



SANDY CREEKS

# 9 ELEMENT

# WATERSHED PLAN

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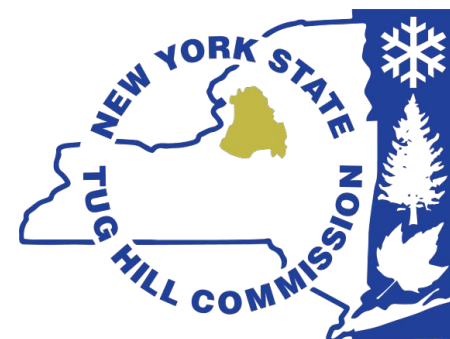
Water Testing Results and Next Steps



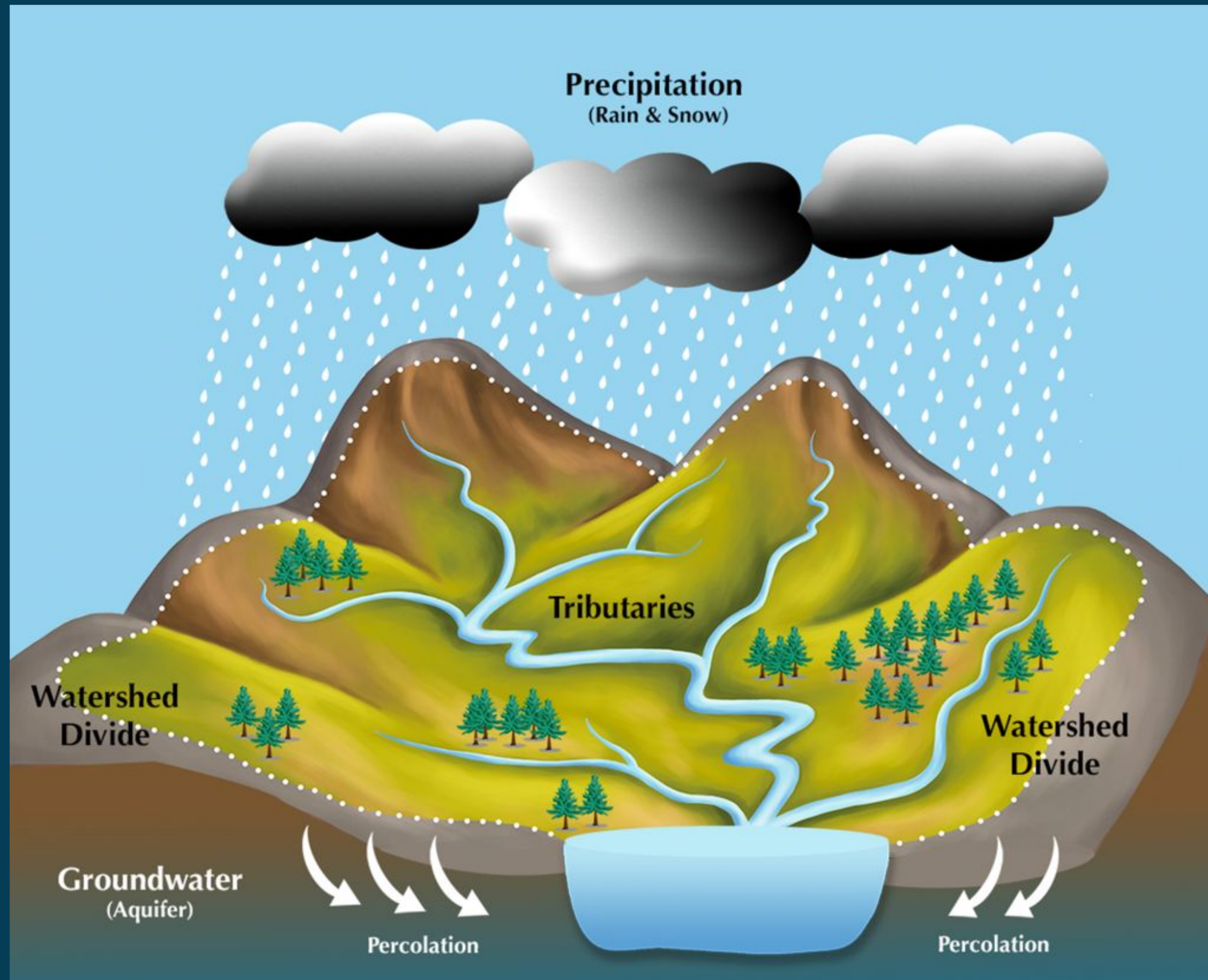
*Jefferson County*  
Soil & Water  
Conservation District



