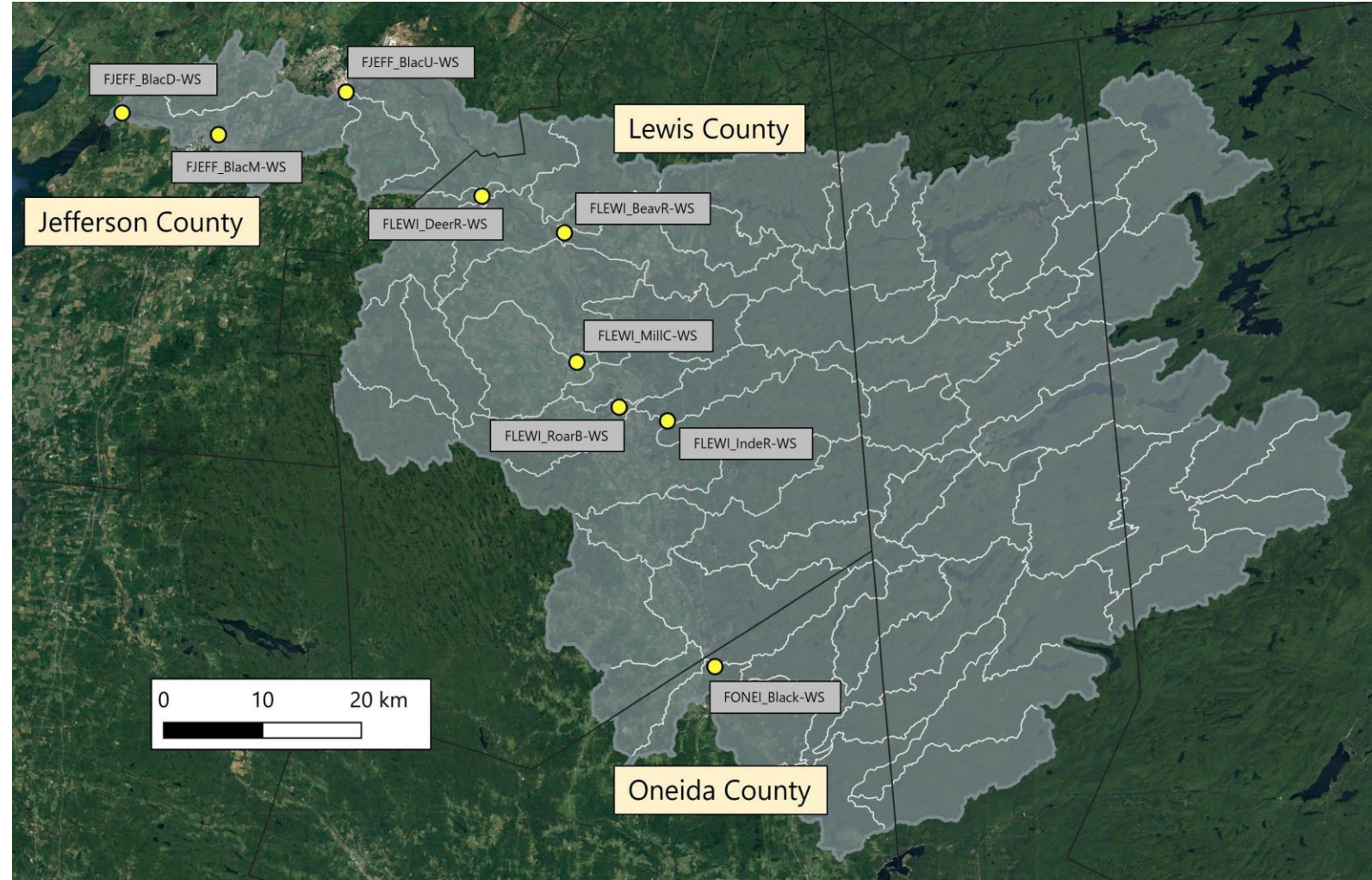
**RAMBOLL**



# Recommendation: Water Quality Monitoring

## 2024 Monitoring

- Bi-monthly sampling, May through November (including right after storm events).
- 9 sites – Oneida, Lewis, and Jefferson Counties
  - 4 Black River
  - 1 Deer River
  - 1 Beaver River
  - 1 Mill Creek
  - 1 Roaring Brook
  - 1 Independence River
- Flows already recorded from USGS gages





# Implementation

- Based on Phase I findings, the planning committee began water quality monitoring at the nine recommended locations.
- With remaining BRAM Phase I funding, Upstate Freshwater Institute (UFI) assisted SWCDs with developing a monitoring QAPP and held two water quality monitoring trainings.
- SWCDs collaborated to fund laboratory analyses, share equipment, and continue coordination with UFI.



