



Greendale Creek and Unnamed Tributary to Fleenor Branch Clean Up Study Initial Public Meeting

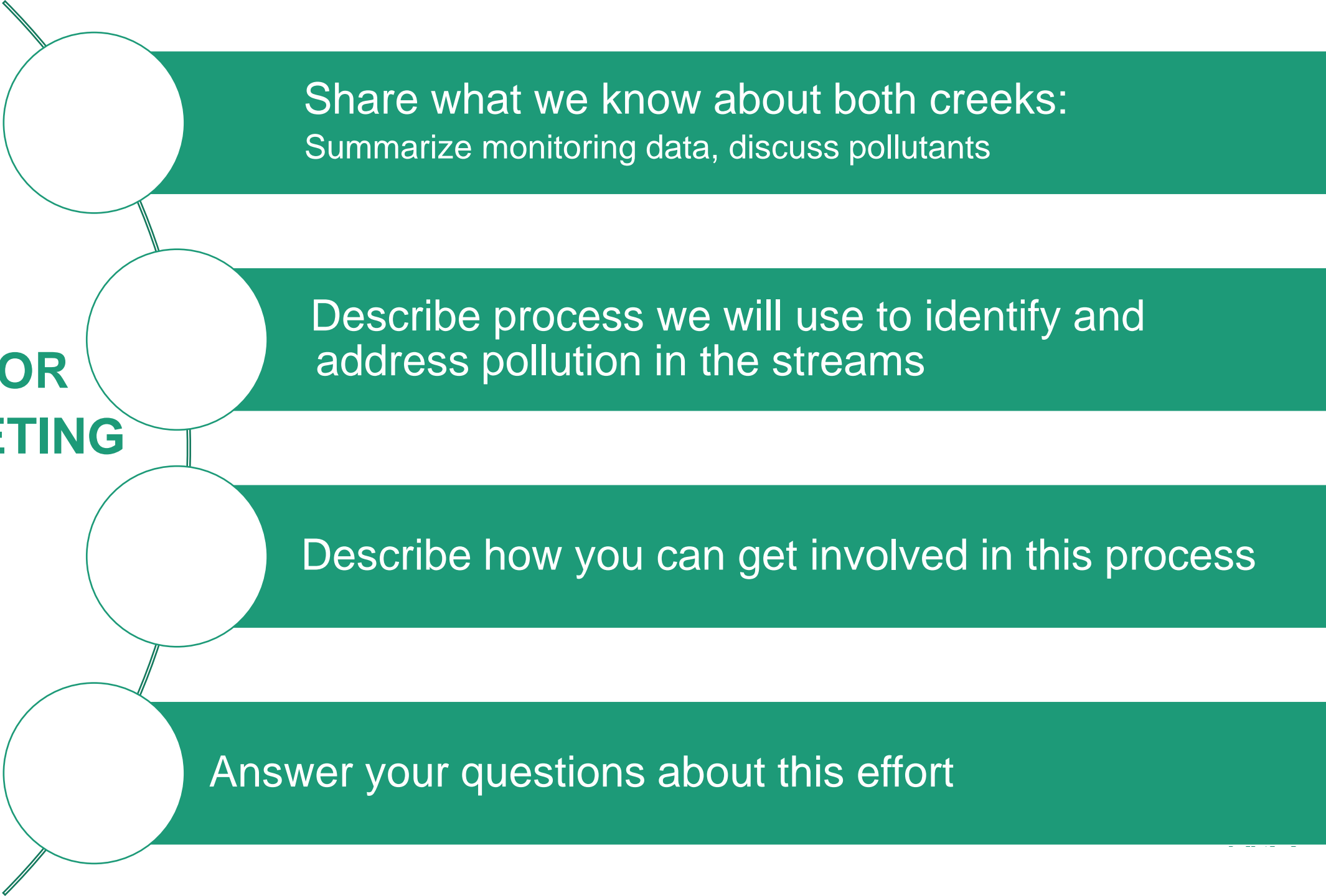
Landon Jenkins

TMDL Coordinator, SWRO Regional Office
Virginia Department of Environmental Quality