Lewis  
County  
SWCD

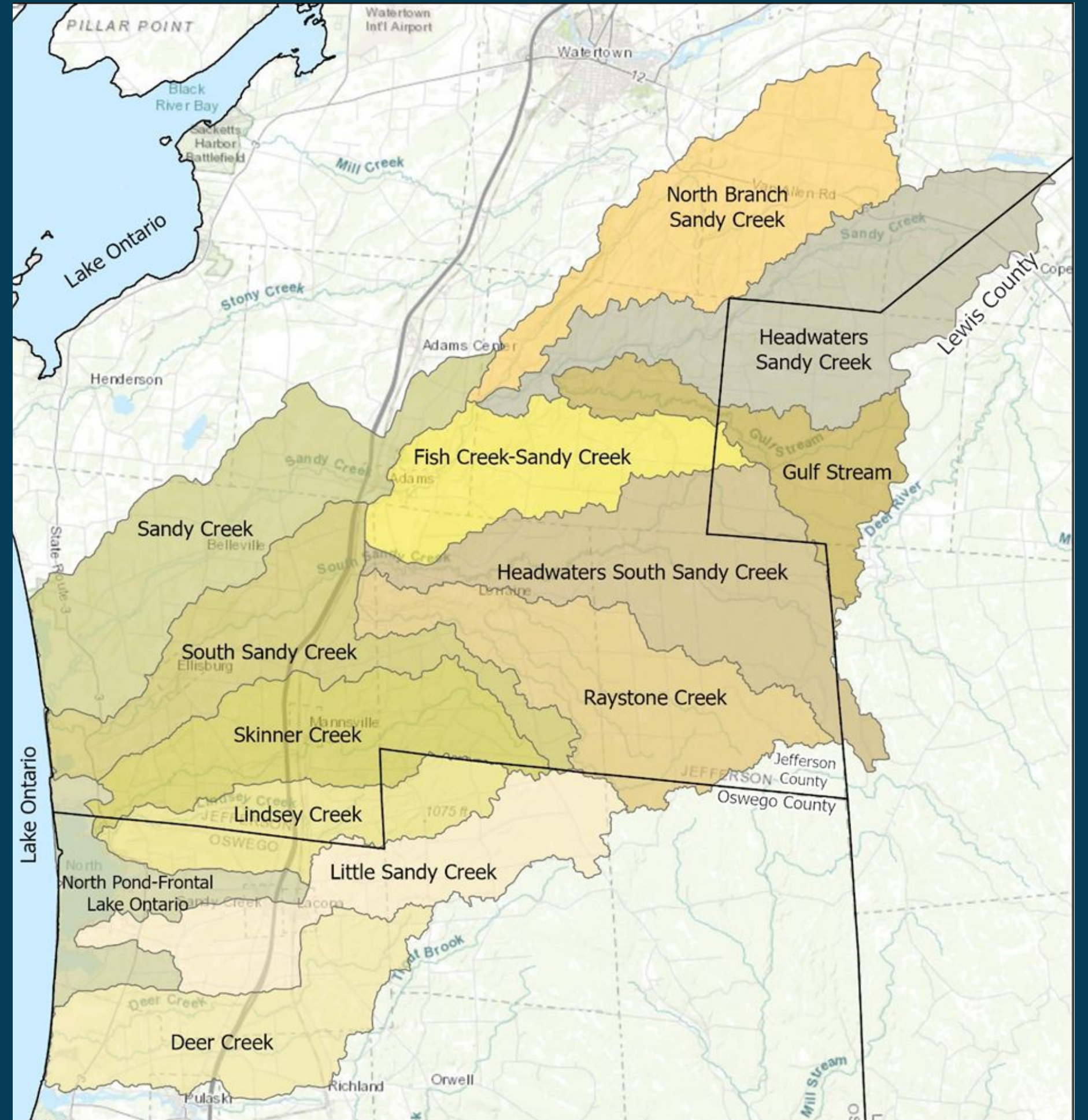


Department of  
Environmental  
Conservation



Source: Seacoast Science Center



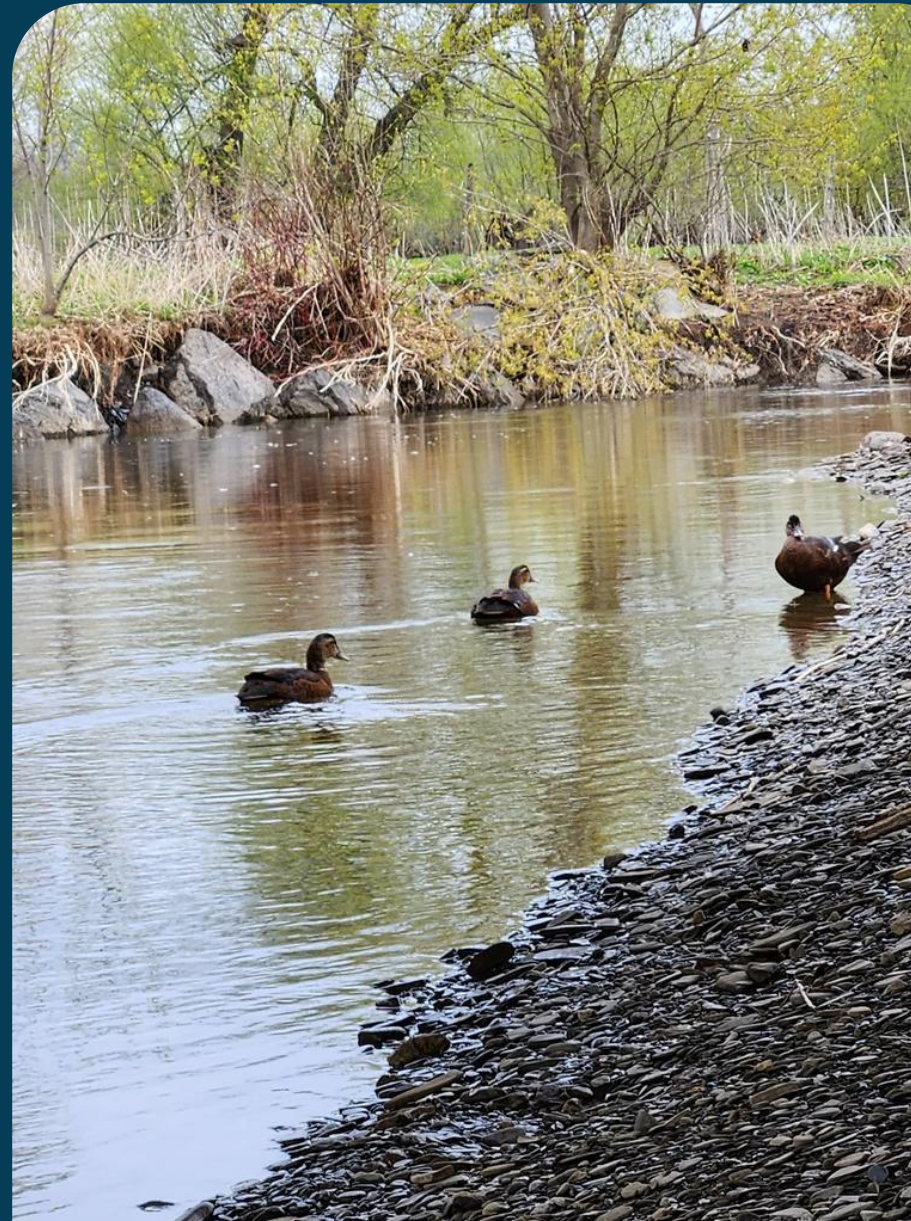




# 9 KEY ELEMENTS OF A 9E PLAN

- A. Identify & quantify pollution sources in the watershed
- B. Establish pollutant load reduction targets to reach WQ goal(s)
- C. Identify BMPs to reduce pollutants, considering landowner interests, and estimate load reduction and BMPs needed to achieve WQ goal(s)
- D. Identify grant funding to implement BMPs identified in C
- E. Build relationships with local stakeholders and integrate stakeholder input into the plan to facilitate plan implementation
- F. Develop a BMP implementation schedule based on stakeholder input
- G. Plan to evaluate progress on BMP implementation
- H. Establish criteria to assess water quality improvement from BMP implementation
- I. Develop and implement a monitoring plan to collect WQ data and measure success







# Proposed Vision Statement

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The goal of the Sandy Creeks 9E is to maintain existing water quality and ecosystem functions in the tributaries and improve the near-shore water quality, ecosystem functions, and resiliency of Eastern Lake Ontario, including nearshore embayments, while preserving the values of local communities, including recreation and fishing.



# Your Vision Statement Feedback

*Better water quality management*

*Public water and sewer available in all densely populated areas especially near streams, lakes and S*

*Be a positive contribution to the water quality in Sandy Pond*

**Preservation**

*remain clean of pesticides and farm runoffs that feed HAB and safe for all, including pets*

**Less weeds in Sandy Pond**

*Proper functioning ecosystems*

*Clean, healthy ecosystem that supports regional biodiversity*

*Healthy Clean Environment*

**climate resilience**

*enforce regulations and monitor potential polluters for compliance.*

**improved, consistent water levels**

*Keep the status quo or improve the conditions of the watershed*

*Reduce water quality threats from bacterial and nutrient loads from septic systems and agriculture*

**Improve recreational viability**

*Monitor and maintain nitrate, ecoli, and other pollutants at or below EPA standards*

*Clean water to support the fishing, fish spawning habitat and water recreation activities*

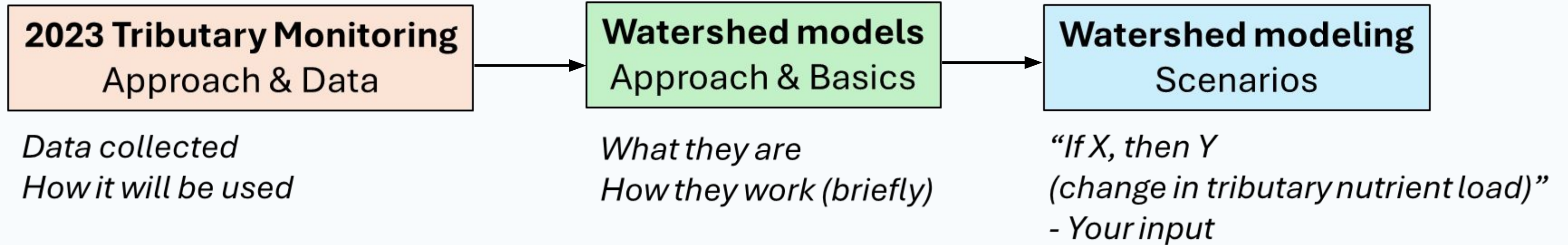
*Mitigate water quality issues affecting sandy pond and tribs*

*Minimize algae blooms -reduce nutrients*

*Clean and environmentally friendly*

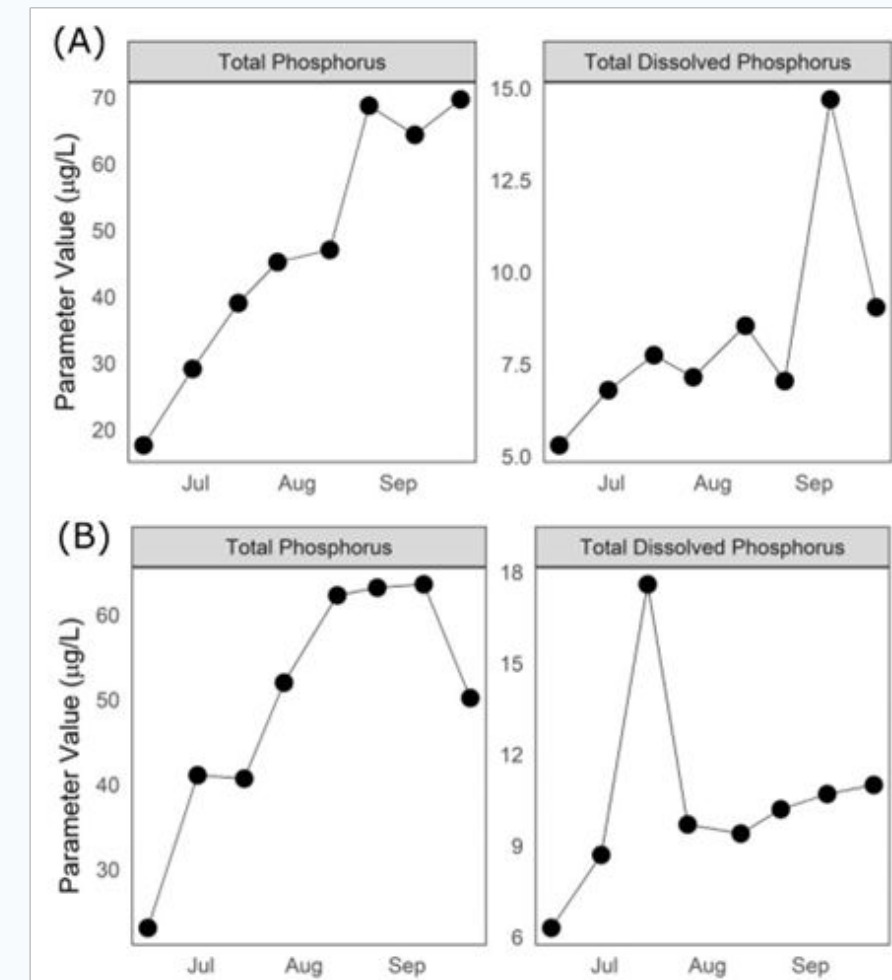


# Overview



## What are we trying to learn and understand?

- (1)** How does total phosphorus (TP) loading from tributaries vary in the project area?
- (2)** How does TP load from tributaries (watershed) contribute to nearshore water quality (e.g., Sandy Pond)?
- (3)** Management activities that could be implemented to achieve goals