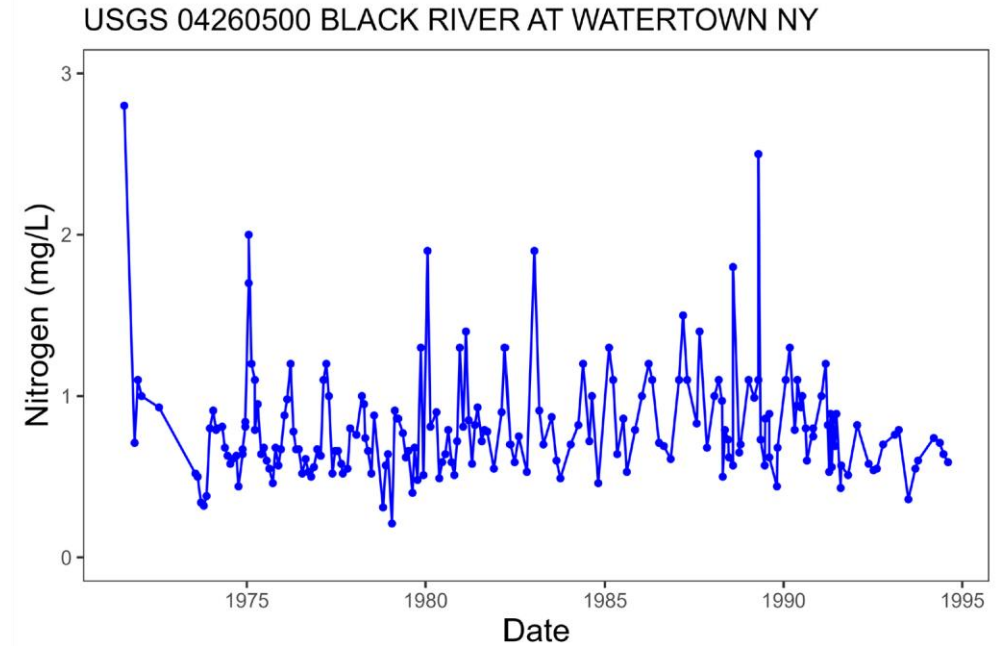
*Water quality monitoring training. Photo by Emily Fell*



# Water Quality Monitoring

## Importance:

- Identify sources of nutrients and help prioritize projects
- Ability to track change(s) over time – trends, timely interventions
- Support regulatory compliance – *e.g.*, NYSDEC 303d listing
- Raises public awareness
- Support future research – climate change (i.e., more intense storms), land-use patterns, etc.





# December 2023 Storm



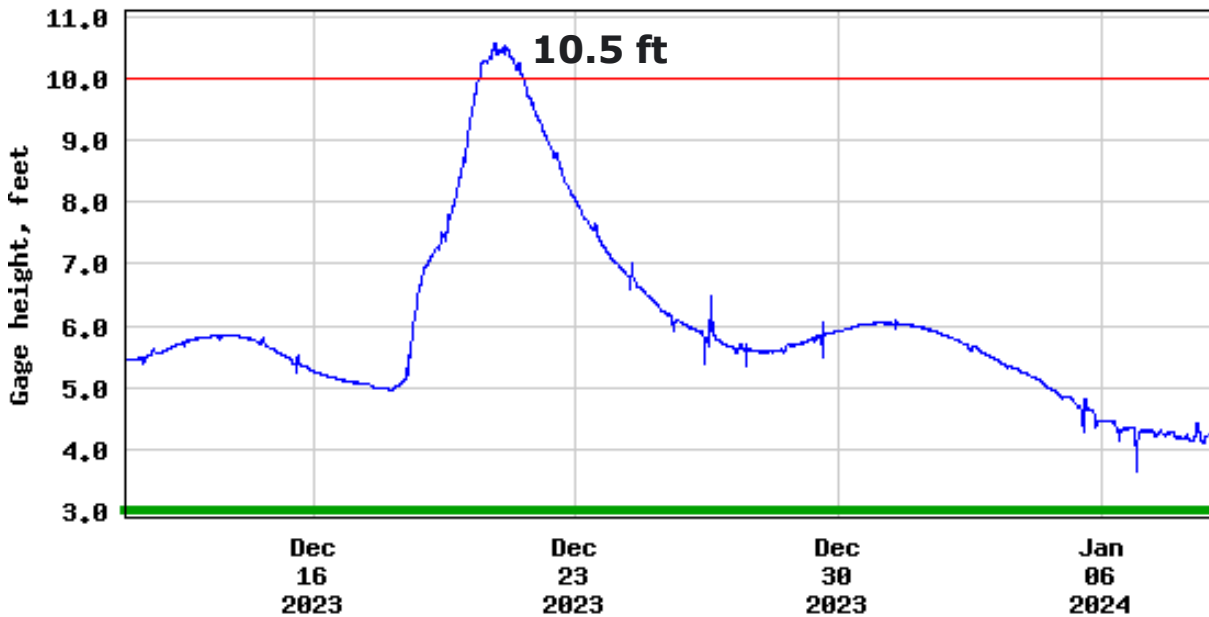
Station: WATERTOWN INTERNATIONAL AIRPORT, NY US USW00094790

