







# A Watershed Study in Goochland and Henrico Counties

*Community Kick-Off Meeting*

*May 2, 2023*



# Introductions



Denise Moyer  
TMDL Coordinator



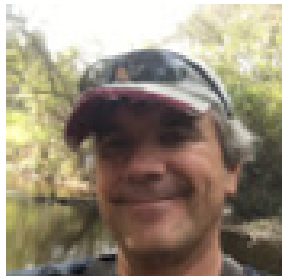
Robert Breeding  
TMDL Watershed  
Coordinator



Jennifer Palmore  
WQ Planning Team  
Leader



Piedmont WQ Monitoring Staff



Warren Smigo  
Biologist



Mike Shaver  
Biologist



# Overview

## Part I: DEQ's process for identifying & addressing impaired streams

- Water Quality Monitoring
- Assessments
- TMDL Studies
- Implementation plan

## Part 2: TMDL Study Area: Watersheds of interest

## Part 3: The TMDL process

...Next steps and what you can do to help!



# Poll Question

**Have you ever been part of a watershed TMDL development?**

- 1. No, I'm new to this.**
- 2. Yes, I'm vaguely familiar with the process.**
- 3. Yes, I'm very familiar with the process.**

**Part I:**

**The DEQ Process  
for Identifying &  
Addressing  
Impaired Streams**





# Federal Clean Water Act (1972)

Requires states to:

- Assign “designated uses” to waterways
- Develop water quality standards
- Develop a program to monitor and report on the status of its water quality
- List impaired waters & develop TMDLs





# Virginia's Water Quality Standards

WQS protect 6 designated uses

- aquatic life
- wildlife
- fishing
- shellfish
- swimming
- drinking water



# Why a study?

- **Aquatic life designated use**  
All waters should support “*the propagation and growth of a balanced, indigenous population of aquatic life*”
- **What does this mean?**  
Waters should be free of substances in harmful amounts to aquatic life
- **Monitor bugs**  
aquatic macroinvertebrates to determine if the standard is met





# Why should we care about bugs?

- Consume algae & organic matter → nutrient cycling
- Aquatic food chain
- Our “canary in the coal mine”
  - Chemical monitoring = a snapshot in time
  - Relatively long lived
  - Relatively immobile



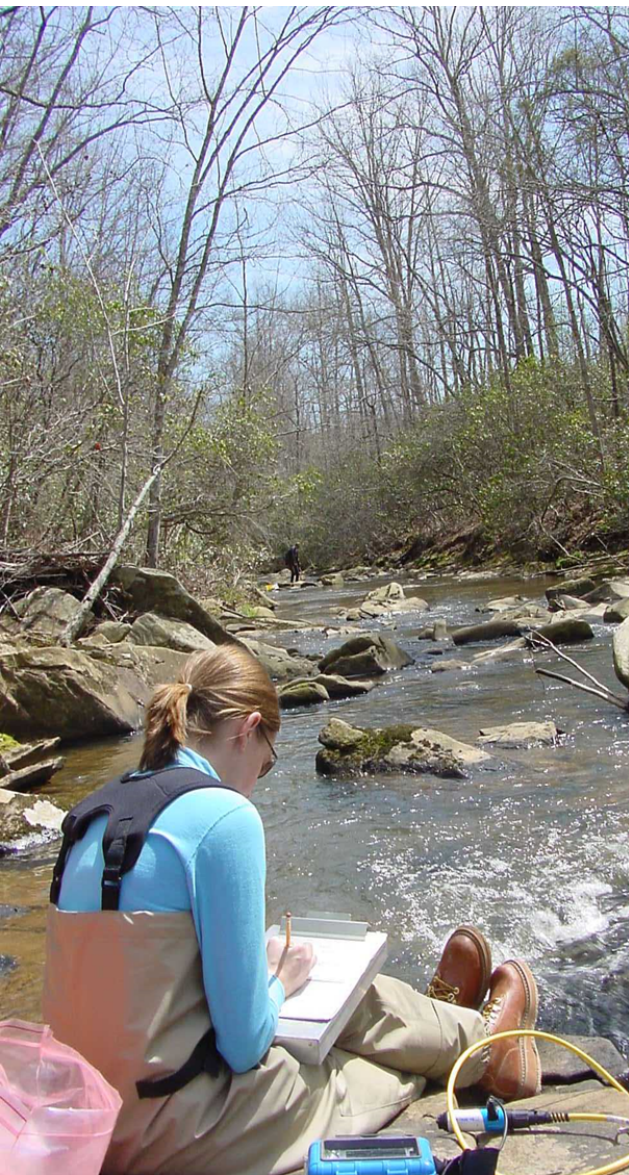
# DEQ's Water Wheel











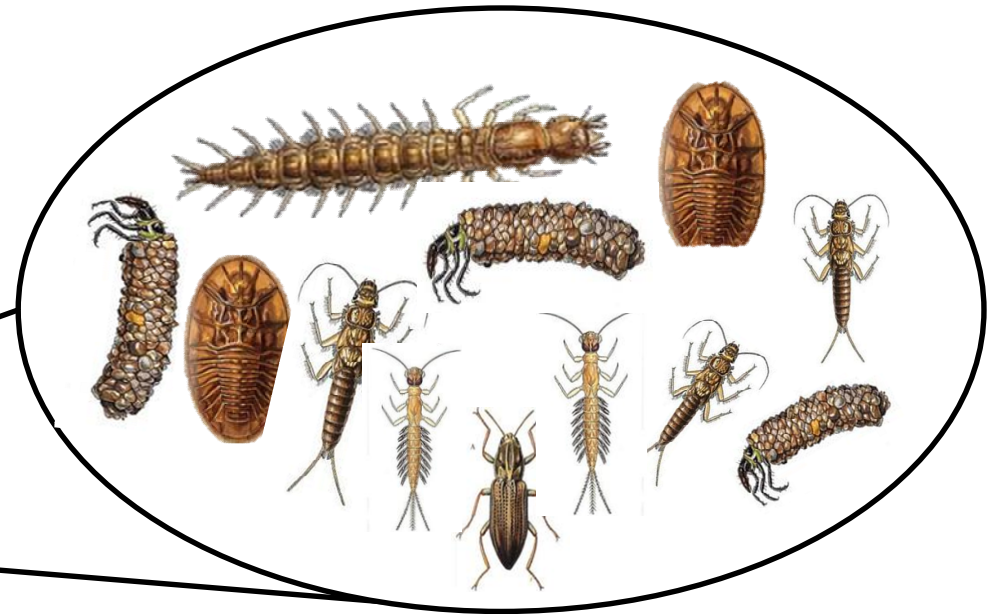


# DEQ's Water Wheel



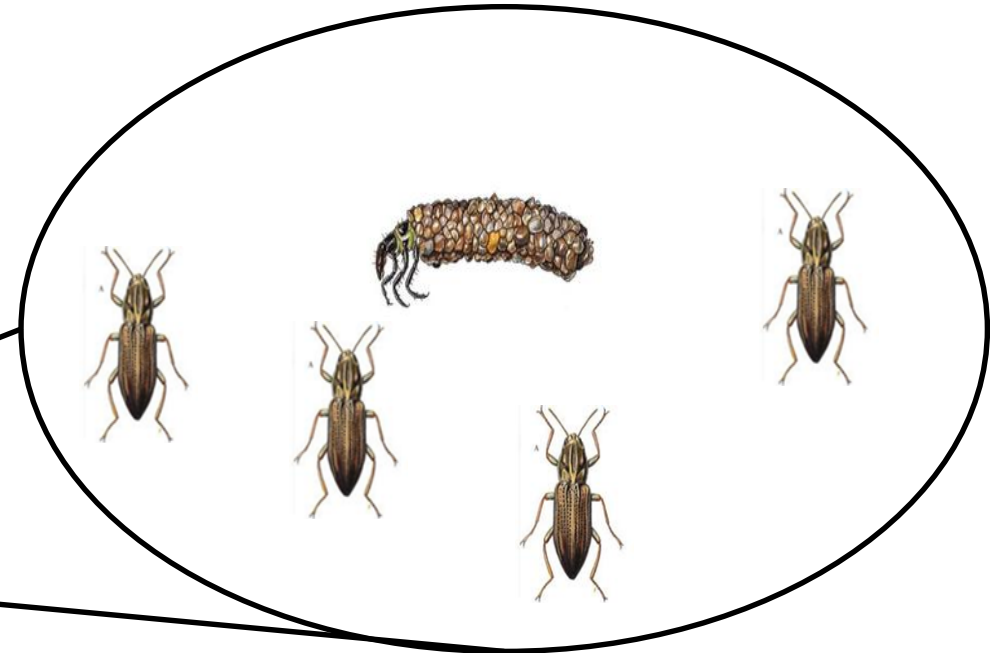
# Aquatic Life Use Impairments

Water bugs represent a longer term picture of water quality than water samples.

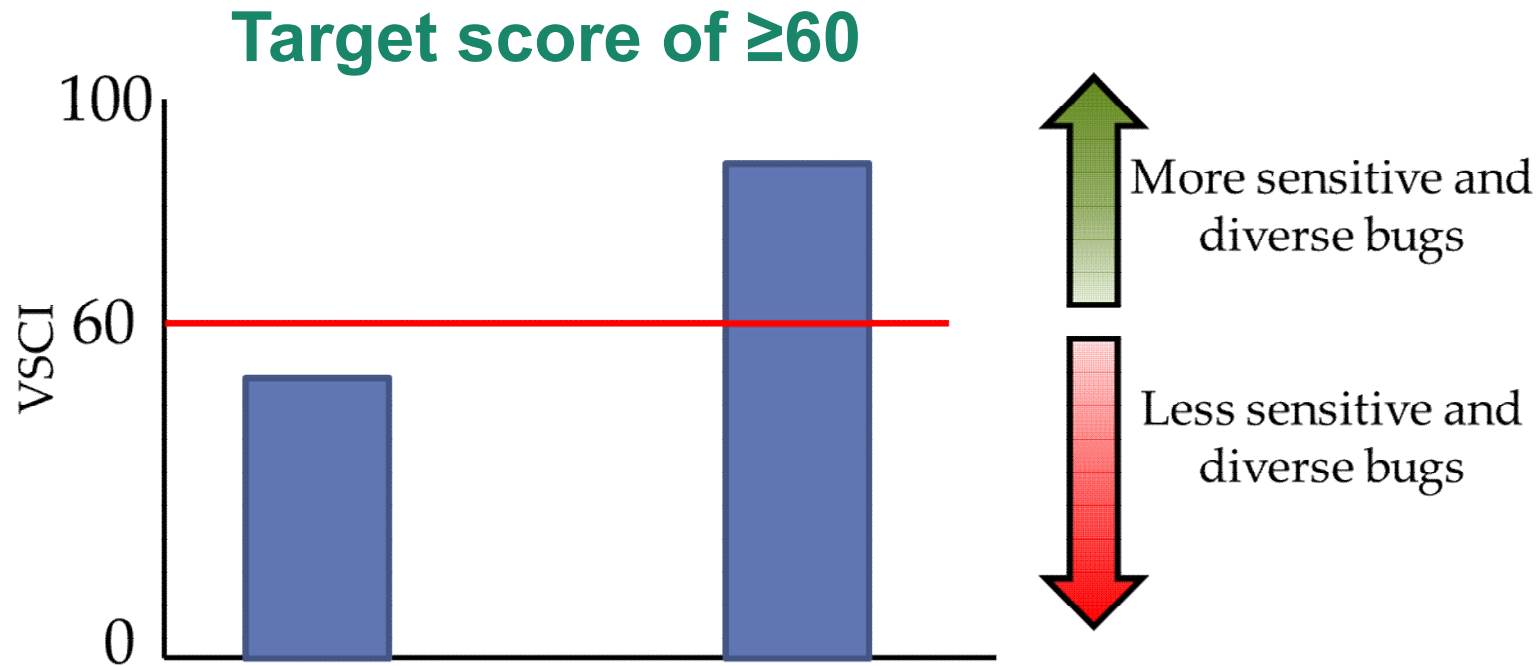


# Aquatic Life Use Impairments

Water bugs represent a longer term picture of water quality than water samples.



# Virginia Stream Condition Index (VSCI)



- Multi-metric index: Diversity, pollution tolerance, feeding group
- Tells us there is an impairment but not what the pollutant is...