# Tributary Monitoring 2023

- 17 sampling events
- March – December 2023

## Laboratory:

Total suspended solids (TSS)

Total nitrogen (TN)

Nitrate+Nitrite (NO<sub>x</sub>)

Ammonia (NH<sub>3</sub>)

**Total phosphorus (TP)** → *Model focus*

Total dissolved P (TDP)

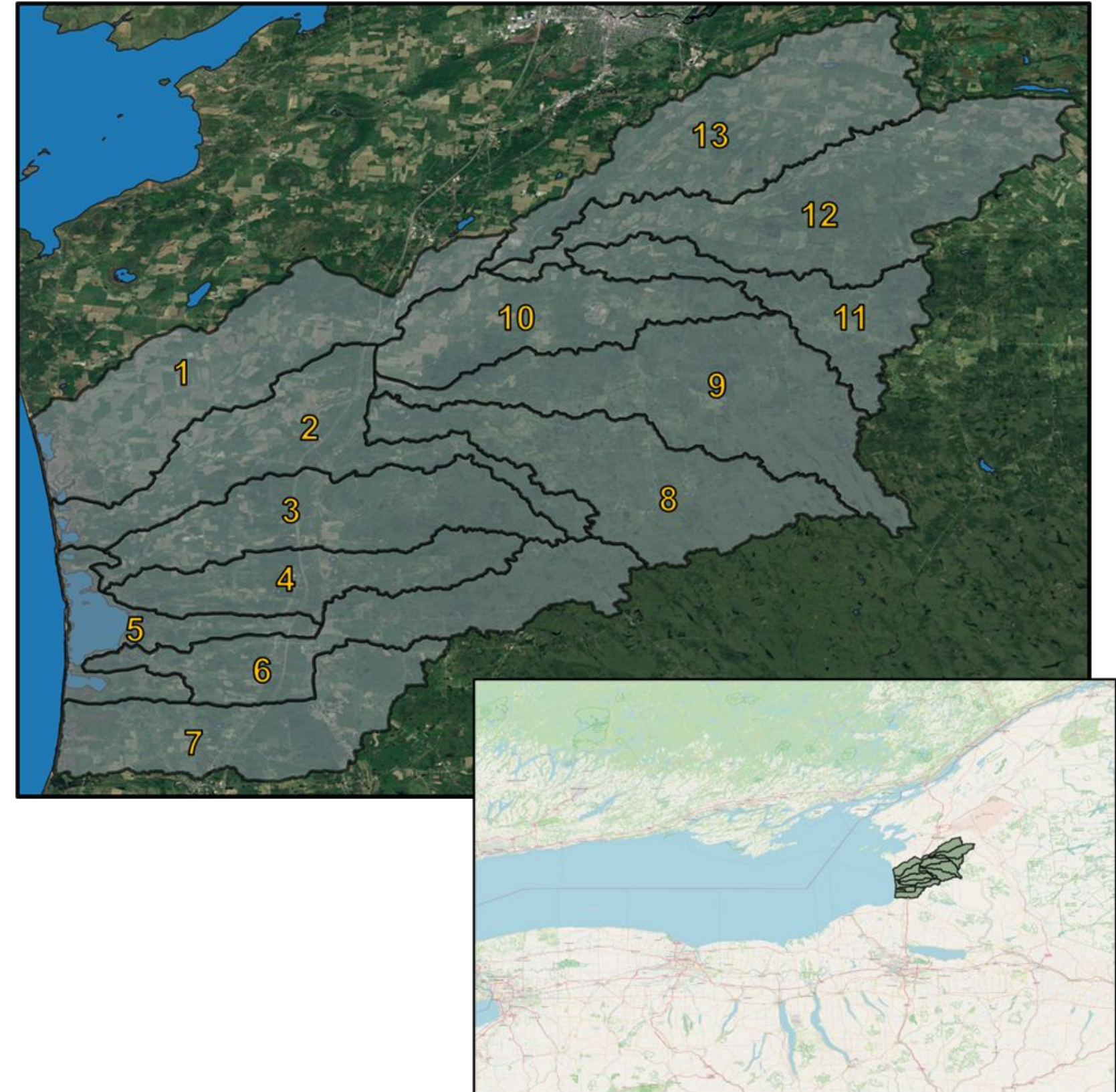
Soluble reactive P (SRP)

Fecal coliform

## Field:

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

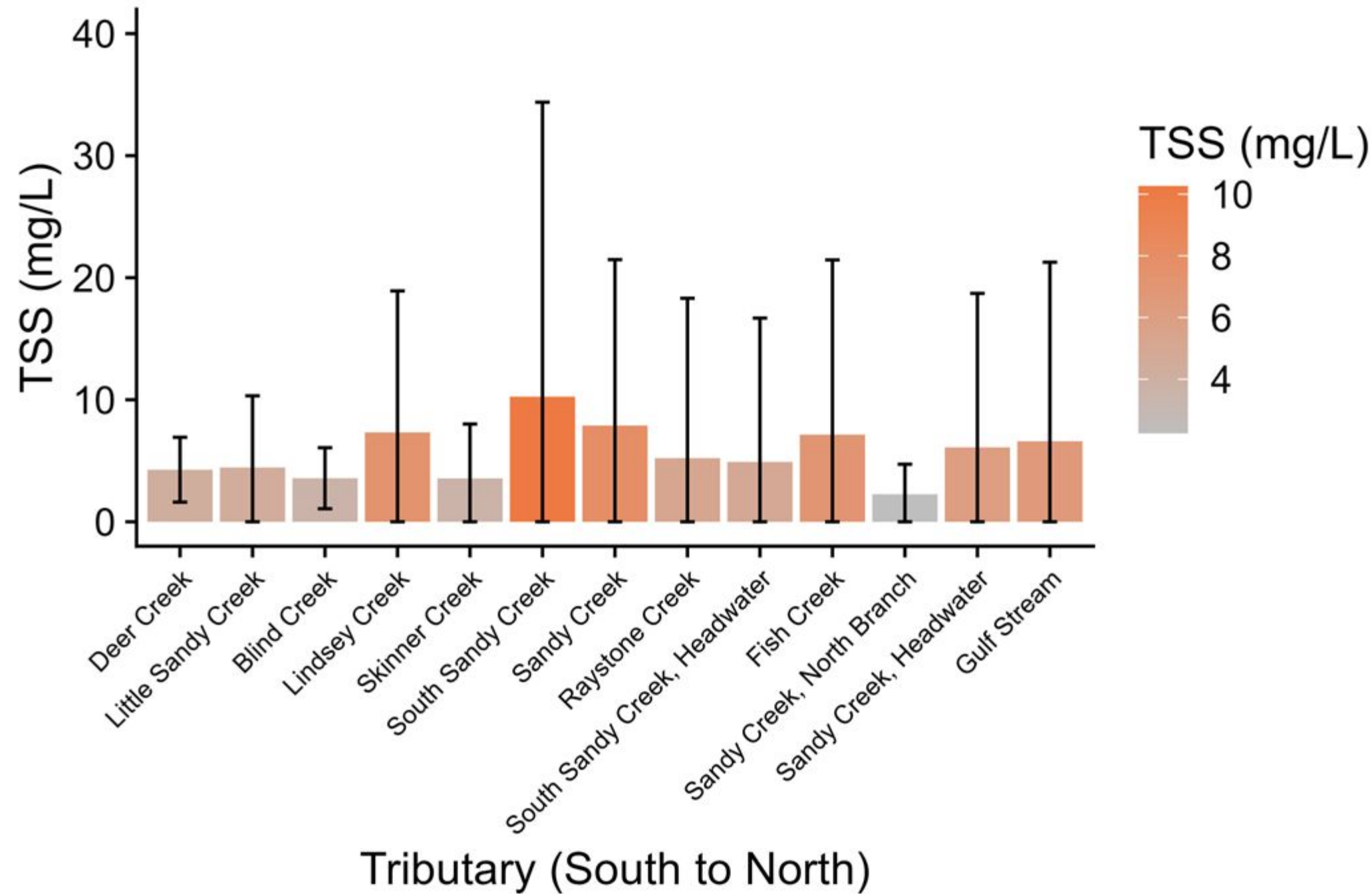
Field estimated flow (ft<sup>3</sup>/sec.)