Year	Month	Day	Temperature (F)			Rain, Melted Snow, Etc. (in)
			"24 Hrs. Ending at Observation Time"		At Obs.	
			Max.	Min.		
2023	12	01	49	40		0.41
2023	12	02	41	36		0.07
2023	12	03	45	35		0.77
2023	12	04	42	31		0.02
2023	12	05	33	30		T
2023	12	06	30	17		T
2023	12	07	34	16		0.07
2023	12	08	47	27		0.01
2023	12	09	56	44		T
2023	12	10	56	39		0.32
2023	12	11	39	31		0.05
2023	12	12	44	32		0.04
2023	12	13	37	23		T
2023	12	14	43	17		0.00
2023	12	15	48	43		0.00
2023	12	16	48	31		0.00
2023	12	17	54	45		0.16
2023	12	18	52	39		1.37
2023	12	19	39	17		0.07
2023	12	20	37	19		0.00
2023	12	21	32	15		0.00
2023	12	22	33	14		0.00
2023	12	23	37	23		0.15
2023	12	24	39	34		0.03
2023	12	25	54	30		0.00
2023	12	26	53	29		0.04
2023	12	27	50	46		0.50
2023	12	28	49	39		0.25
2023	12	29	43	36		0.39
2023	12	30	36	28		0.02
2023	12	31	29	25		T
Summary			43	30		4.74