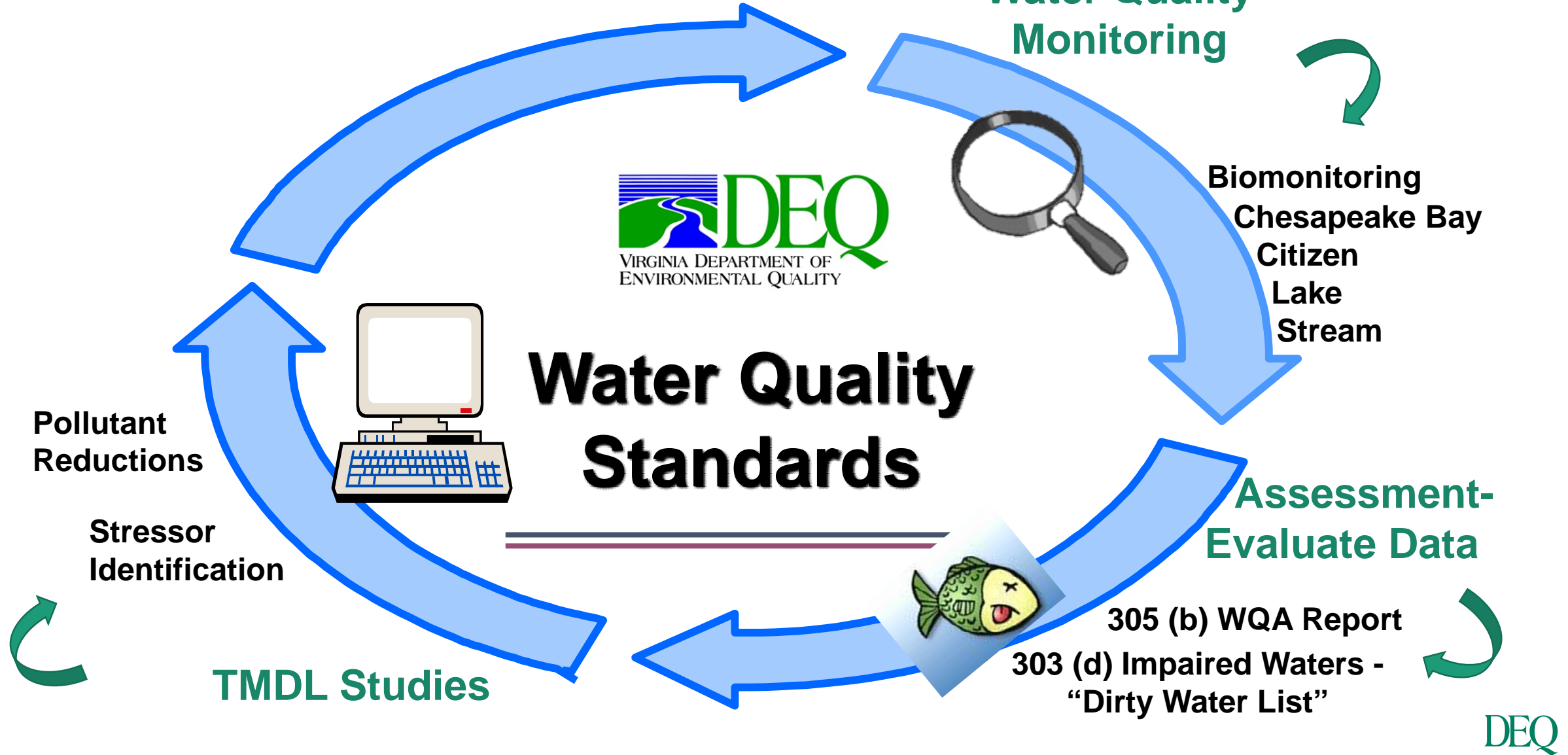
Sensitive to pollution: Stoneflies



# Sensitive to pollution: Caddisflies

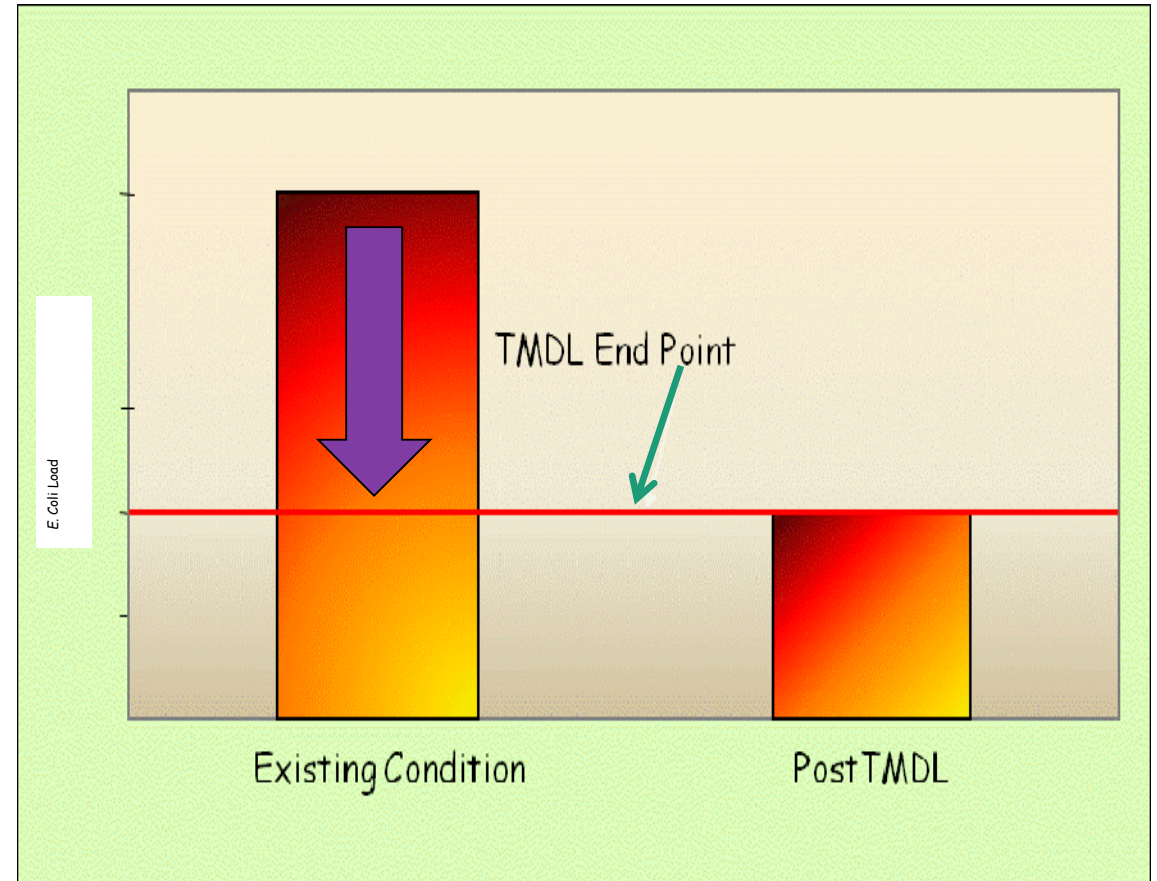


# DEQ's Water Wheel



# What is a TMDL?

- The Clean Water Act tasks DEQ to address impaired waters by conducting a Total Maximum Daily Load (TMDL) study.
- The TMDL is the amount of pollutant that can enter a waterbody and still meet the water quality standard.
- “Pollution Diet”

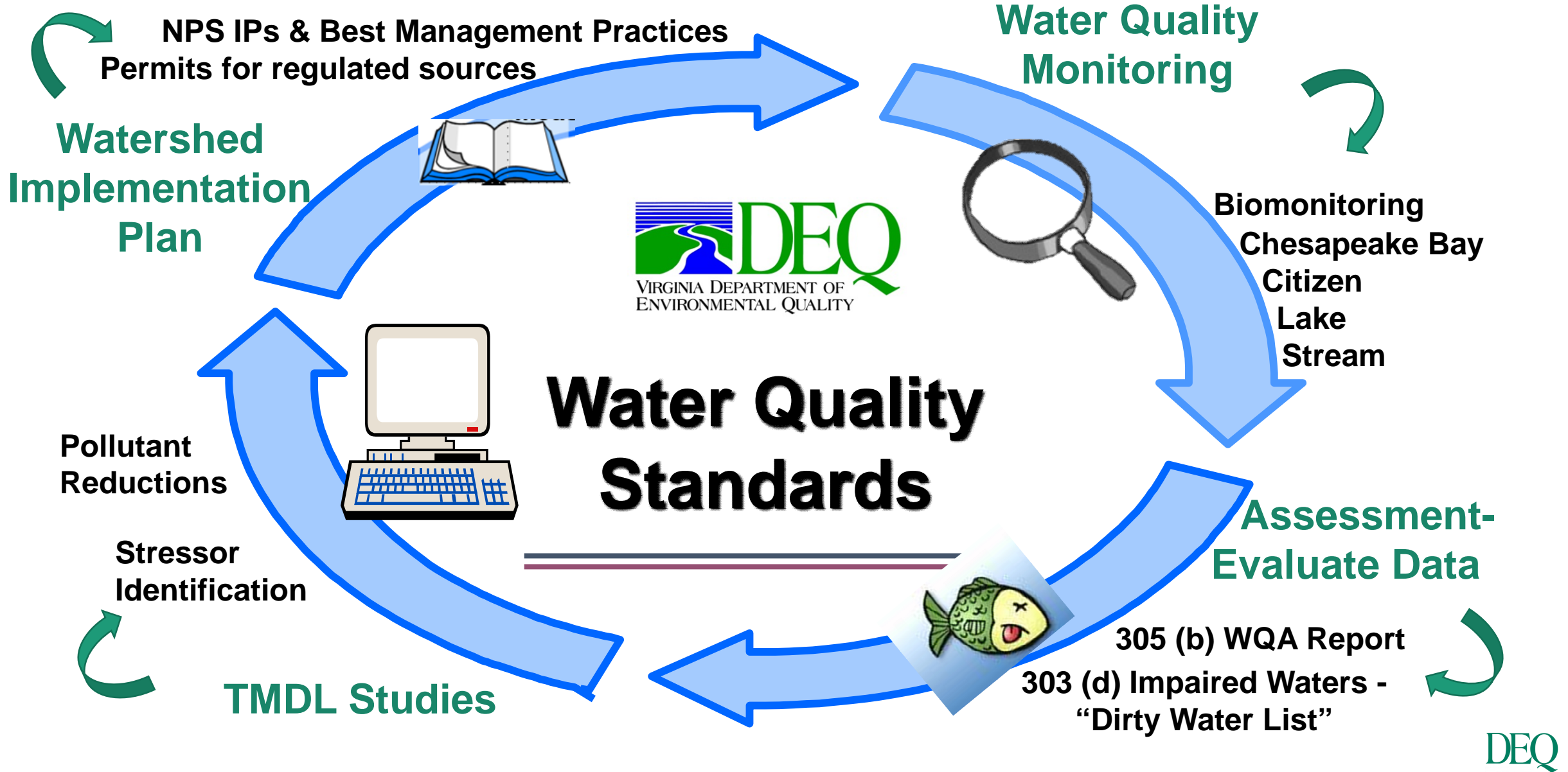


# DEQ's Water Wheel





# DEQ's Water Wheel





# Questions?





**Part II:**

## **Watersheds of Interest**





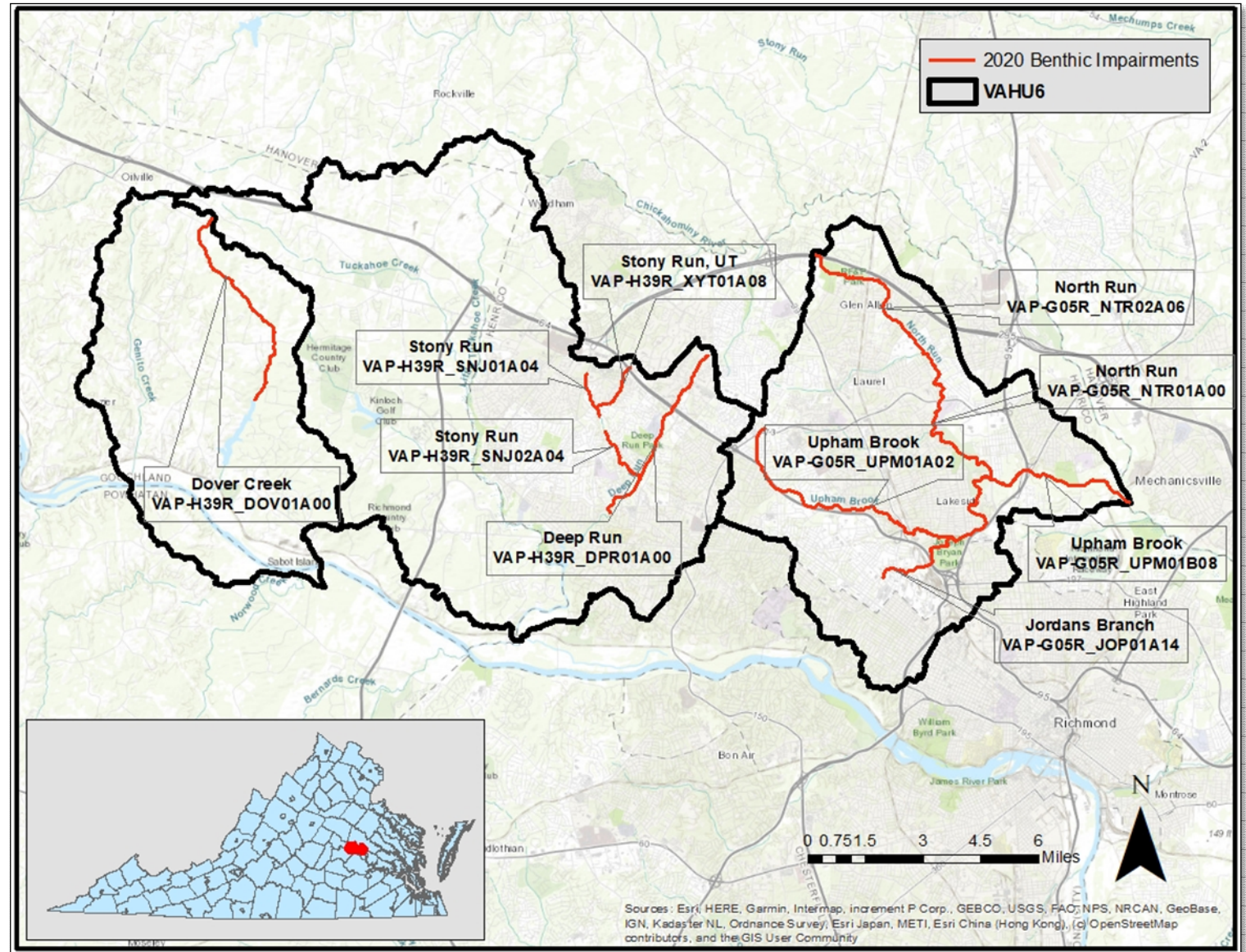
# Poll Question

**What is your interest in this project?**

- 1. I live in this area.**
- 2. I work for a facility in this area.**
- 3. I work for a facility in this area with a permit.**
- 4. I don't live or work here but I visit for recreation.**
- 5. I am just interested in what DEQ is up to.**