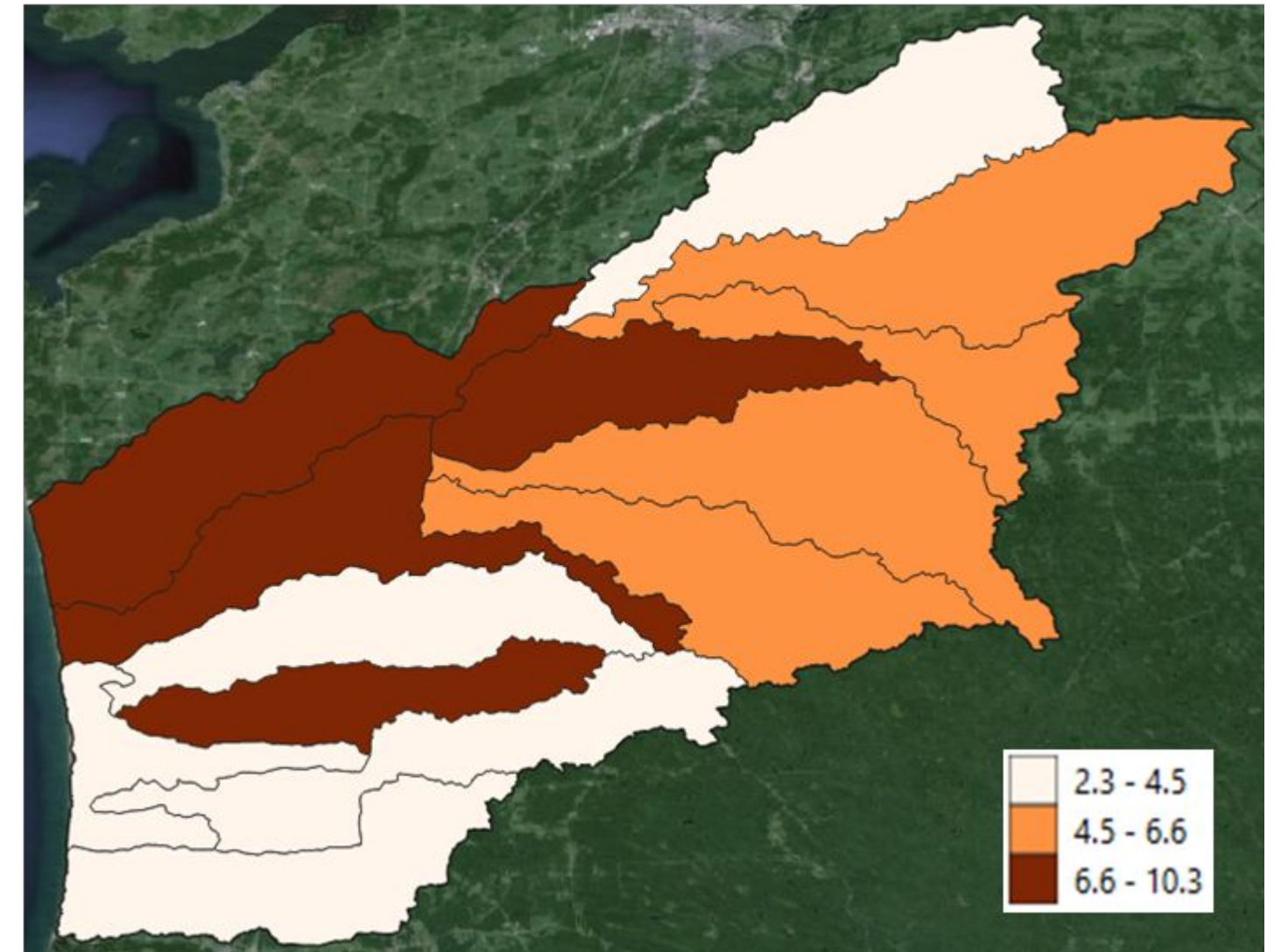


# Tributary Monitoring 2023

**Total suspended solids (mg/L)**  
*mass per volume of solids present in water*



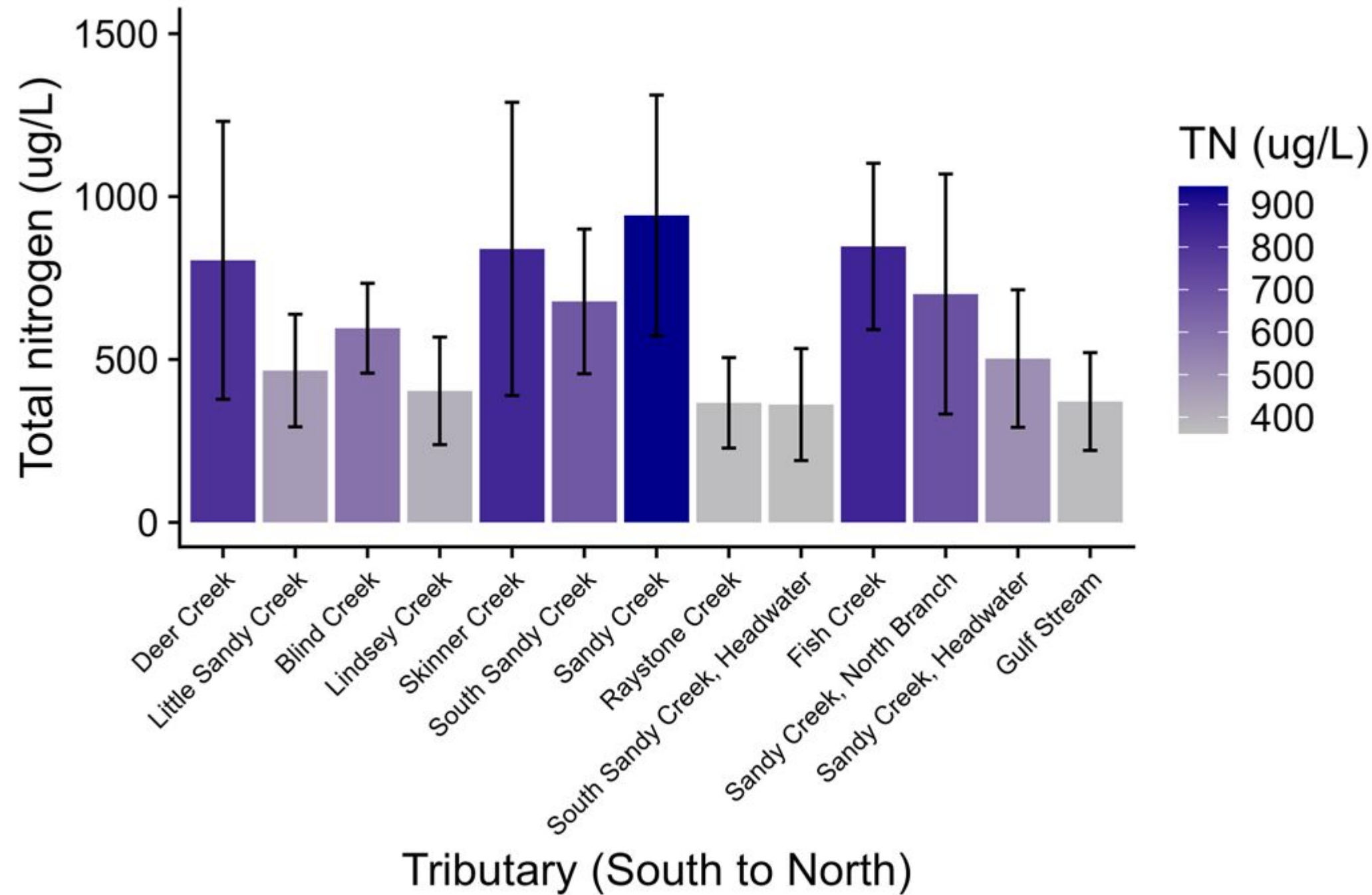
**Average TSS (mg/L) – March through December 2023**