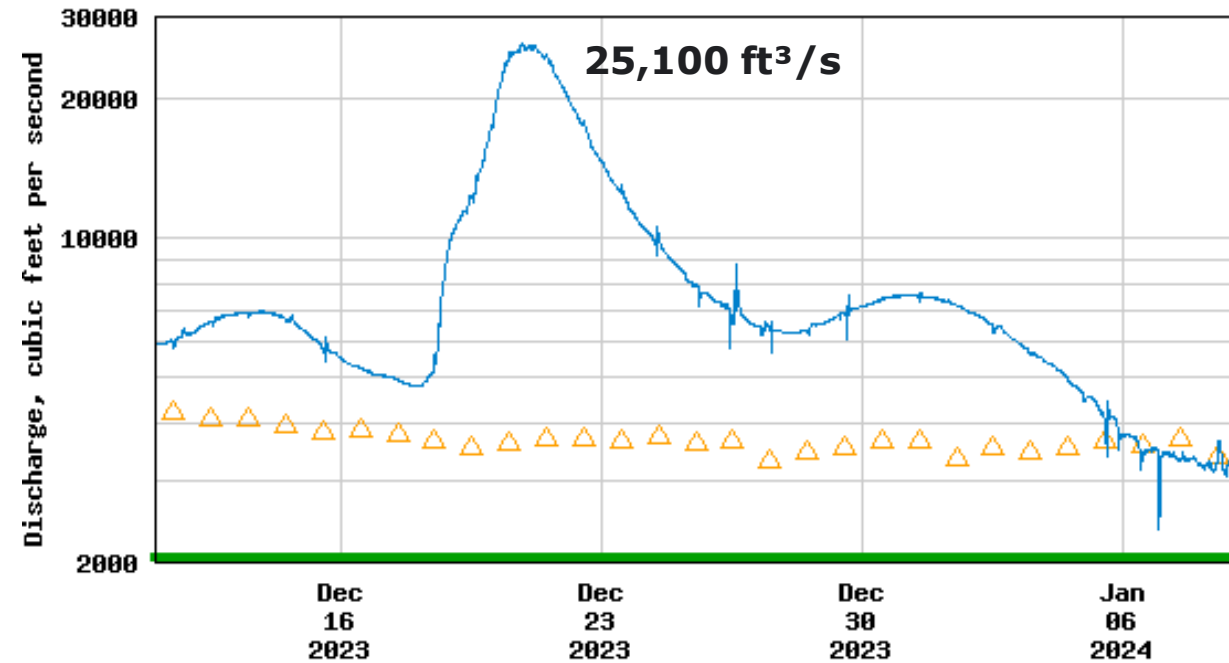
# December 2023 Storm

USGS 04260500 BLACK RIVER AT WATERTOWN NY



- Gage height
- Period of approved data
- National Weather Service Flood Stage

USGS 04260500 BLACK RIVER AT WATERTOWN NY



- △ Median daily statistic (104 years)
- Period of approved data
- Discharge



# Water Quality Monitoring

## 2024 Monitoring

- Parameters measured with YSI sonde:
  - Temperature ( $^{\circ}\text{C}$ )
  - Specific conductance ( $\mu\text{S}/\text{cm}$ )
  - pH
  - Turbidity (NTU)
  - Dissolved oxygen ( $\text{mg}/\text{L}$ ; % sat)



*YSI sonde.*

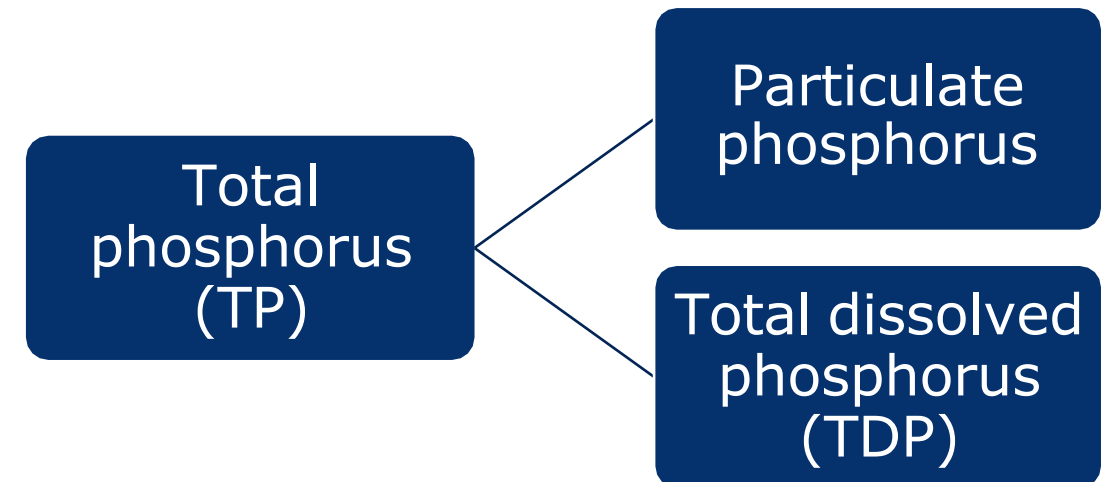


*Water quality monitoring training.*

# Water Quality Monitoring

## 2024 Monitoring

- Parameters measured in laboratory:
  - Total phosphorus (TP)
  - Total nitrogen (TN)
  - Total dissolved phosphorus (TDP)
  - Total suspended solids (TSS)





# Water Quality Monitoring

## 2024 Monitoring

- Bimonthly sampling is ongoing through November under a quality assurance project plan (QAPP).
- Samples being analyzed at UFI (Syracuse, NY).
- Data usability assessment report (DUAR) submitted annually to reflect on results and any deviations from the QAPP.



*Downstream of Hawkinsville Dam.  
Photo by Tony Eallonardo*

# Next Steps



1. Formalize District Watershed Organization (BRWC) & establish administrative framework
2. Evaluate existing recommendations provided by BRAM, DEC, and 9E Plan
3. Evaluate watershed needs based on water quality data from UFI
4. Establish an implementation plan
5. Establish feasibility of Phase II
6. Seek funding sources





**Thank you!**