# Henrico & Goochland Project Area

1. Dover Creek
2. a. Deep Run  
b. Stony Run  
c. Stony Run UT
3. a. Upham Brook  
b. Jordans Branch  
c. North Run



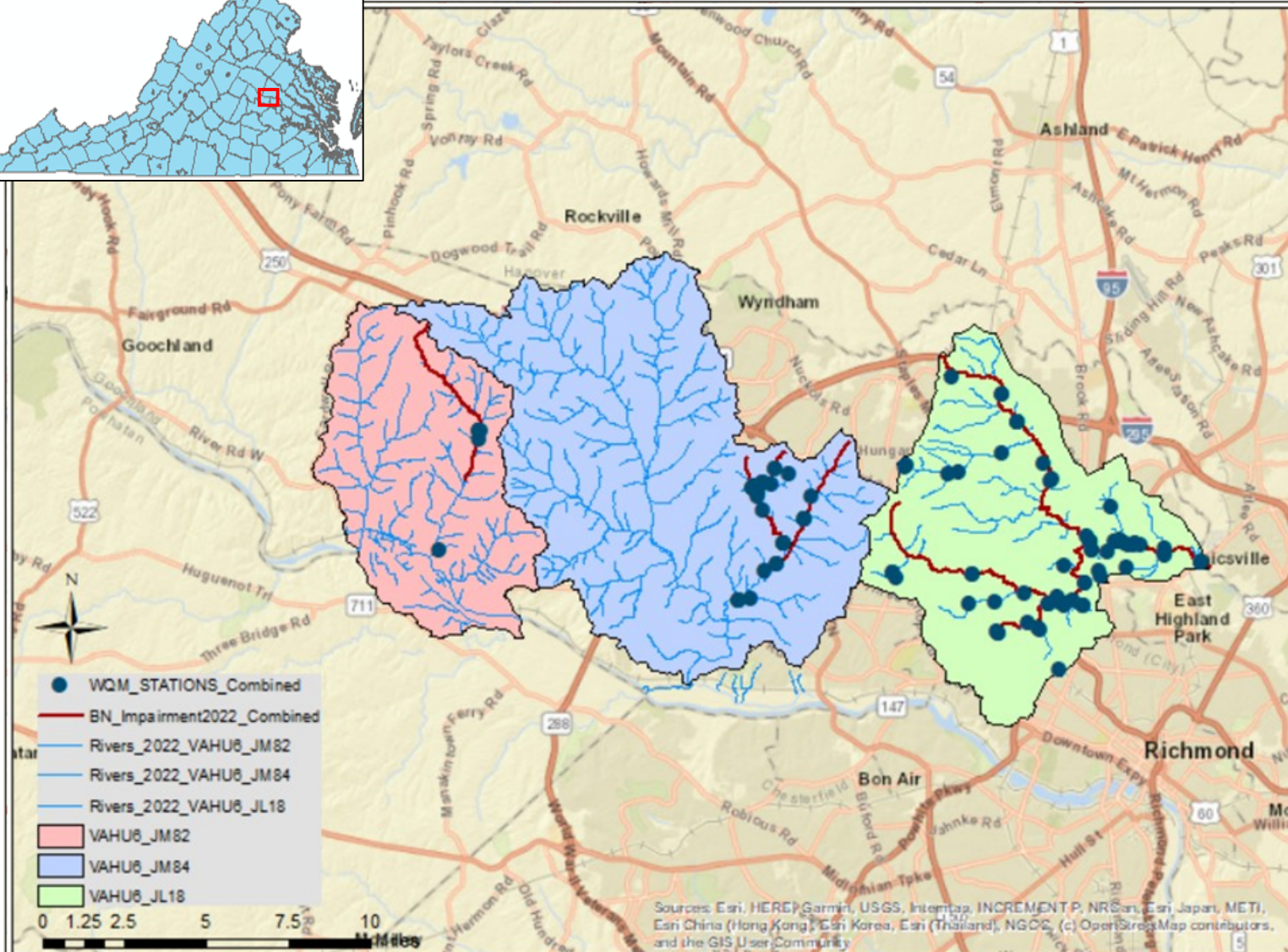
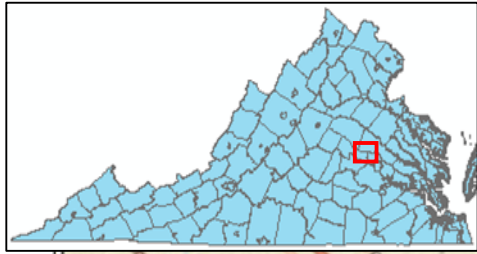
# Poll Question

**Which watershed are you here to learn more about?**

- 1. Watershed 1 (Dover Cr in Goochland Co).**
- 2. Watershed 2 (Deep Run, Stony Run, Stony Run UT).**
- 3. Watershed 3 (Upham Brook, Jordans Branch, North Run).**
- 4. Just interested in learning more about DEQ's water quality improvement process!**

Stream Name	First listed	Length (miles)	Impairment Description
Deep Run	2016	4.16	Deep Run from its headwaters to the pond at river mile 1.47
Dover Creek	2020	4.76	Dover Creek from its headwaters to the upstream limit of Dover Lake
Jordans Branch	2016	2.19	Headwaters to mouth at Upham Brook
North Run	2014	4.24	North Run from Hungary Creek to its mouth at Upham Brook
	2008	3.66	North Run from its headwaters to Hungary Creek
Stony Run	2008	1.01	Headwaters to the extent of backwater at the pond
	2016	1.35	From the dam of the pond downstream to the mouth at Deep Run
Stony Run, UT (XYT)	2008	1.27	Headwaters to the mouth at Stony Run
Upham Brook	2016	10.99	Headwaters to the mouth at the Chickahominy River, excluding Upham Brook from Flippen Creek to the UT above Wilkinson Road
29	2016	1.16	Flippen Creek downstream to UT above Wilkinson Road



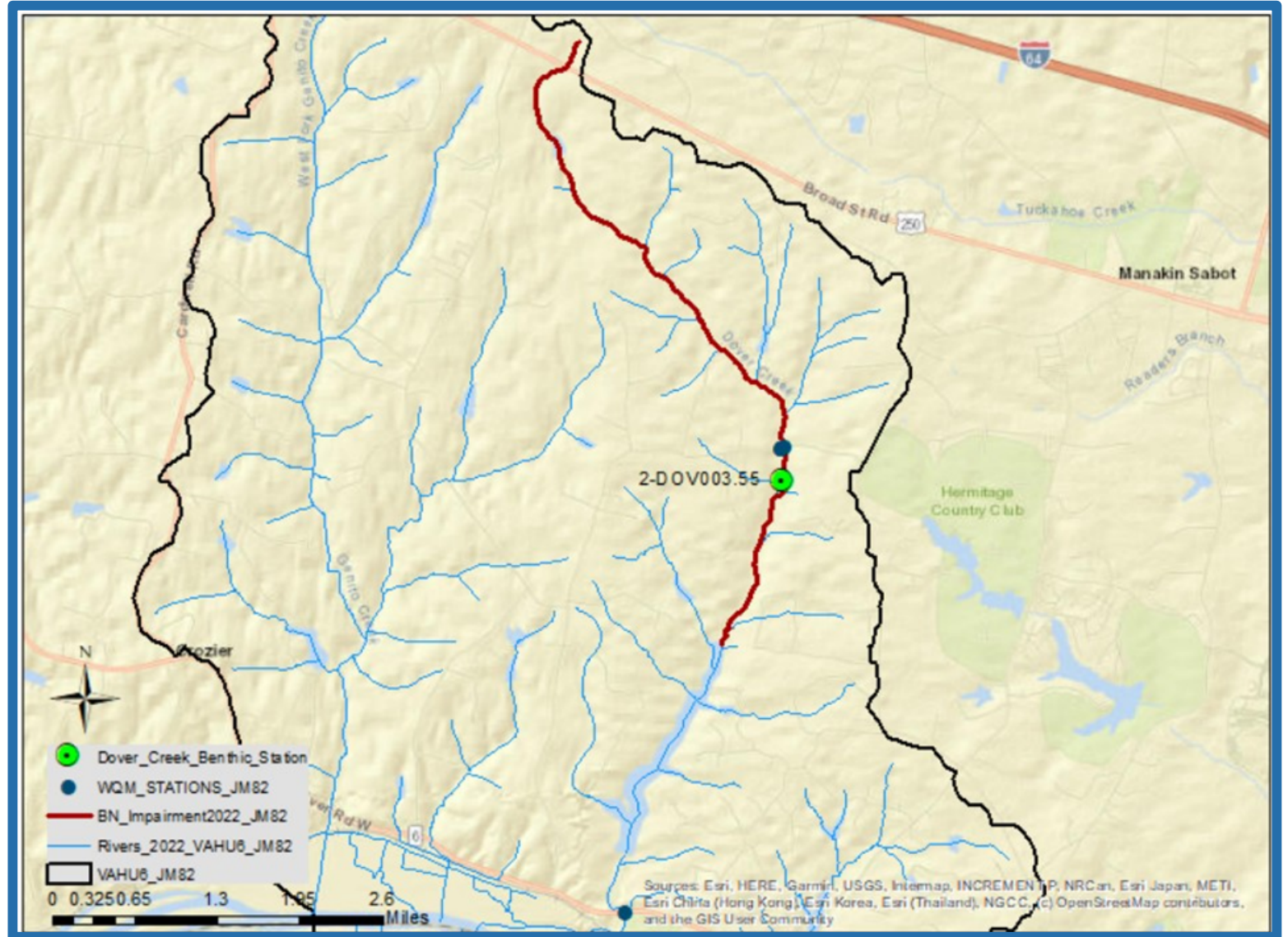


# Water Quality Monitoring

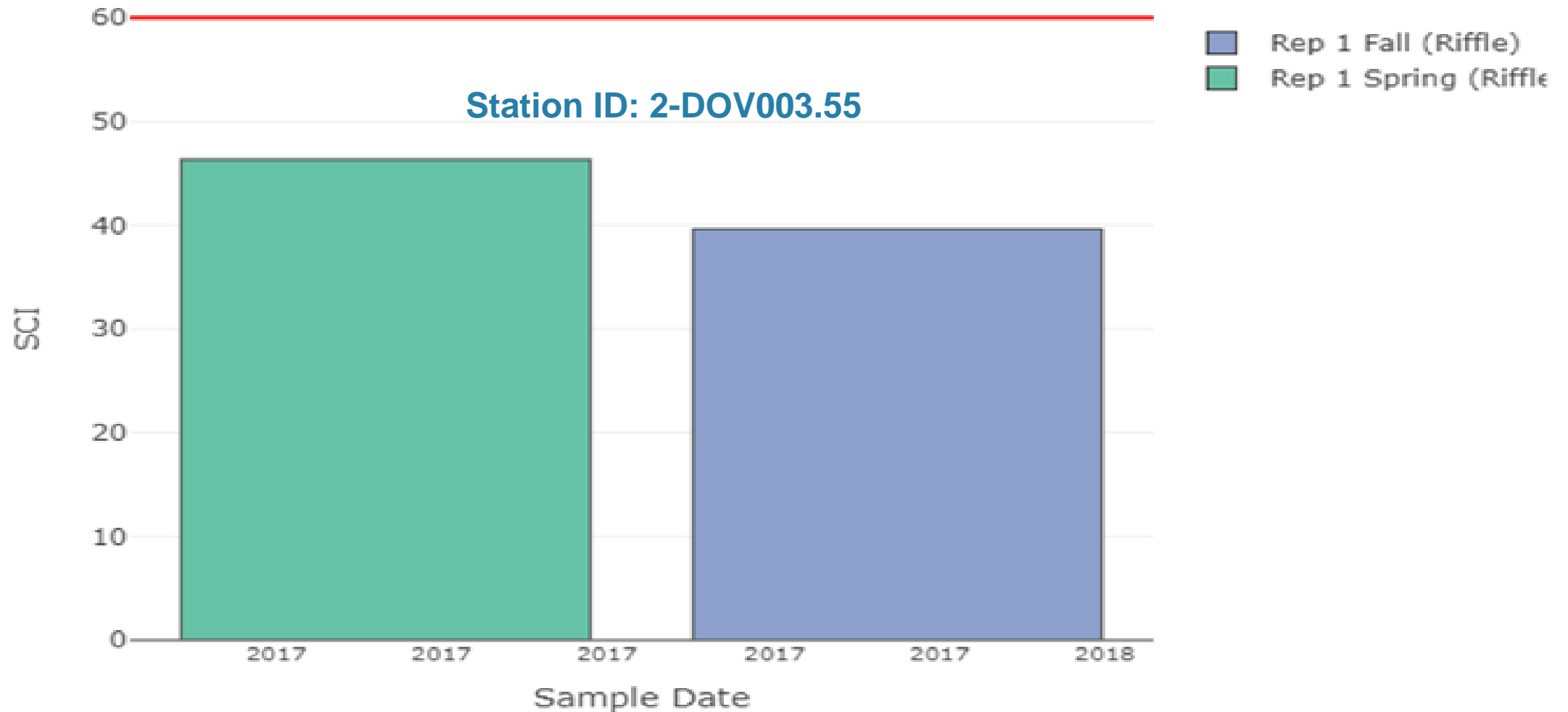
- Temperature
- pH
- Dissolved Oxygen
- Conductivity
- Nutrients
- Total Suspended Solids (TSS)
- Ions
- Metals
- And More!