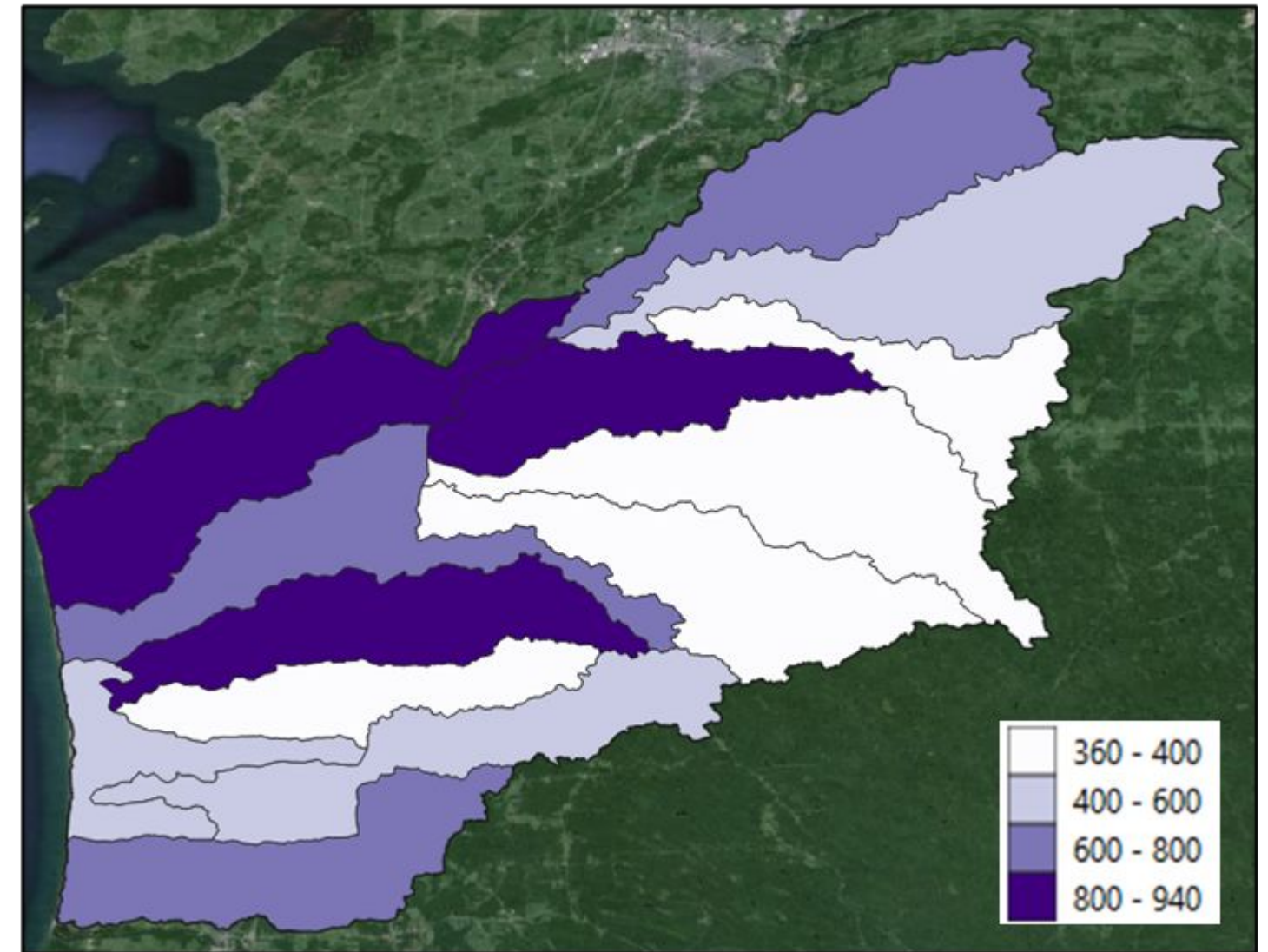


# Tributary Monitoring 2023

## Total nitrogen (TN)



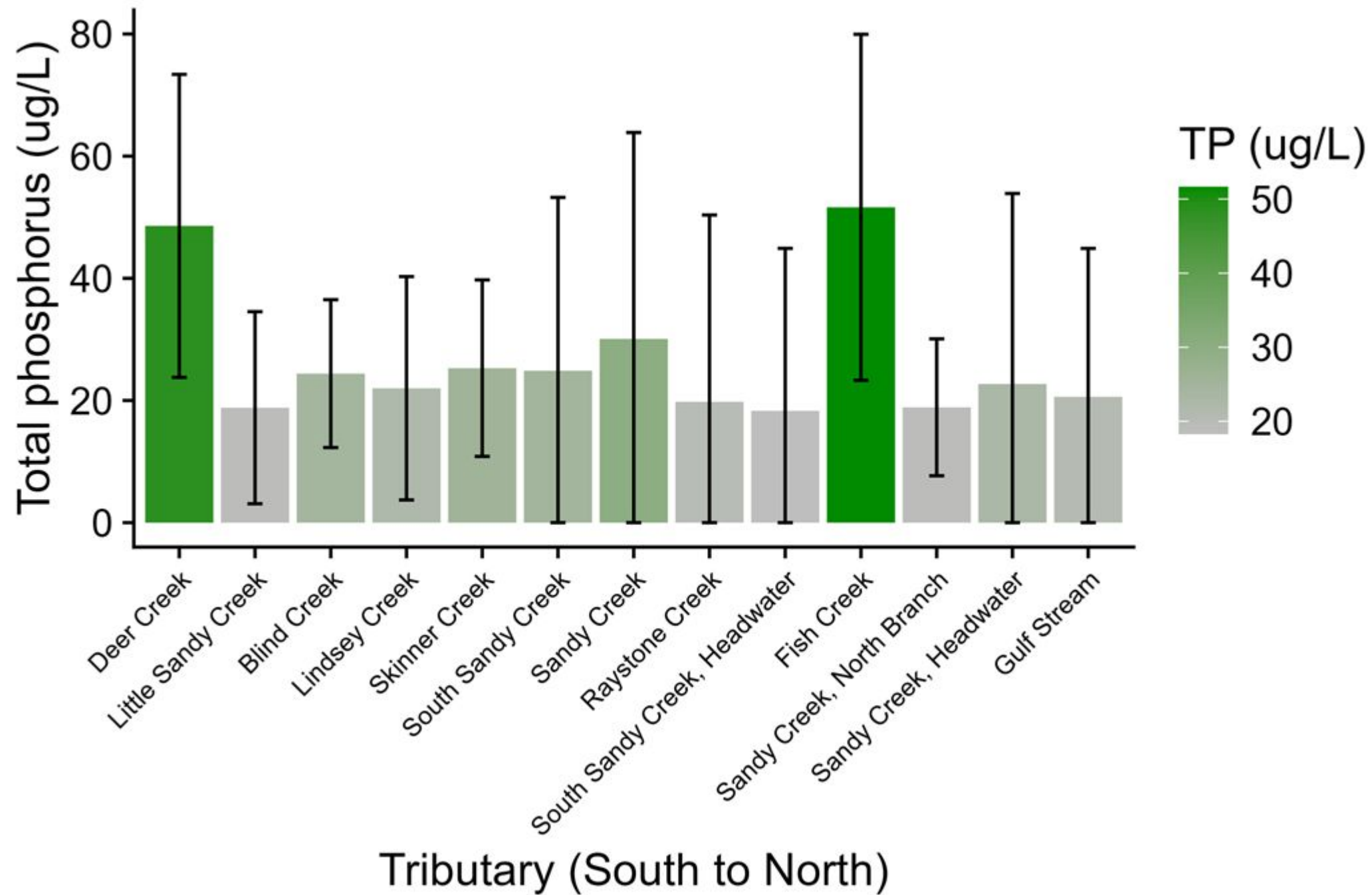
*Average TN ( $\mu\text{g/L}$ ) – March through December 2023*



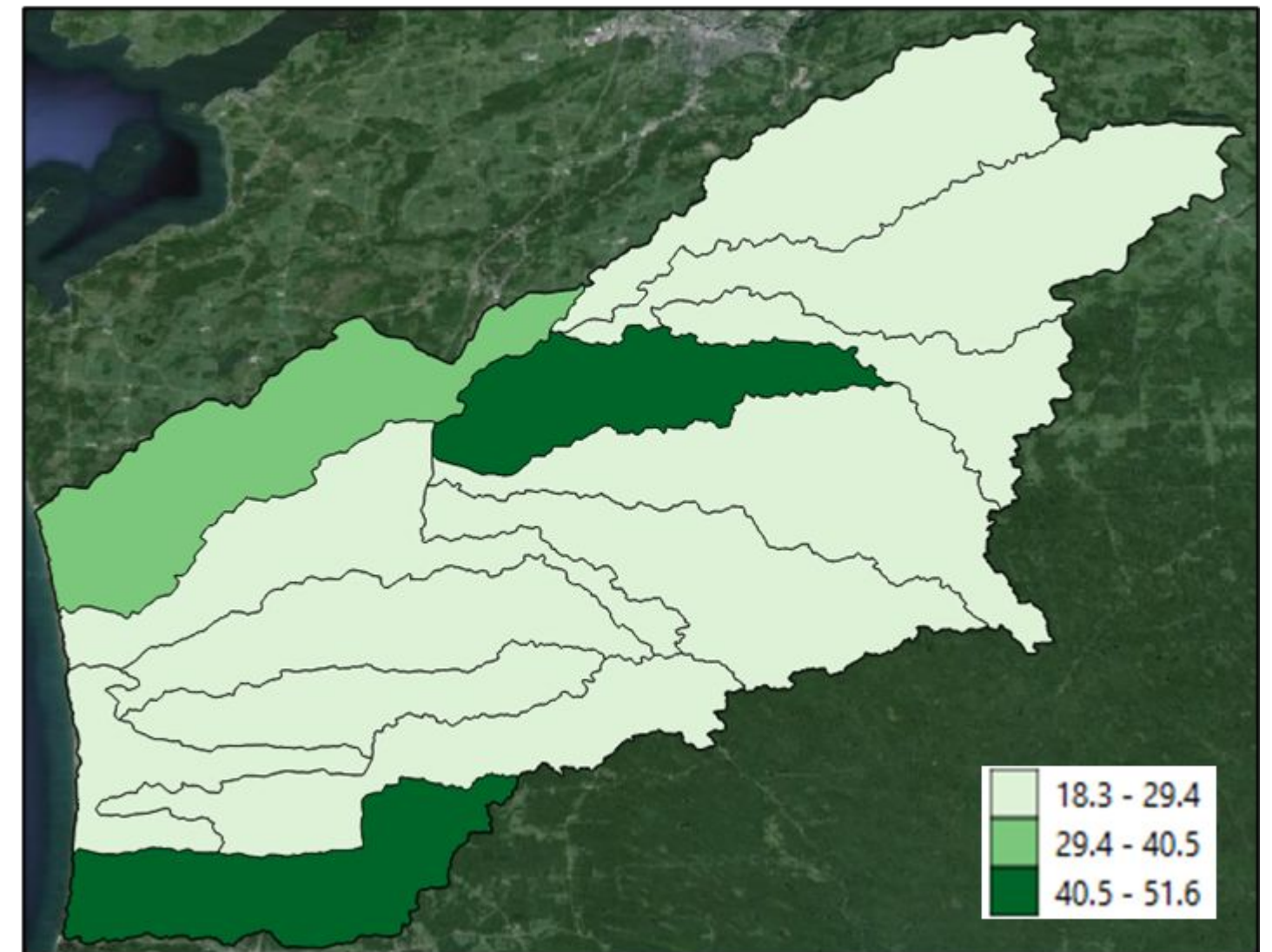


# Tributary Monitoring 2023

## Total phosphorus (TP)



Average TP ( $\mu\text{g/L}$ ) – March through December 2023

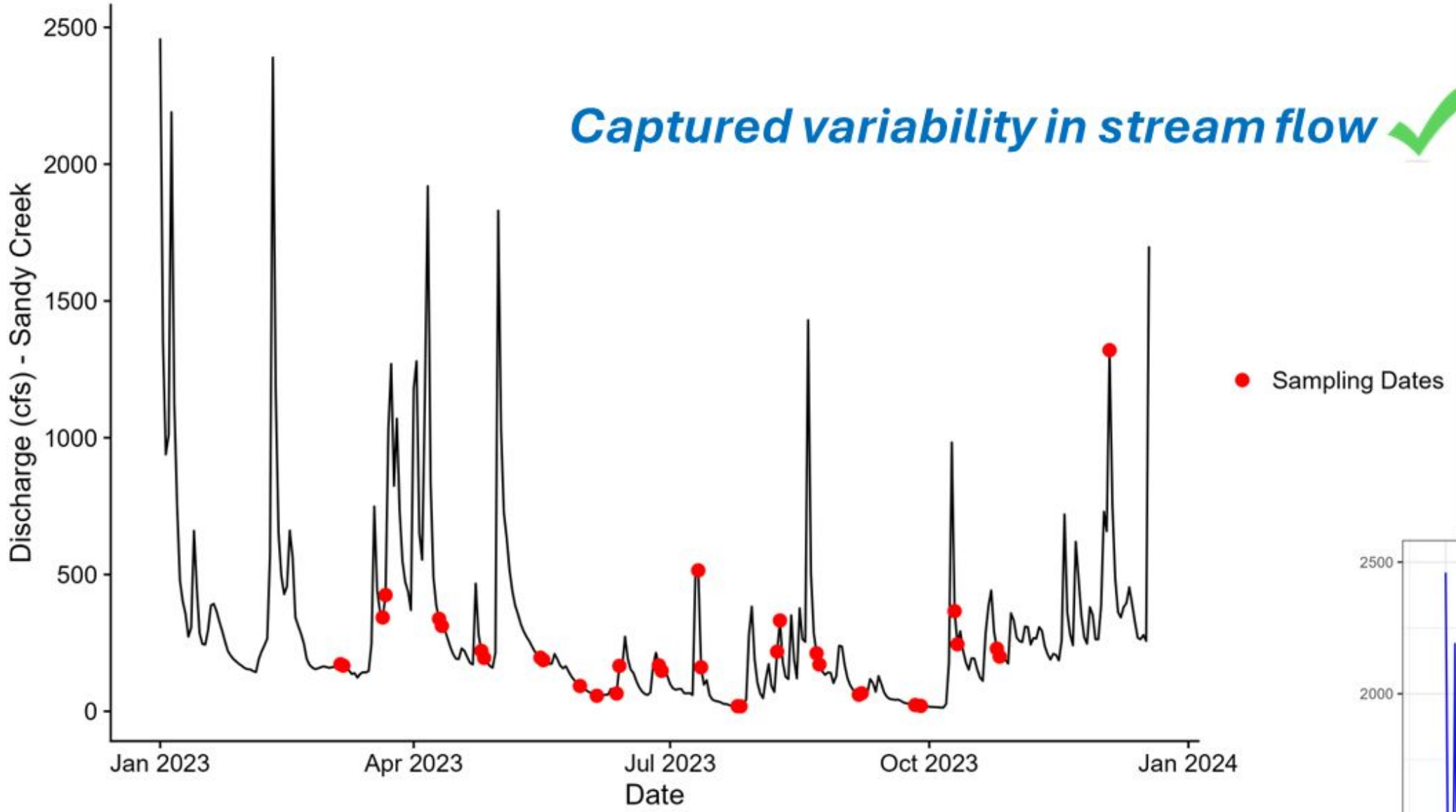


**Questions / Discussion**

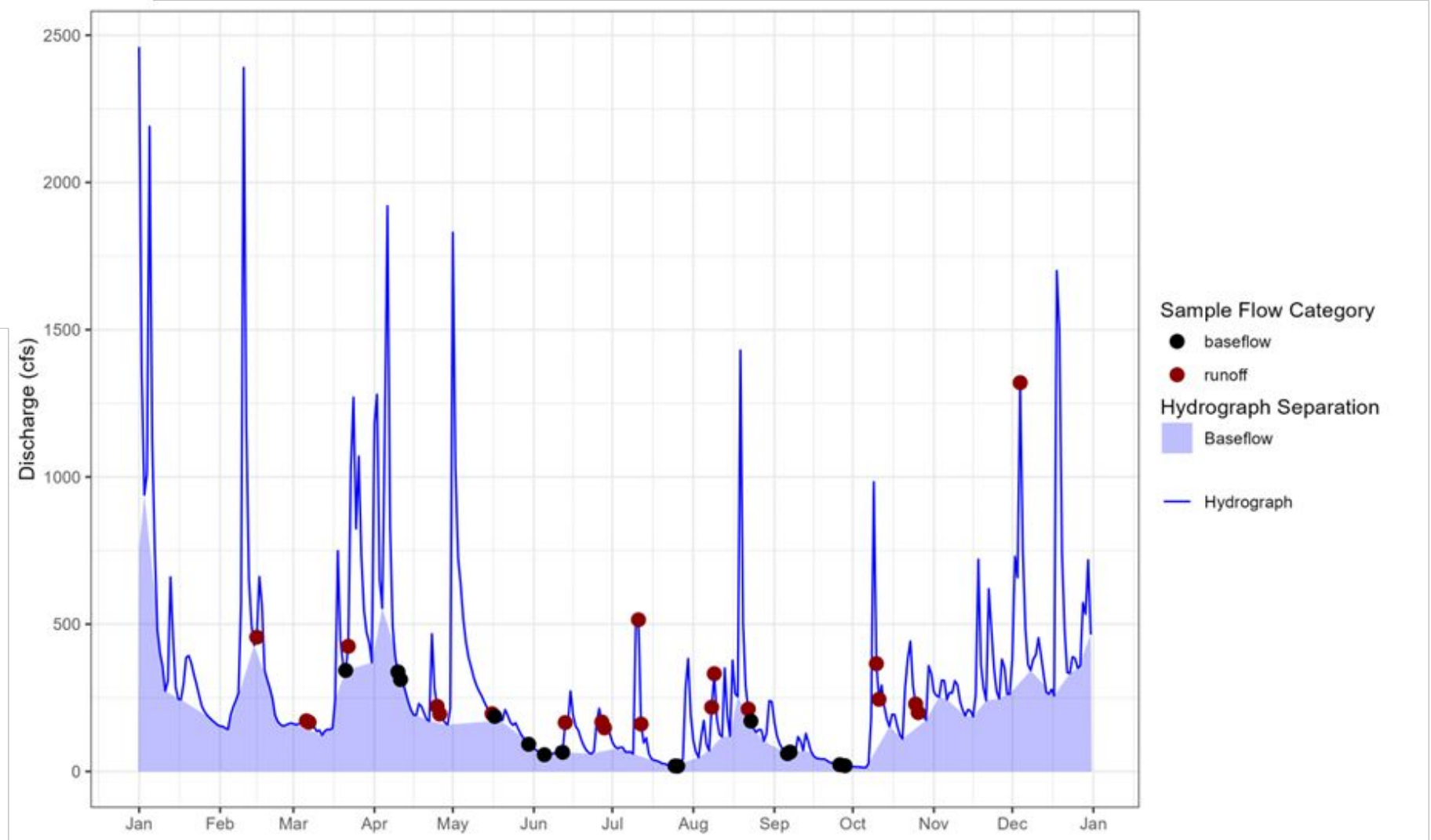


# Tributary Monitoring 2023

Sandy Creeks 9EP - Daily Discharge and Sampling Dates



*Captured baseflow and runoff periods* ✓