# Watershed I: Dover Creek

**Impairment: 4.76 mi**  
**Headwaters to upstream**  
**limit of Dover Lake**



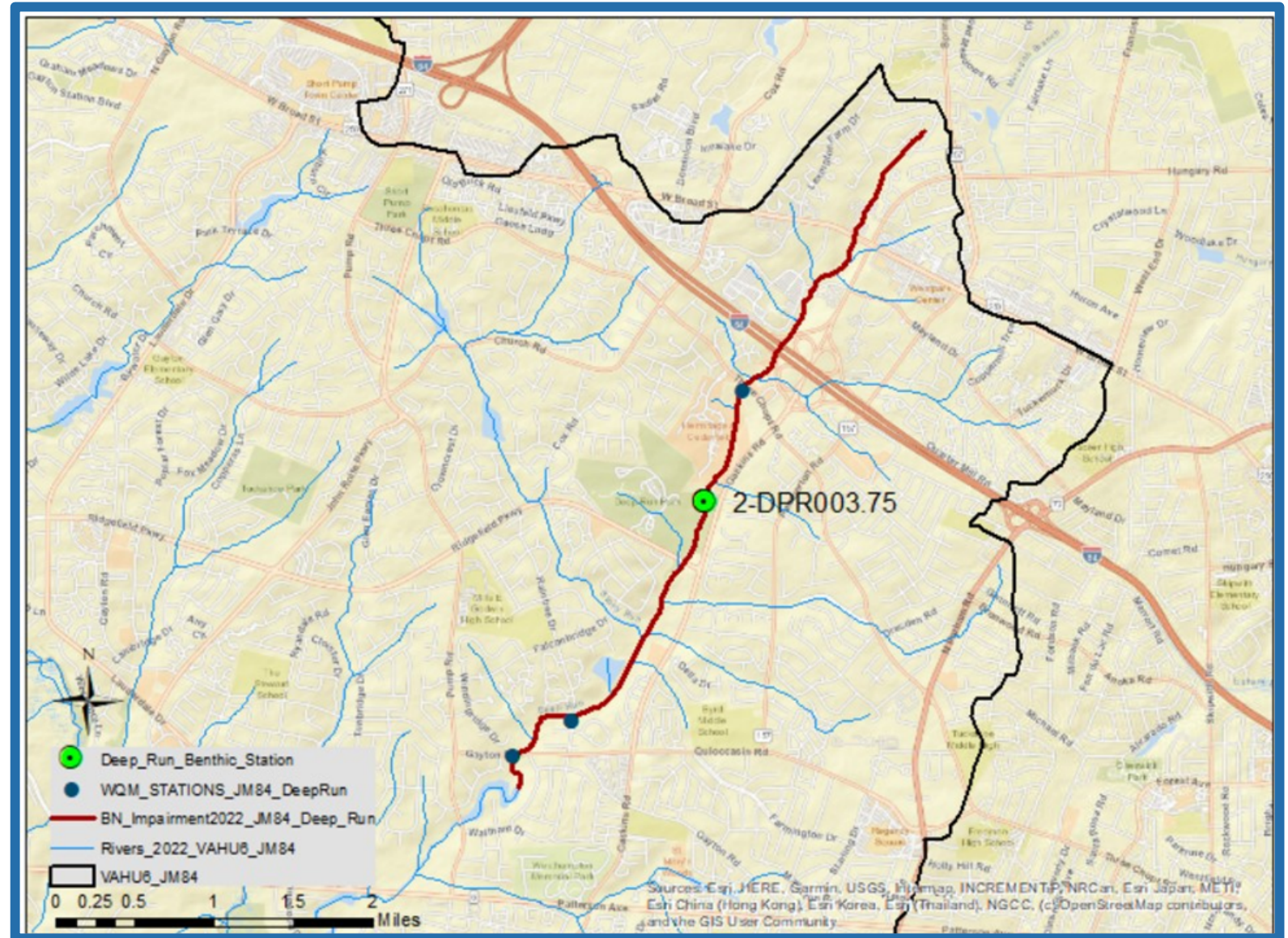
# Watershed I: Dover Creek VSCI Score





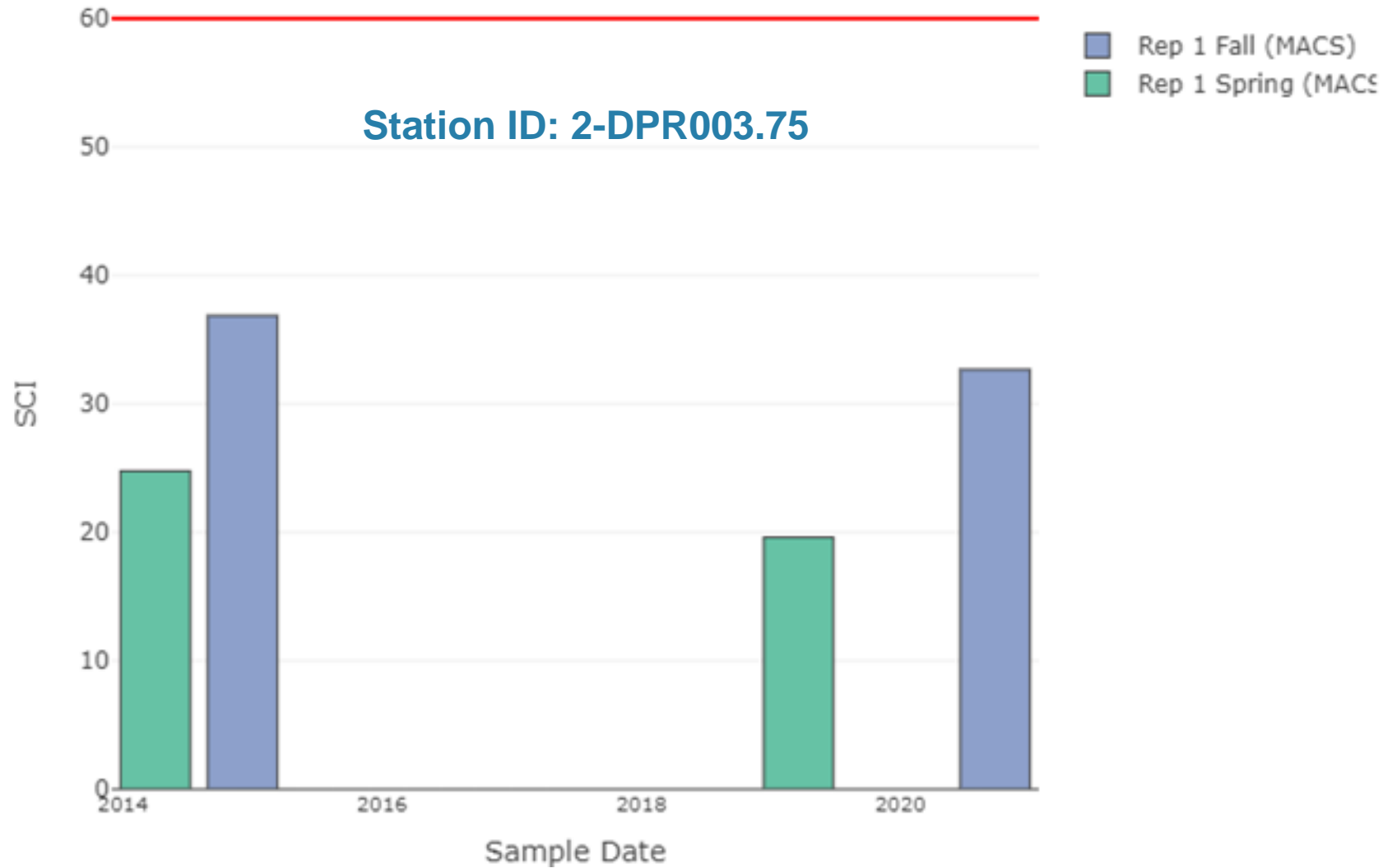
# Watershed II: Deep Run

**Impairment: 4.16 mi**  
**Headwaters to pond at**  
**RMI 1.47**



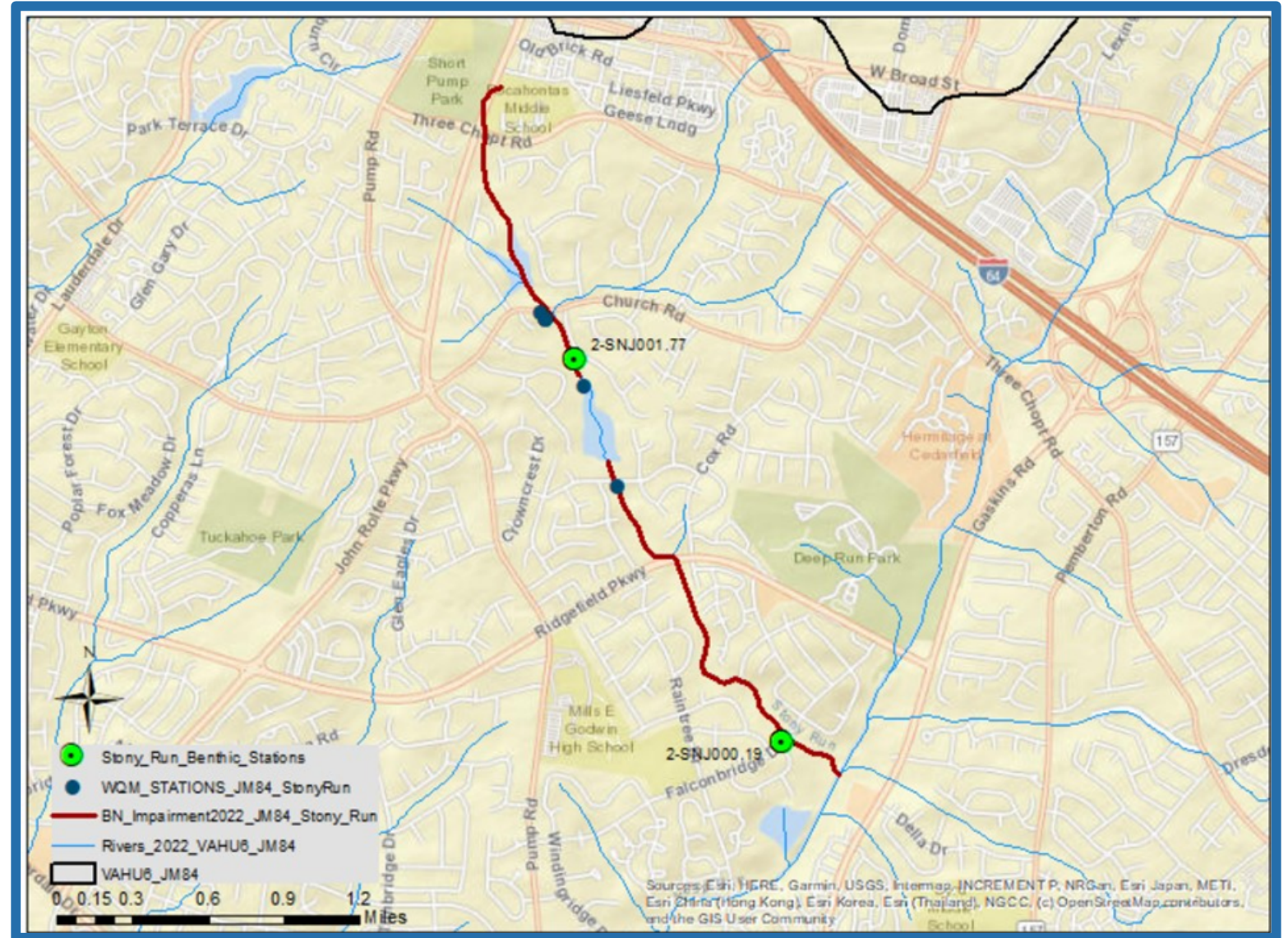


# Watershed II: Deep Run VSCI Score



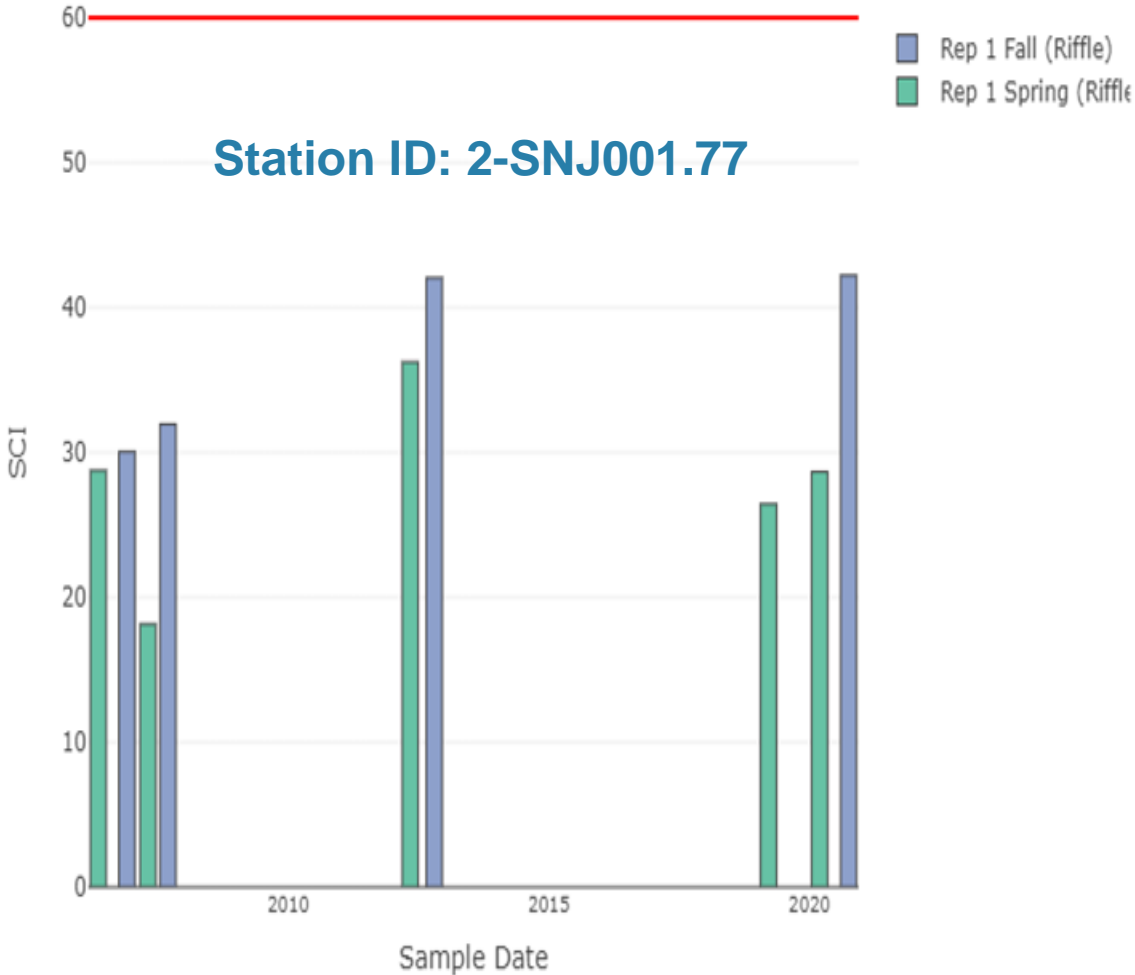
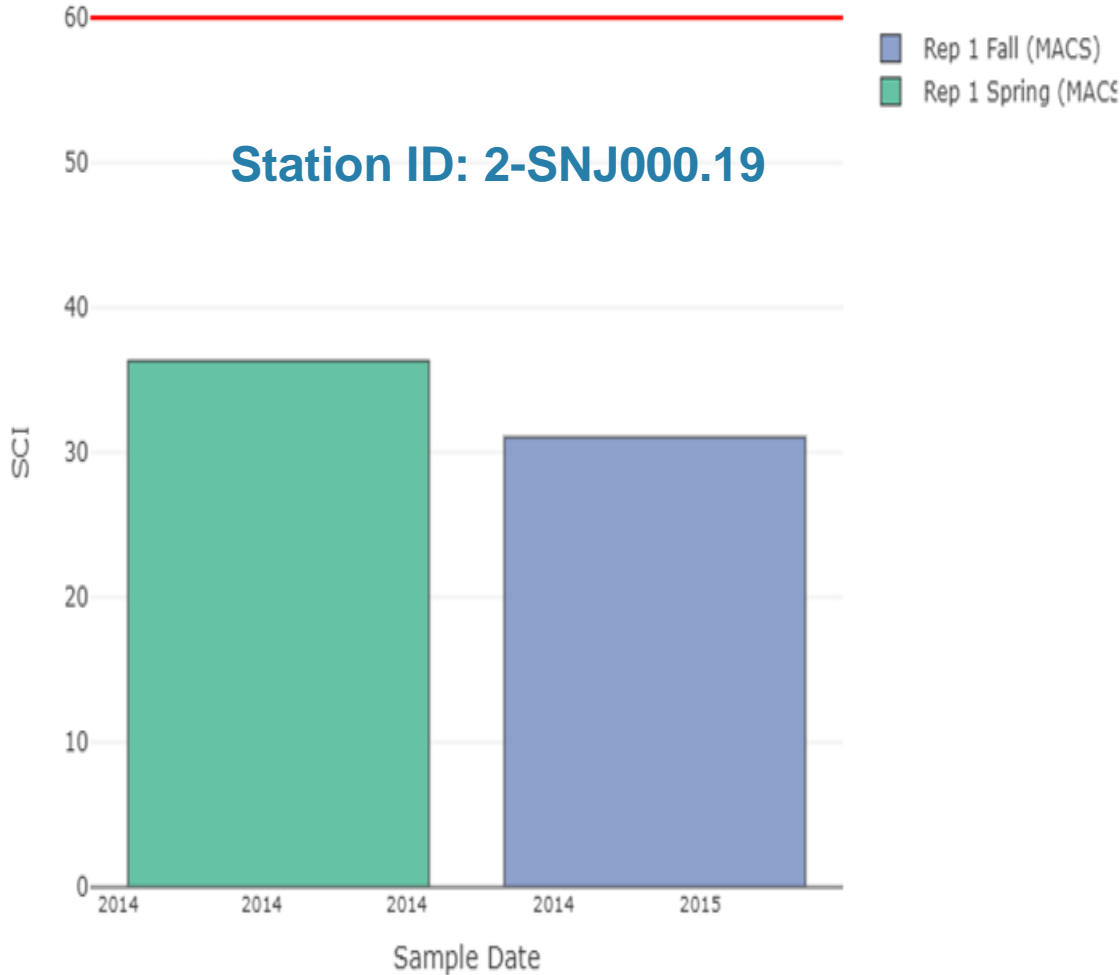
# Watershed II: Stony Run