Now, we can estimate *nutrient loads*:

$$Load_{TP} = Concentration * Flow$$

↓  
*TP measurements*

\*

↓  
*Field and estimated*



# Generalized Watershed Loading Functions (GWLF)

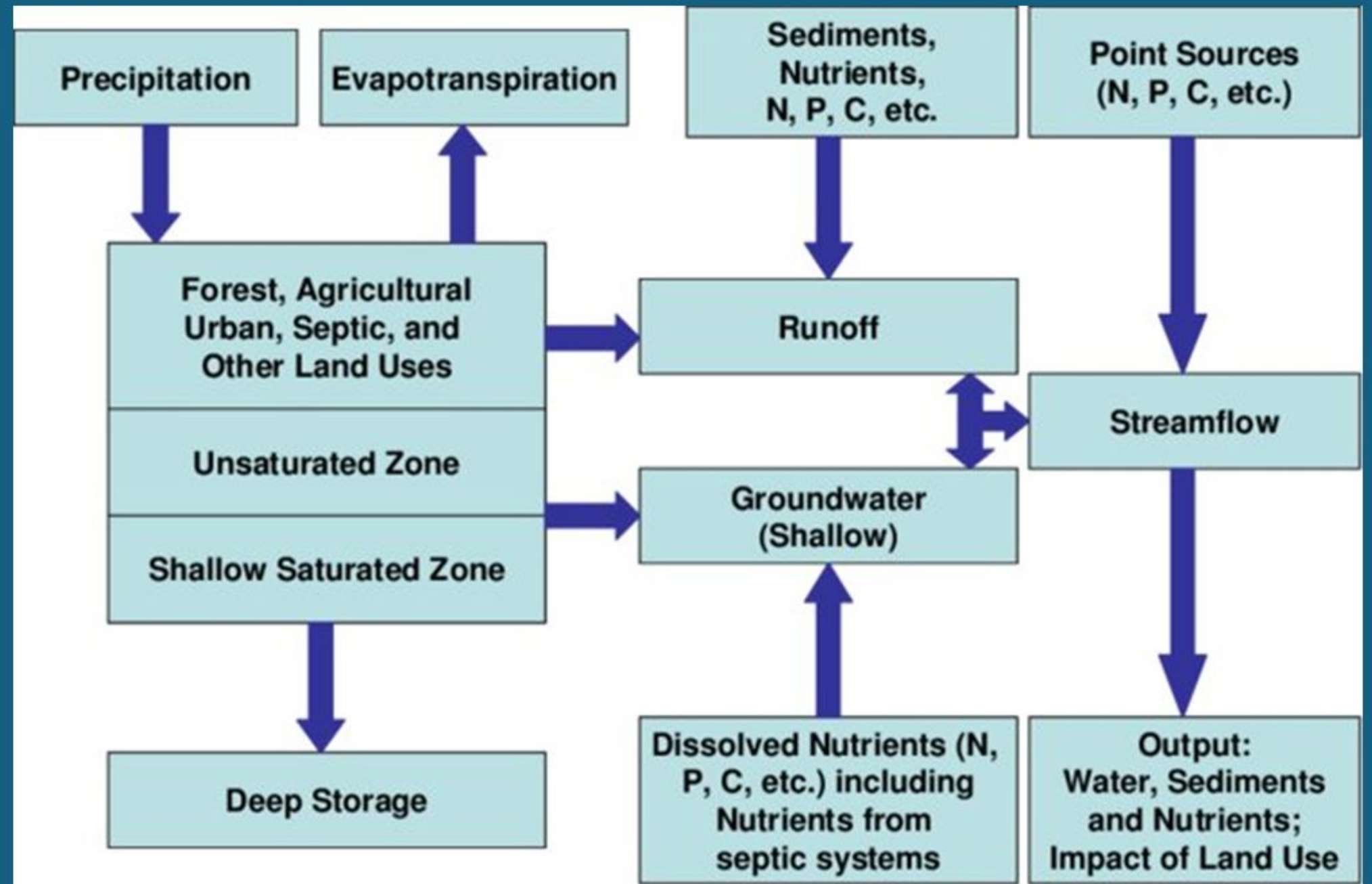
## Watershed Model

**Empirical Load<sub>TP</sub>** (kgP/ha)  
2023 monitoring data



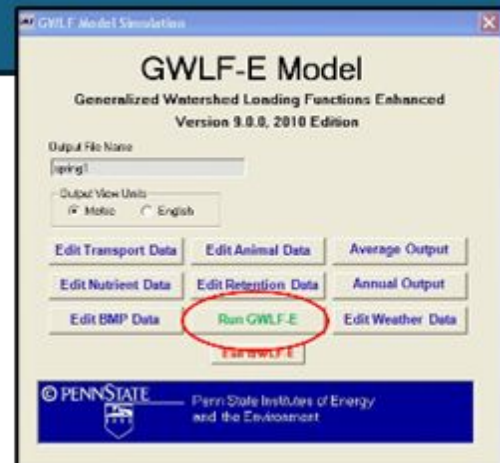
**GWLF Load<sub>TP</sub>** (kgP/ha)  
Input files, other data (land cover, etc.)

*Each HUC12:*



Rangarajan *et al.* 2008

*Using concentration/flow data (measured) to establish GWLF model – now, can evaluate scenarios*



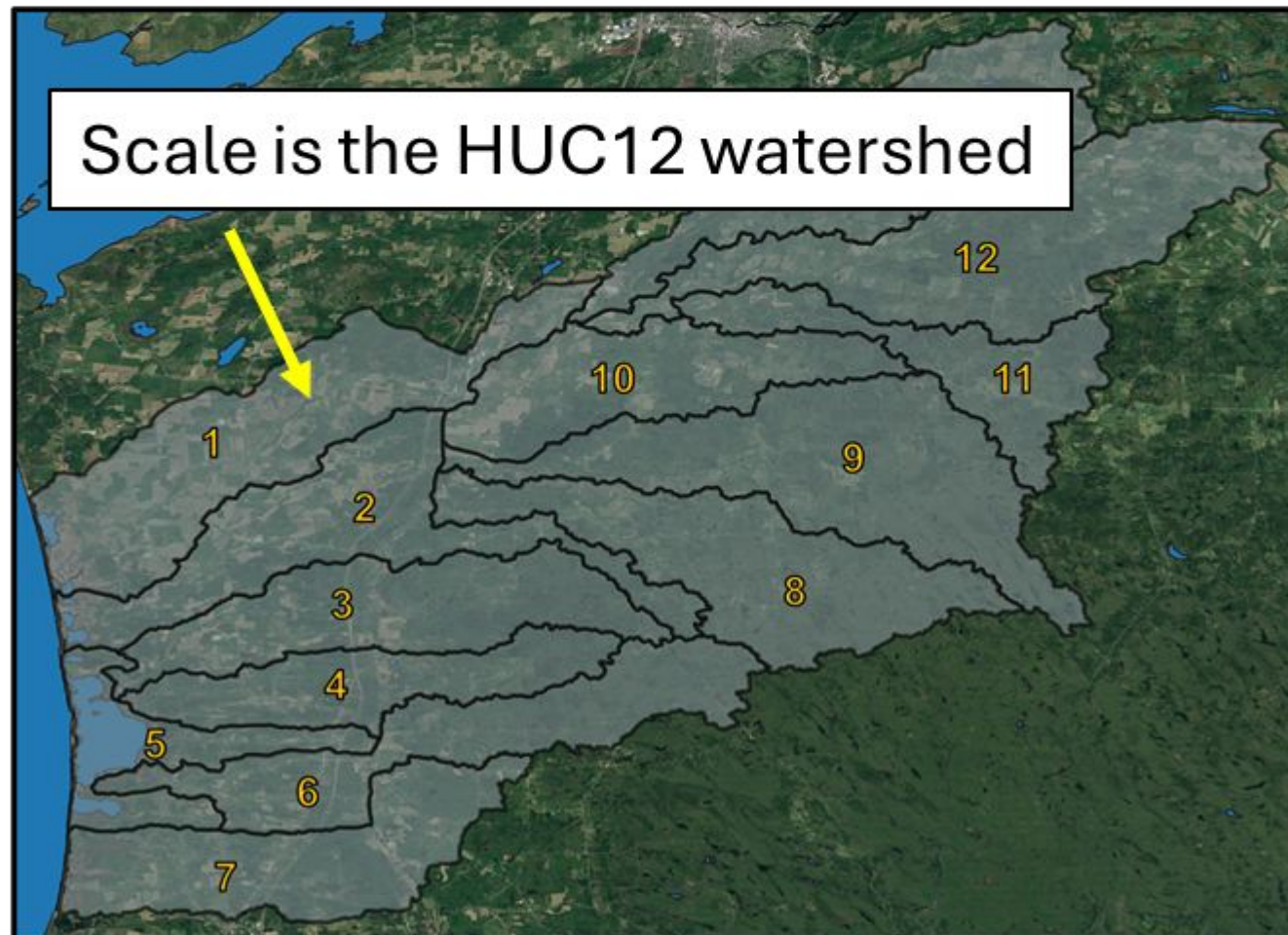


# Watershed Models Scenarios

*“If X, then estimated TP loads increase/decrease by Y”*

*What we can do:*

**(1)** Evaluate impacts at the watershed scale



## SCENARIOS SELECTED INFORMED BY YOU!

**(2)** Evaluate scenarios that are within the capability of the model and the data

**(3)** Evaluate scenarios that are meaningful and applicable to the 9E plan  
*- Relate to implementation/actions/goals*

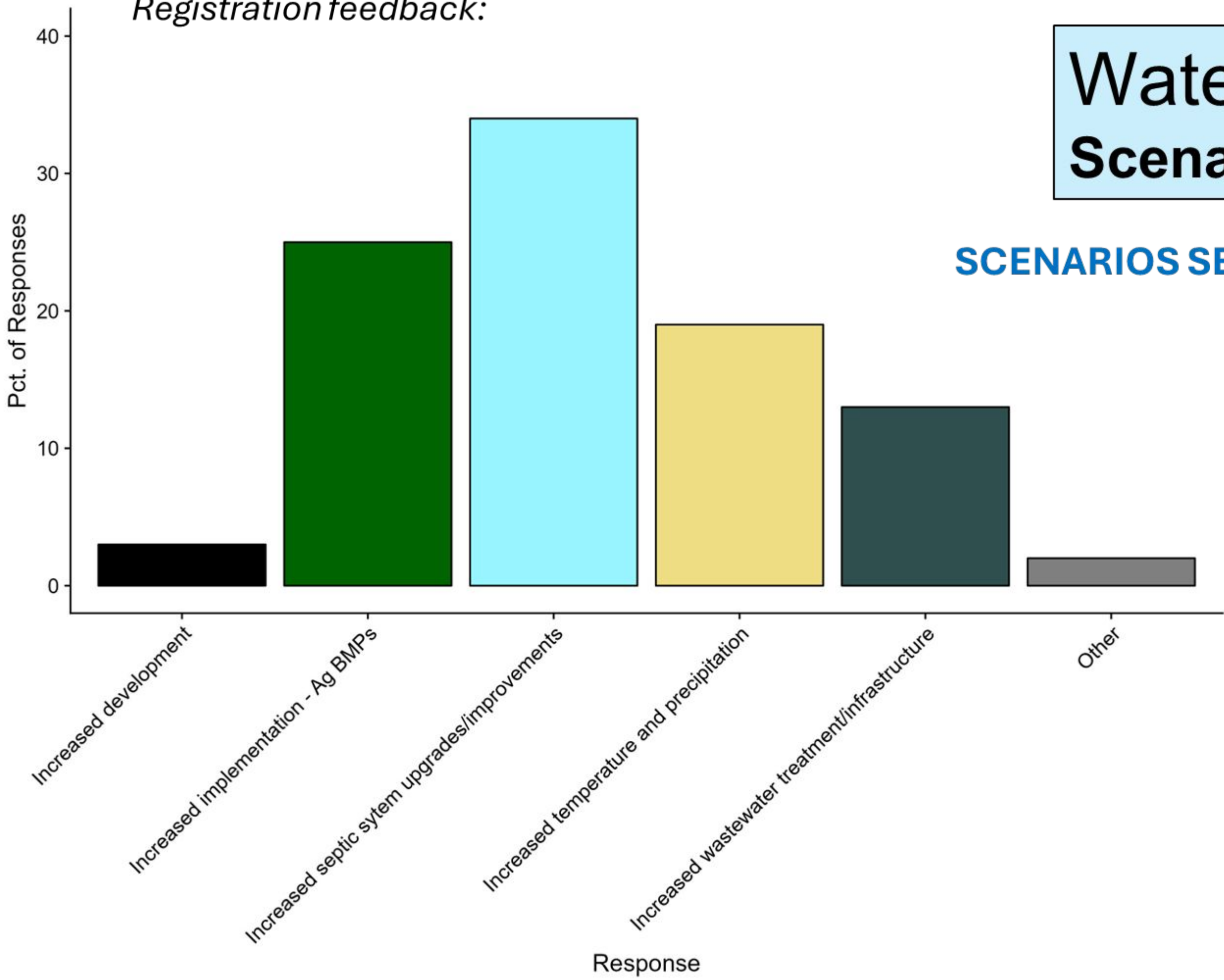
**(4)** Evaluate scenarios individually, or in combination



*Registration feedback:*

**Watershed Models  
Scenarios**

**SCENARIOS SELECTED INFORMED BY YOU!**





# Watershed Models Scenarios

*“If X, then estimated TP loads increase/decrease by Y”*

## Up to 5 scenarios

### **Examples:**

*Increased precipitation and temperature by 10%,  
and 25% increased in developed land cover*

**Scenario 1:** Future conditions (weather) and land development

**Scenario 2:** Scenario 1 with forest/regeneration BMP → *50% increase in reforestation of fallow fields*

**Scenario 3:** Scenario 1 with agricultural BMP → *25% increase in cover crops*

**Scenario 4:** Scenario 1 with septic system upgrades/replacement

**Scenario 5:** Scenario 1 with Scenarios 2-4



*Comprehensive*



*50% of failing systems upgraded (assumptions)  
OR,  
100% removal of septic systems (sewered)*





# Watershed Models Scenarios

*“If X, then estimated TP loads increase/decrease by Y”*

**Up to 5 scenarios**

*Values to be determined based on technical input, feasibility, etc.*

**Scenario 1:** Future conditions (weather) and land development

**Scenario 2:** Scenario 1 with forest/regeneration BMP

**Scenario 3:** Scenario 1 with agricultural BMP

**Scenario 4:** Scenario 1 with septic system upgrades/replacement

**Scenario 5:** Scenario 1 with Scenarios 2-4

**Discussion and Feedback**



# Anticipated Timeframe