**Impairment:**  
**1.01 & 1.35 mi**  
Headwaters to  
backwater at pond &  
from dam to mouth at  
Deep Run



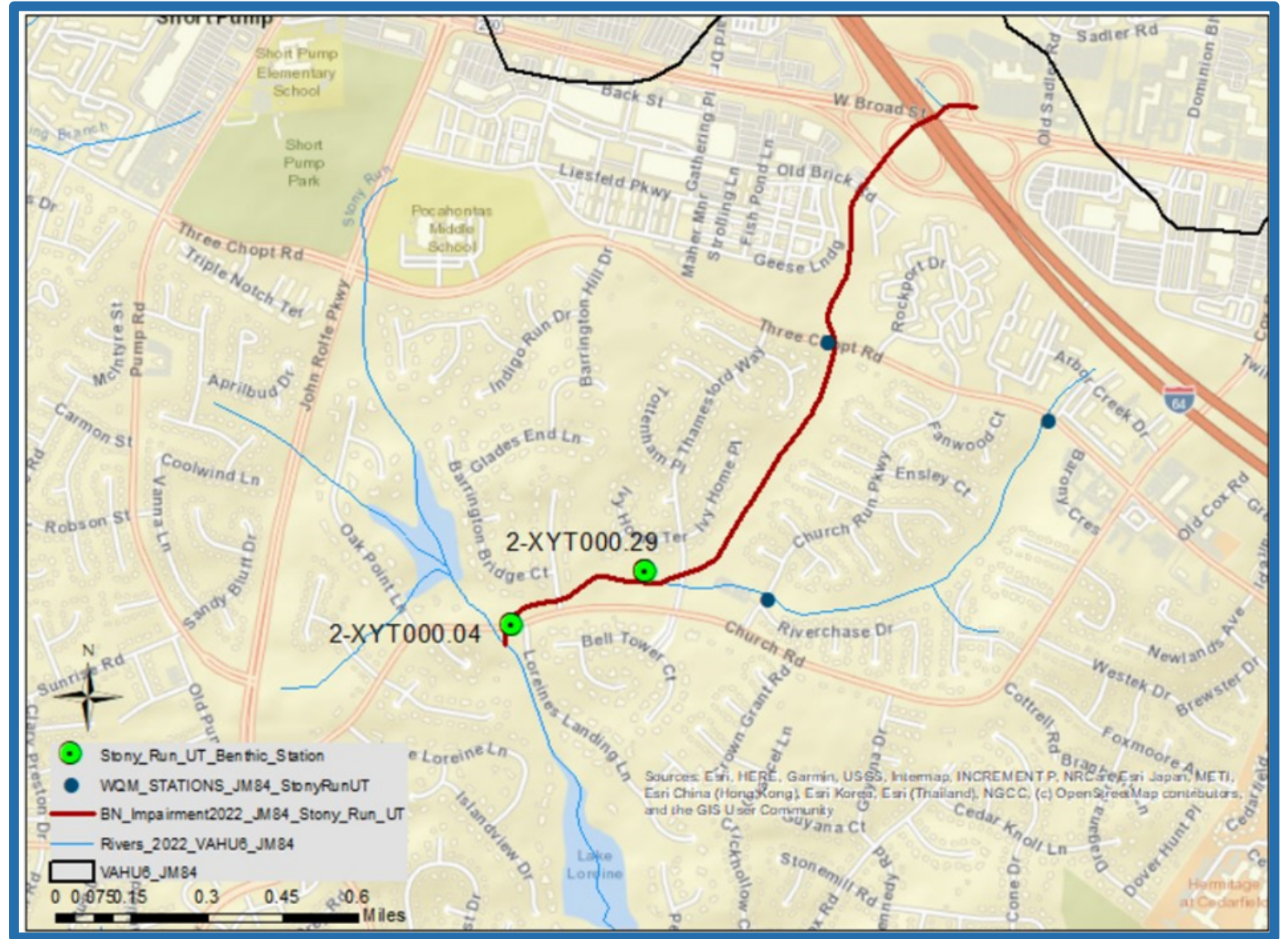


# Watershed II: Stony Run VSCI Score



# Watershed II: Stony Run UT

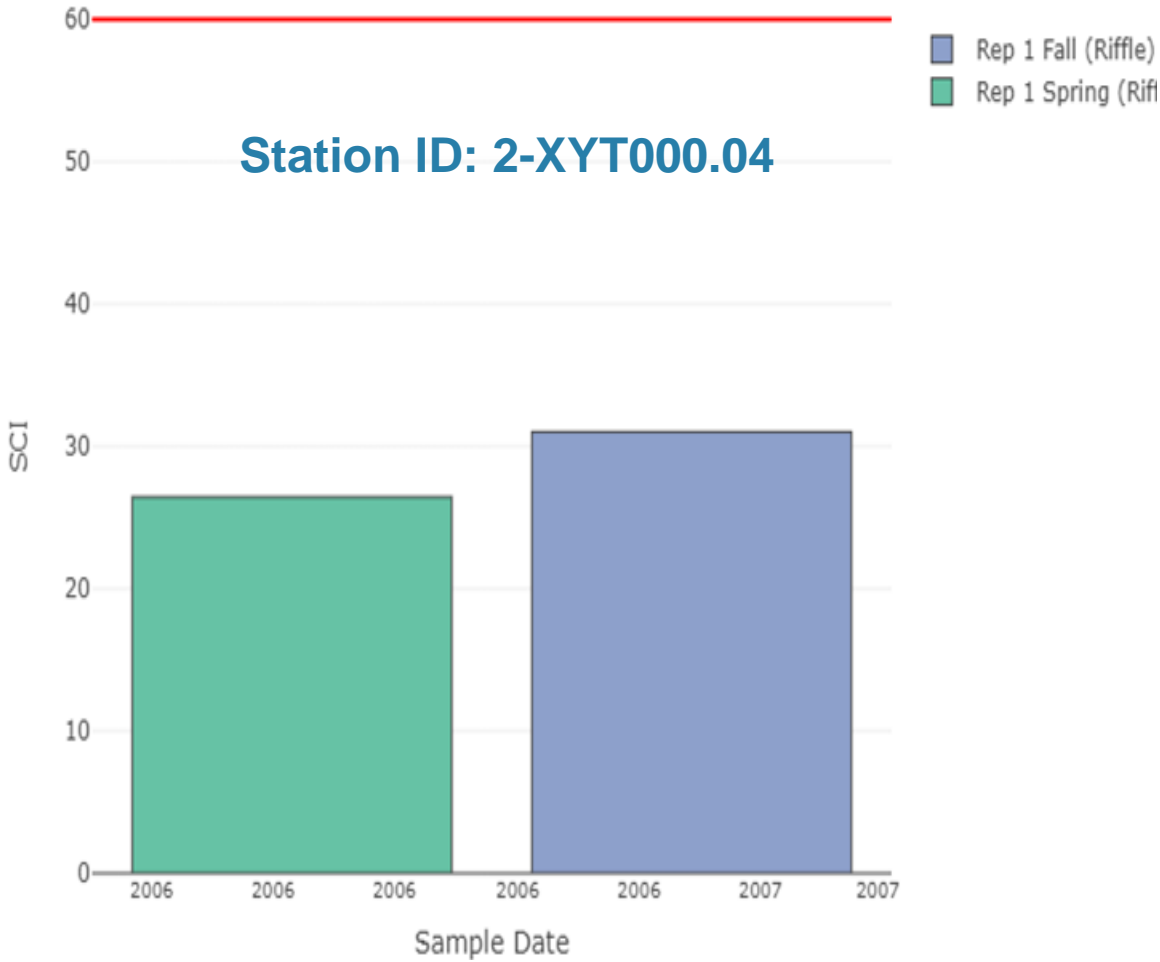
**Impairment: 1.27 mi**  
**Headwaters to mouth**  
**at Stony Run**



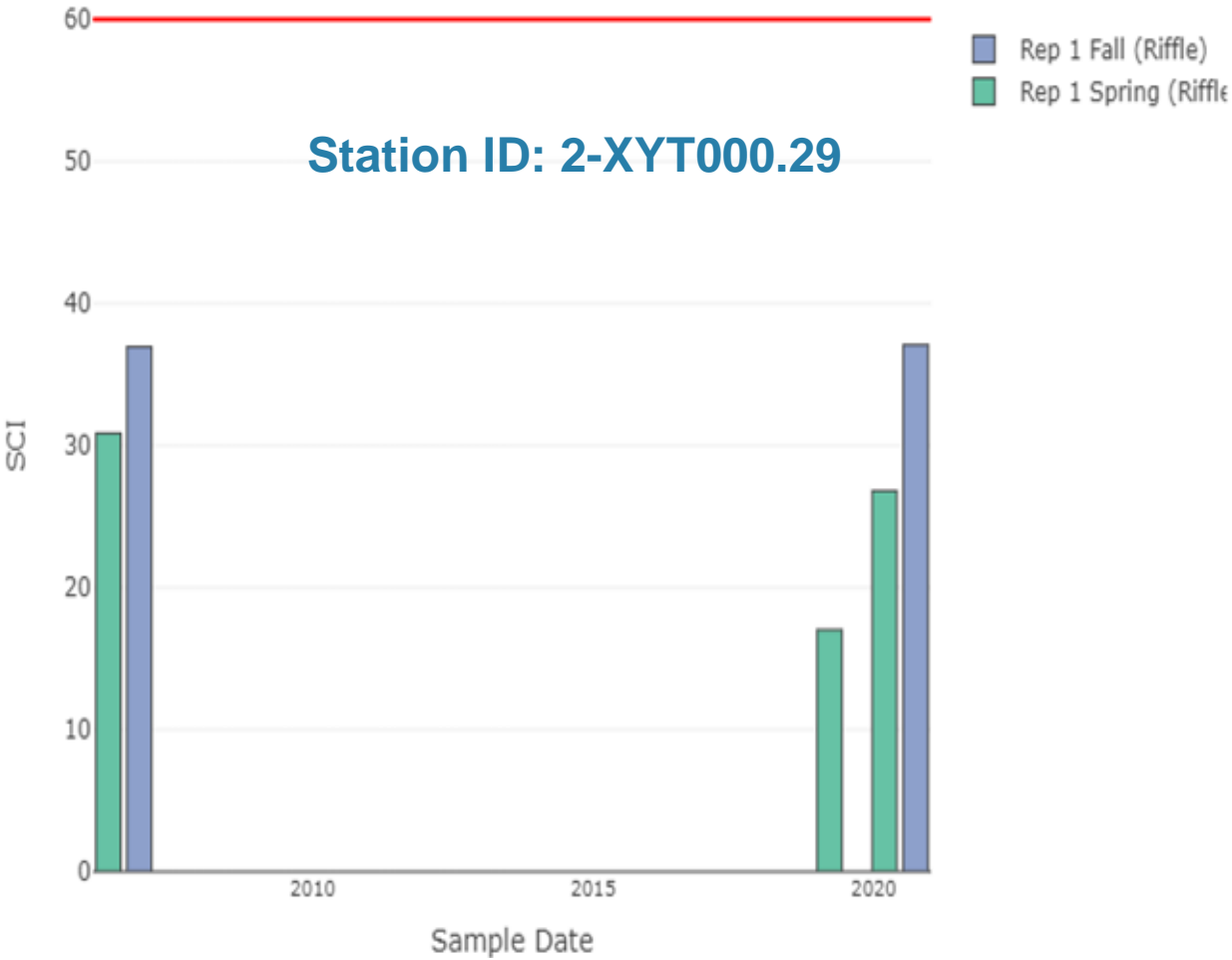


# Watershed II: Stony Run UT VSCI Score

Station ID: 2-XYT000.04

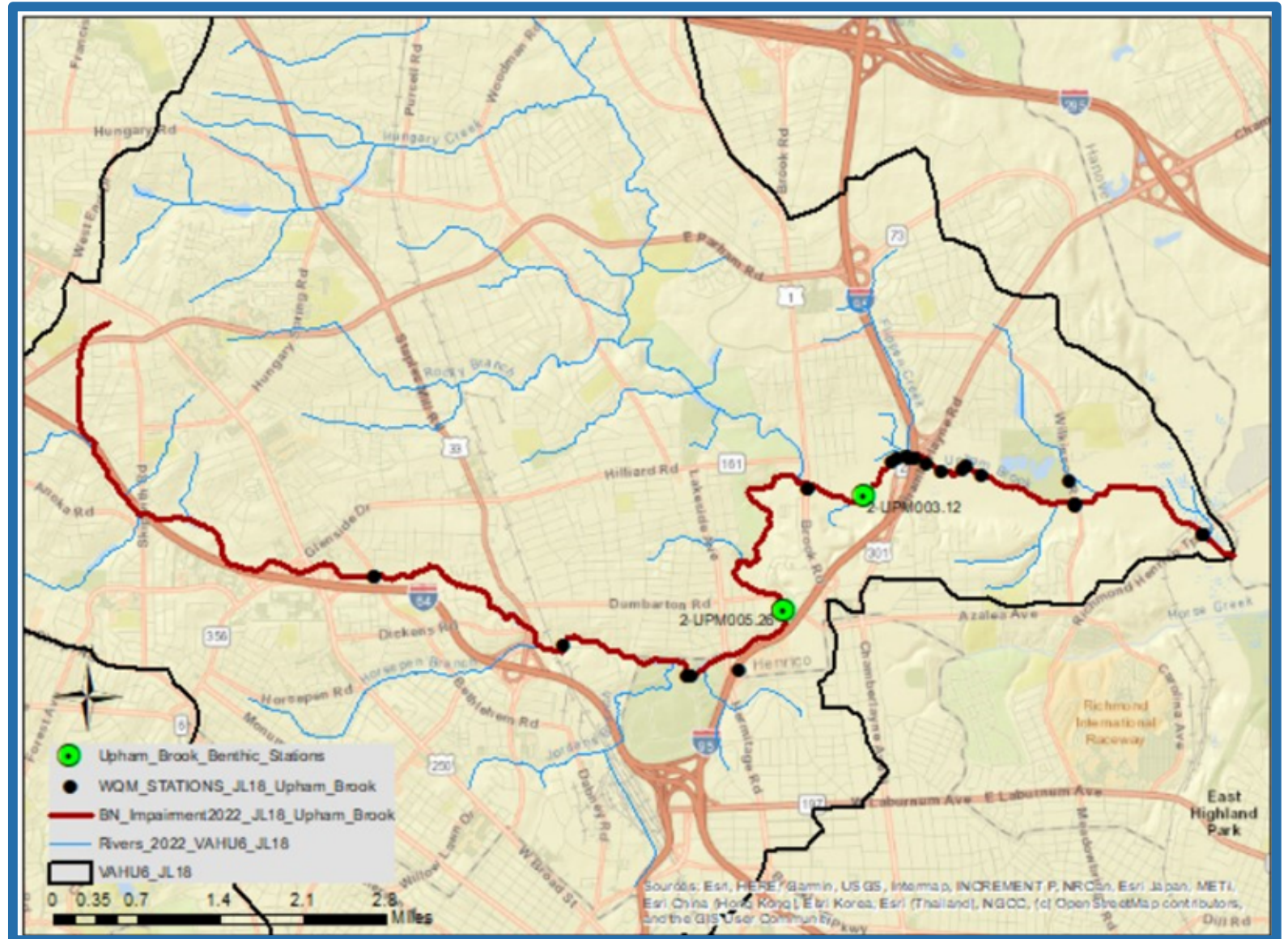


Station ID: 2-XYT000.29



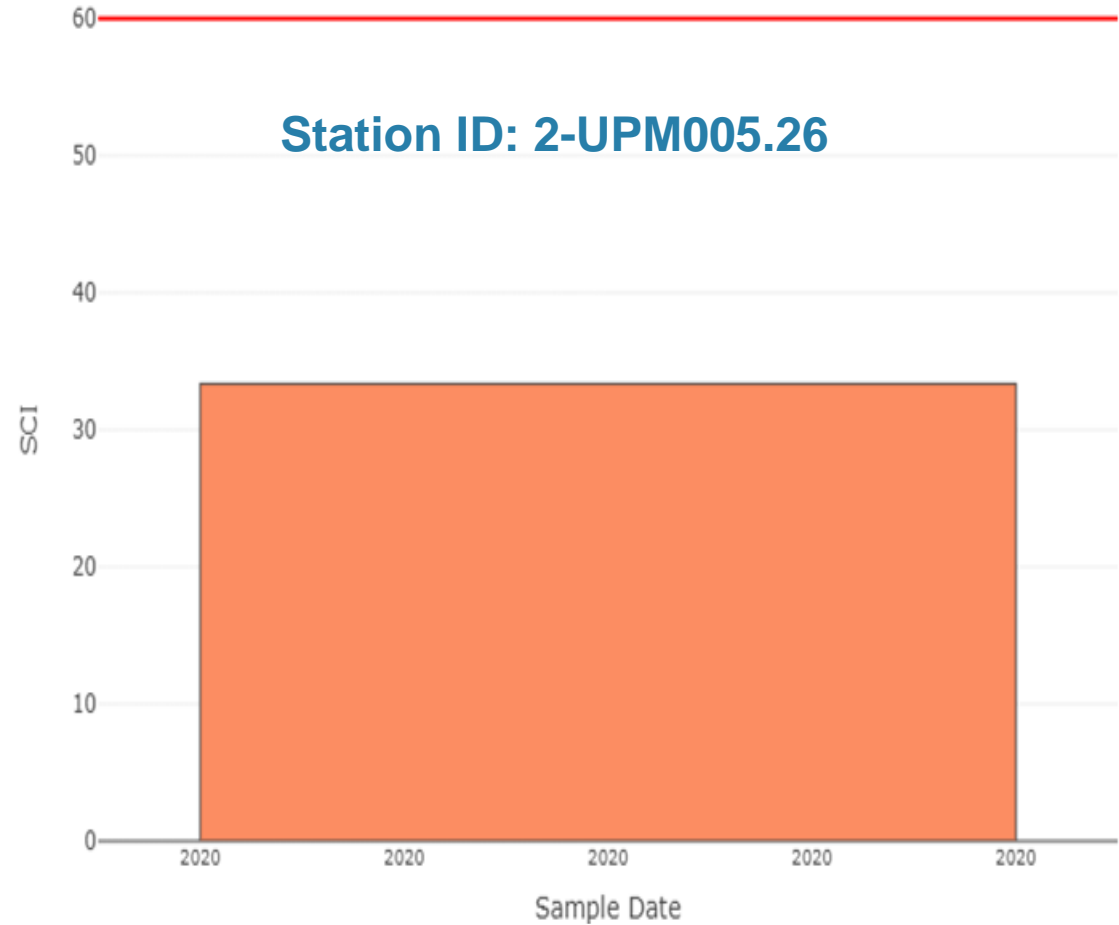
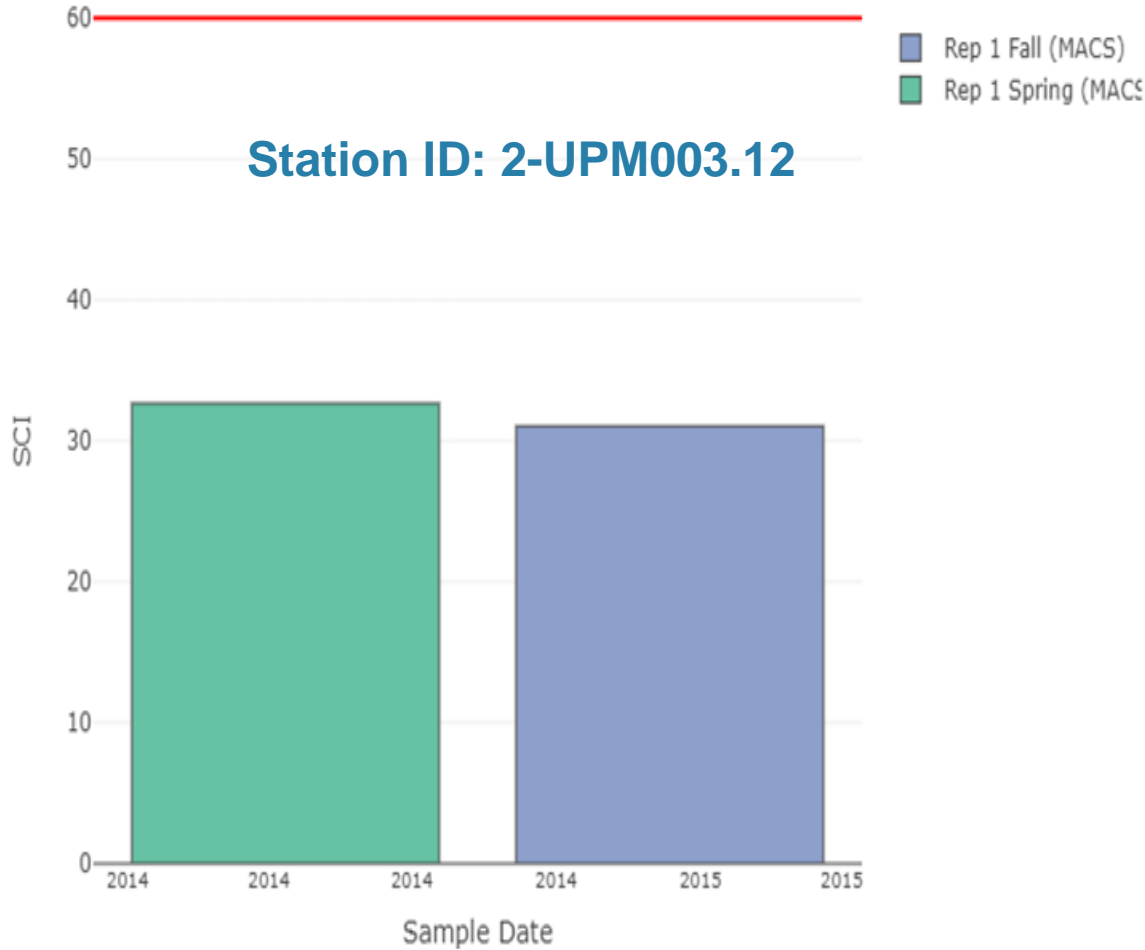
# Watershed III: Upham Brook

**Impairment: 12.15 mi**  
Headwaters to mouth



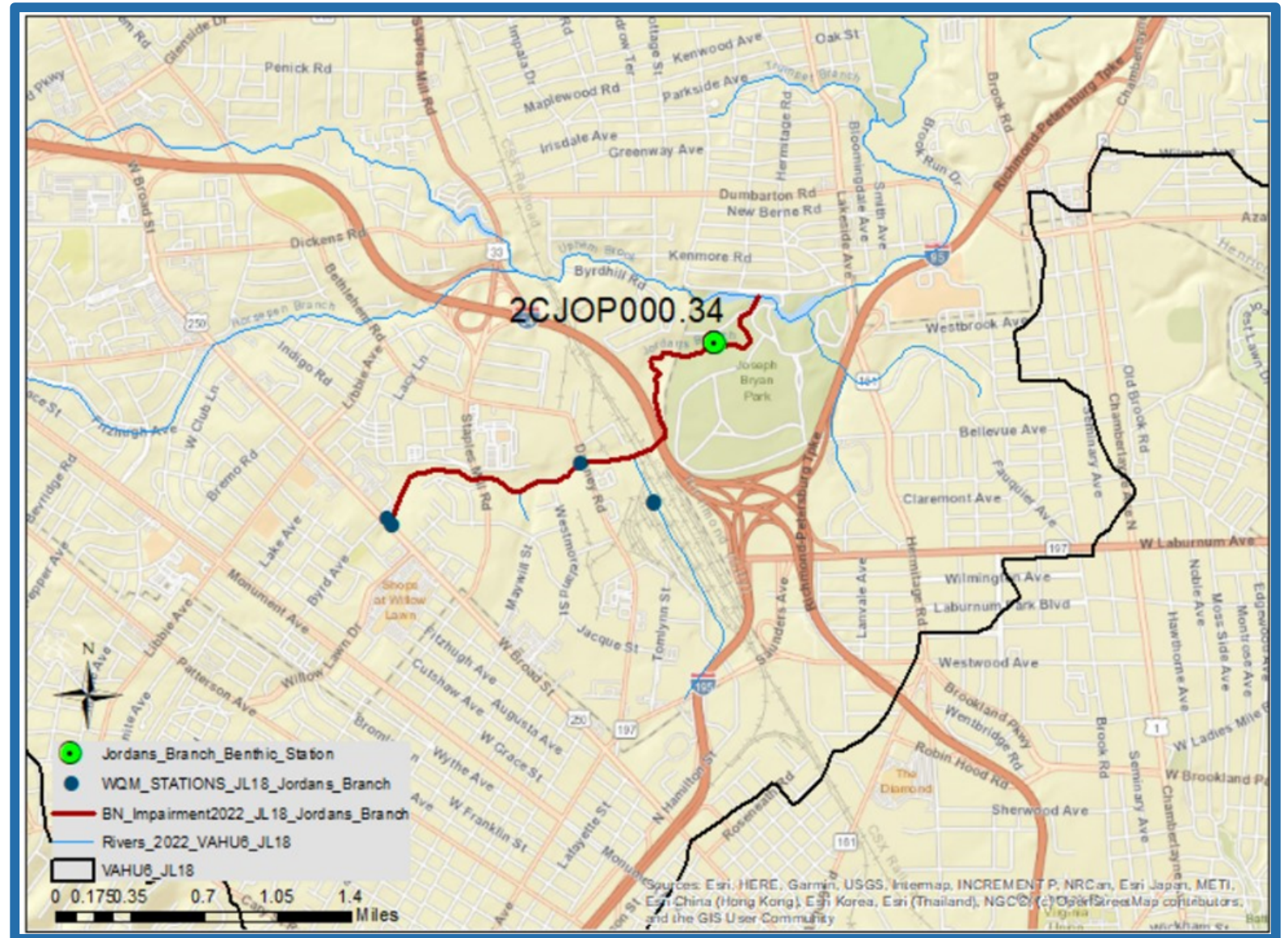


# Watershed III: Upham Brook VSCI Score



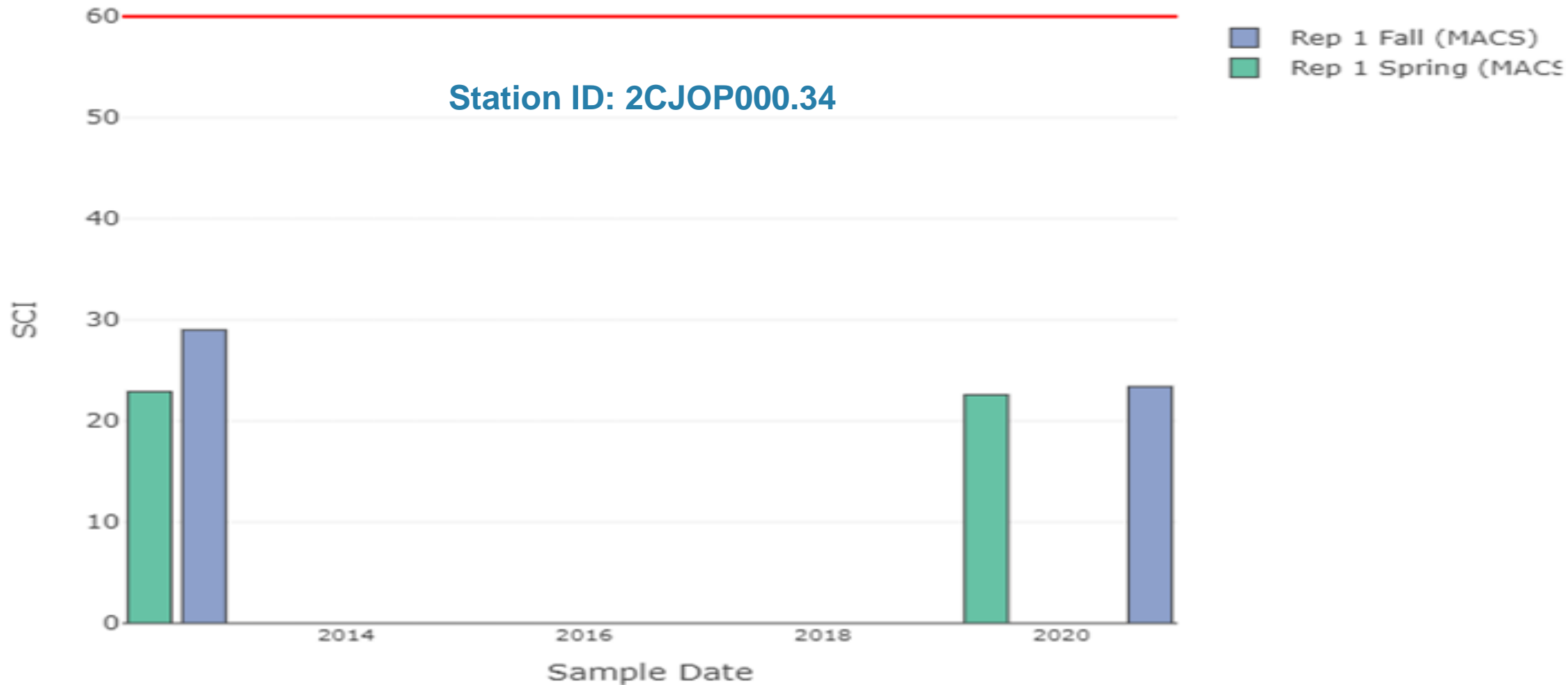
# Watershed III: Jordans Branch

**Impairment: 2.19 mi**  
Headwaters to mouth at  
Upham Brook





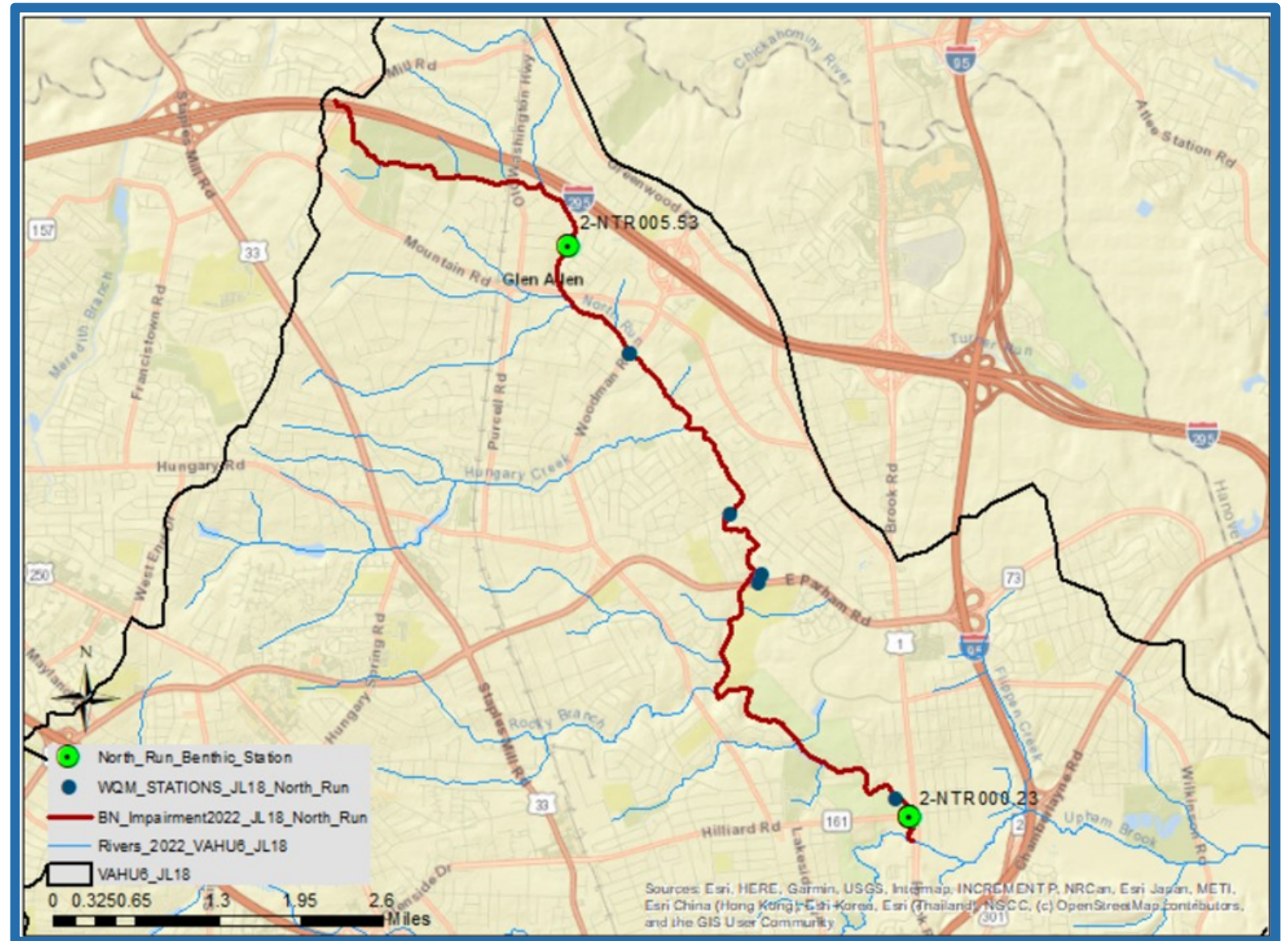
# Watershed III: Jordans Branch VSCI Score



# Watershed III: North Run

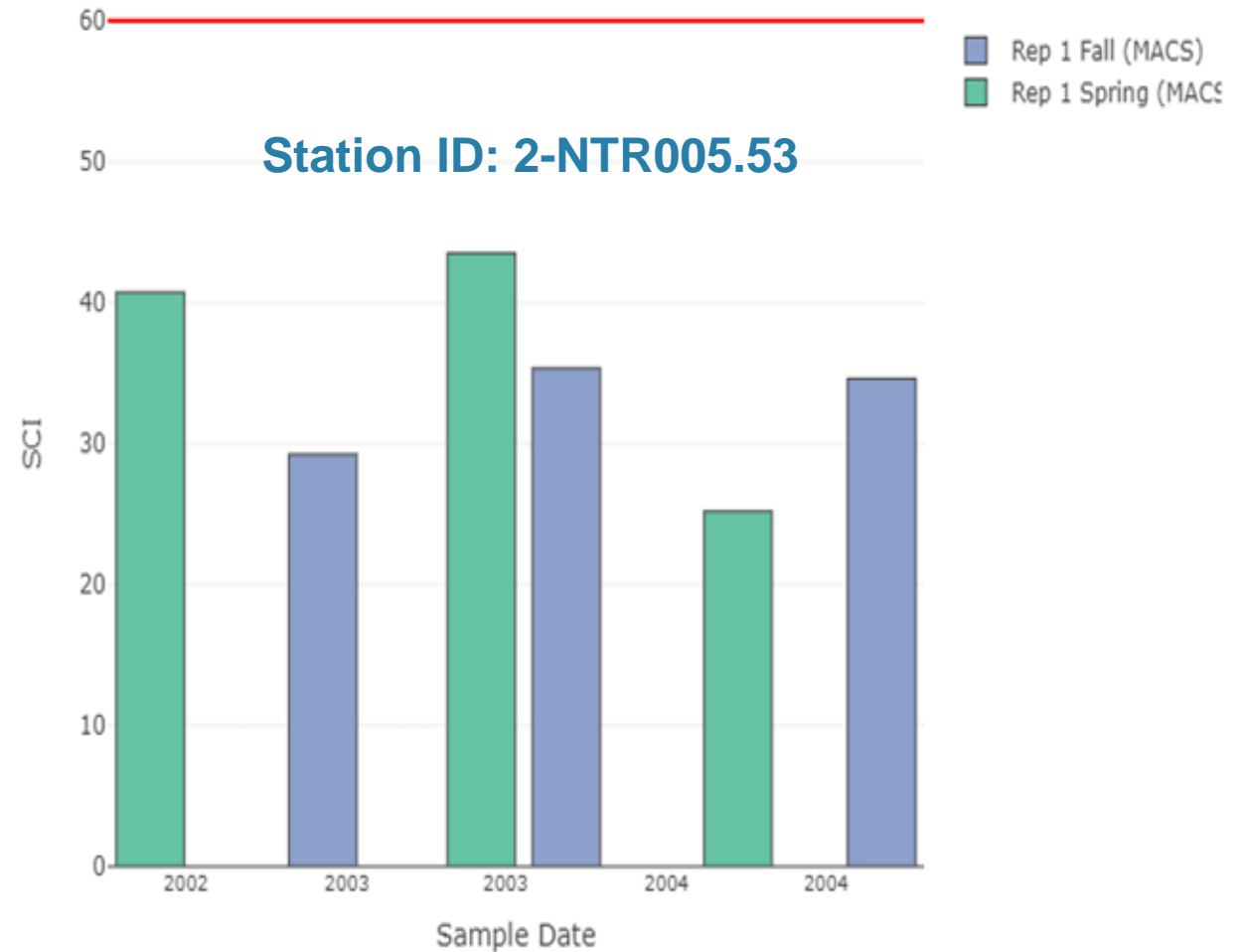
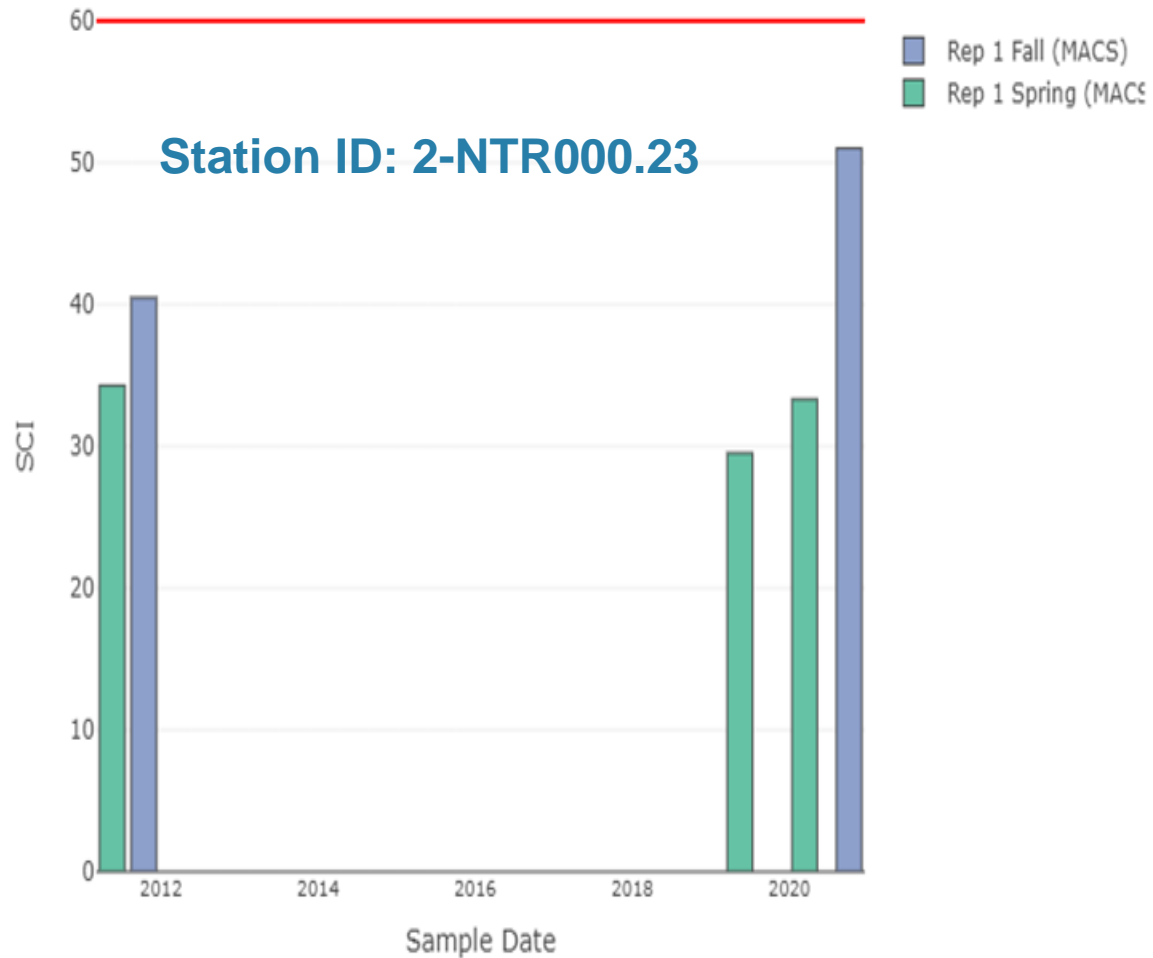
**Impairment: 7.9 mi**

From headwaters to its  
mouth at Upham Brook





# Watershed III: North Run VSCI Score





# Questions?



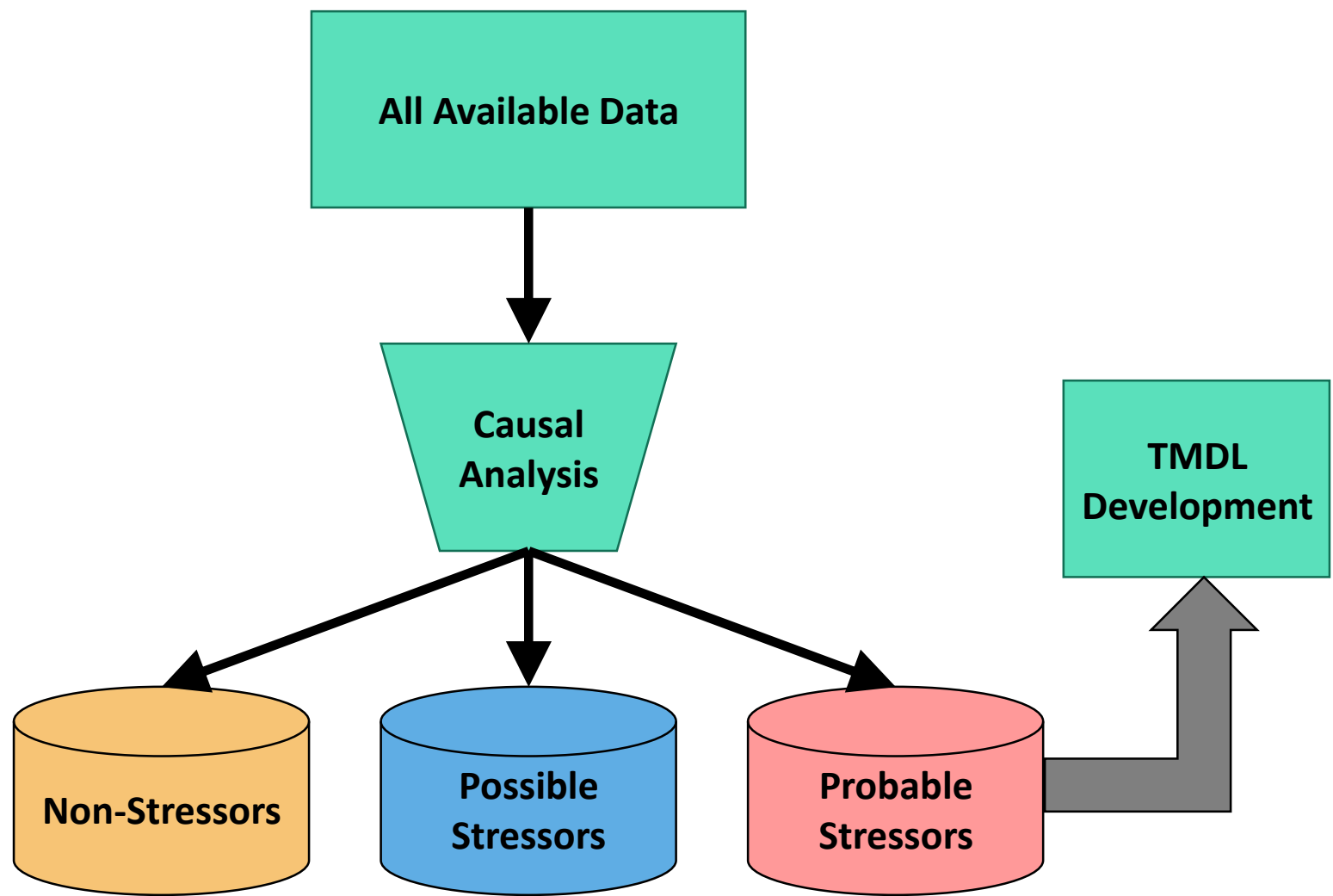


# **Part III:**

## **The TMDL Study**



# Stressor Analysis



Pollutants		
pH	Dissolved Sulfate	Ammonia
Dissolved Oxygen	Total Dissolved Ions	Dissolved Metals
Temperature	Suspended Solids	Sediment Toxics
Conductivity	Deposited Sediment	Sediment Metals
Dissolved Chloride	Organic Matter	Pesticides
Dissolved Sodium	Nitrogen	Polycyclic Aromatic Hydrocarbons (PAHs)
Dissolved Potassium	Phosphorus	Polychlorinated Biphenyls (PCBs)
Additional Contributing Factors		
Habitat	Hydrologic Alteration	Existing Dams and Impoundments
Natural low gradient	Current Land Use Practices	Anaerobic decomposition in connected wetlands



Sensitive to pollution: **Mayflies**



Moderately Sensitive: Dragonflies





# Insensitive to Pollution: Blackflies



# What is a TMDL?



**A Total Maximum Daily Load is the maximum amount of a pollutant that a waterbody can receive and still meet water quality standards.**



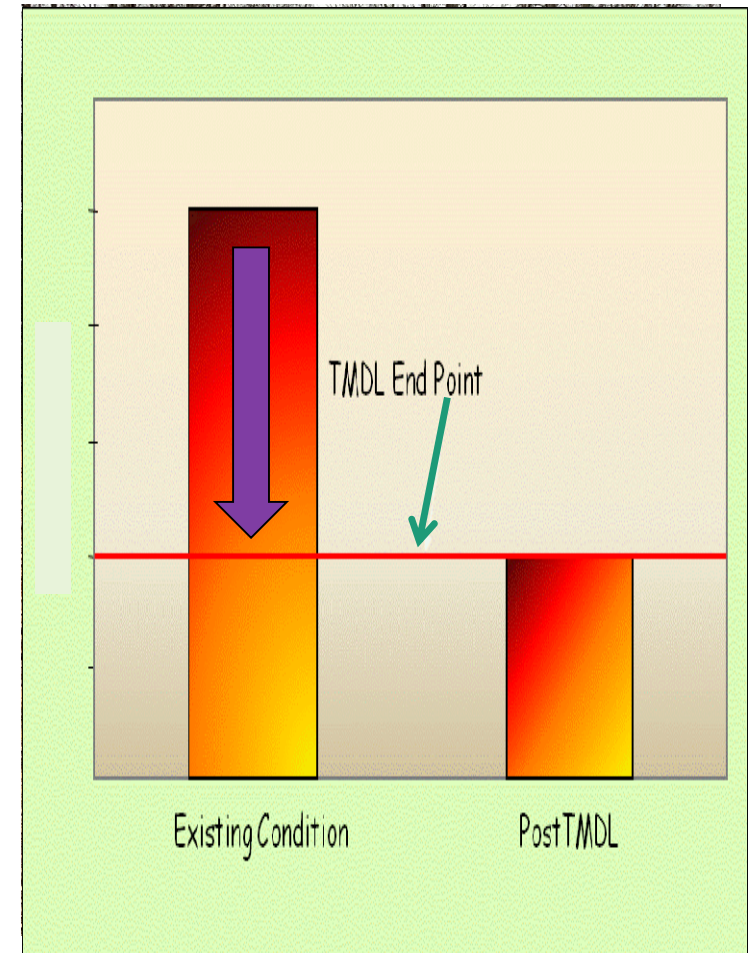
# TMDL = Sum of WLA + Sum of LA + MOS

Where:

TMDL = Total Maximum Daily Load  
WLA = Waste Load Allocation (point sources)  
LA = Load Allocation (nonpoint sources)  
MOS = Margin of Safety

Current Load = current loads discharged to the water body, which will be determined during this study

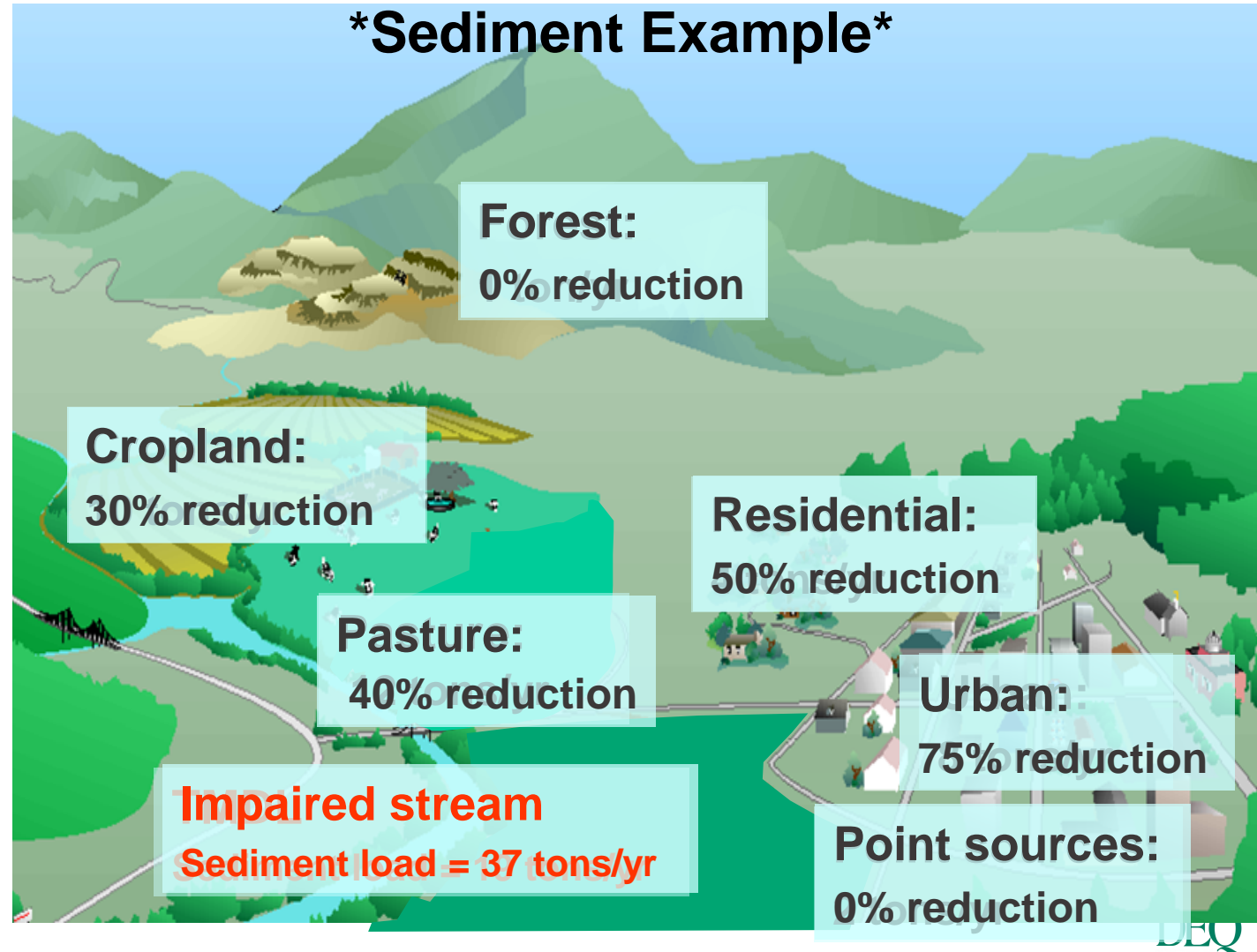
Reduction = (current load – TMDL) / current load x 100%



# TMDL Development: *What's the magic number...*

1. Identify sources of the pollutant
2. Model their path to the stream
3. Determine reductions needed from each source to meet standard

Diagram: Adapted from the Center for TMDL and Watershed Studies at Virginia Tech





# How can you get involved? Participate?



- Represent the local community
- Provide feedback on
  - Stressors to the benthic community
  - Land use
  - Pollutant sources
  - Community Engagement Meetings
- Join an Environmental Conservation Group
  - Help with river clean ups
  - Become a citizen monitor

# What's Next?

Join us for the next  
**Community Engagement Meeting!**

**Monday, July 10, 2023 (tentative)**  
**2:00 p.m. – 4:00 p.m.**  
**DEQ-PRO Office**





# Community Engagement Meeting or Technical Advisory Group?

## ✓ COMMUNITY ENGAGEMENT (CE) MEETINGS

- This is DEQ's typical meeting, no request needed
- Formerly known as TAC
- Open to the public & anyone in attendance can participate & advise DEQ on TMDL development

## ✓ TECHNICAL ADVISORY GROUP (TAG)

- Upon request during initial public comment period
- Instead of CE Meeting
- Formal panel with approved membership that advises DEQ on TMDL development
  - Cross-section of stakeholders
  - Members commit to attend multiple meetings
  - Non-members may attend only as observers



# Project Timeline

**Spring 2023**

- 1<sup>st</sup> public meeting (05/2)
- 1<sup>st</sup> CE Meeting (07/10 - tentative)
- Stressor Analysis Complete

**Fall 2023**

- 2<sup>nd</sup> CE Meeting (October)
- TMDL Development

**Winter 2024**

- 3<sup>rd</sup> CE Meeting (January)

**Summer 2024**

- Final Public Meeting (August)
- IP Begins



# Poll Question

**Question: Are you interested in participating in the Community Engagement Meetings for this project?**

**A. Yes.**

**B. No.**

**C. Maybe, notify me of meetings.**

Please send all comments in writing to  
[Denise.Moyer@deq.Virginia.gov](mailto:Denise.Moyer@deq.Virginia.gov)  
or 4949-A Cox Rd, Glen Allen, VA 23060

The 30 day public comment period will end on  
1 Jun 2023.

To learn more about TMDLs, visit DEQ's website:  
<https://www.deq.virginia.gov/water/water-quality/tmdl-development/tmdls-under-development>



# Questions?