April 2, 2024



GOALS FOR OUR MEETING



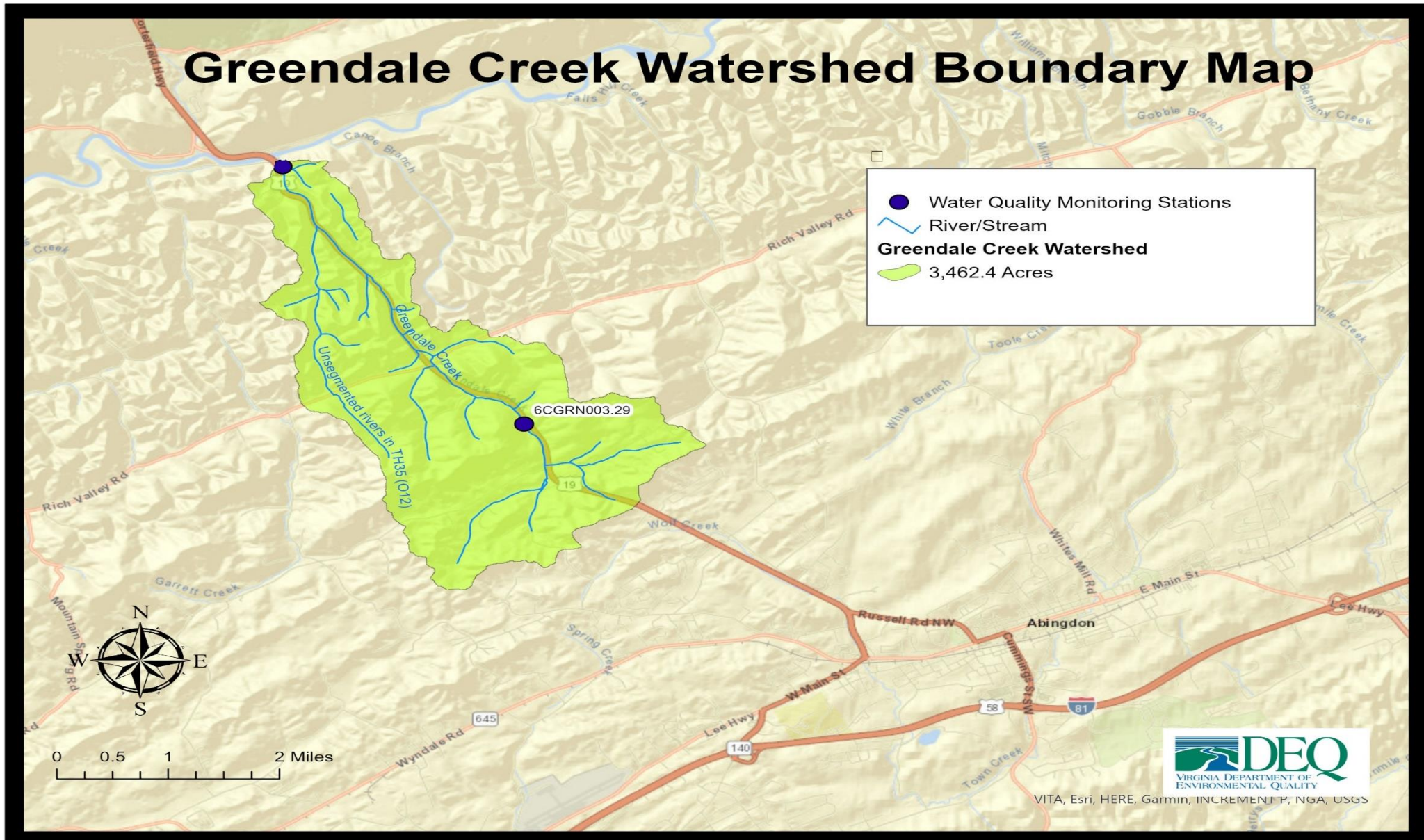
Share what we know about both creeks:
Summarize monitoring data, discuss pollutants

Describe process we will use to identify and
address pollution in the streams

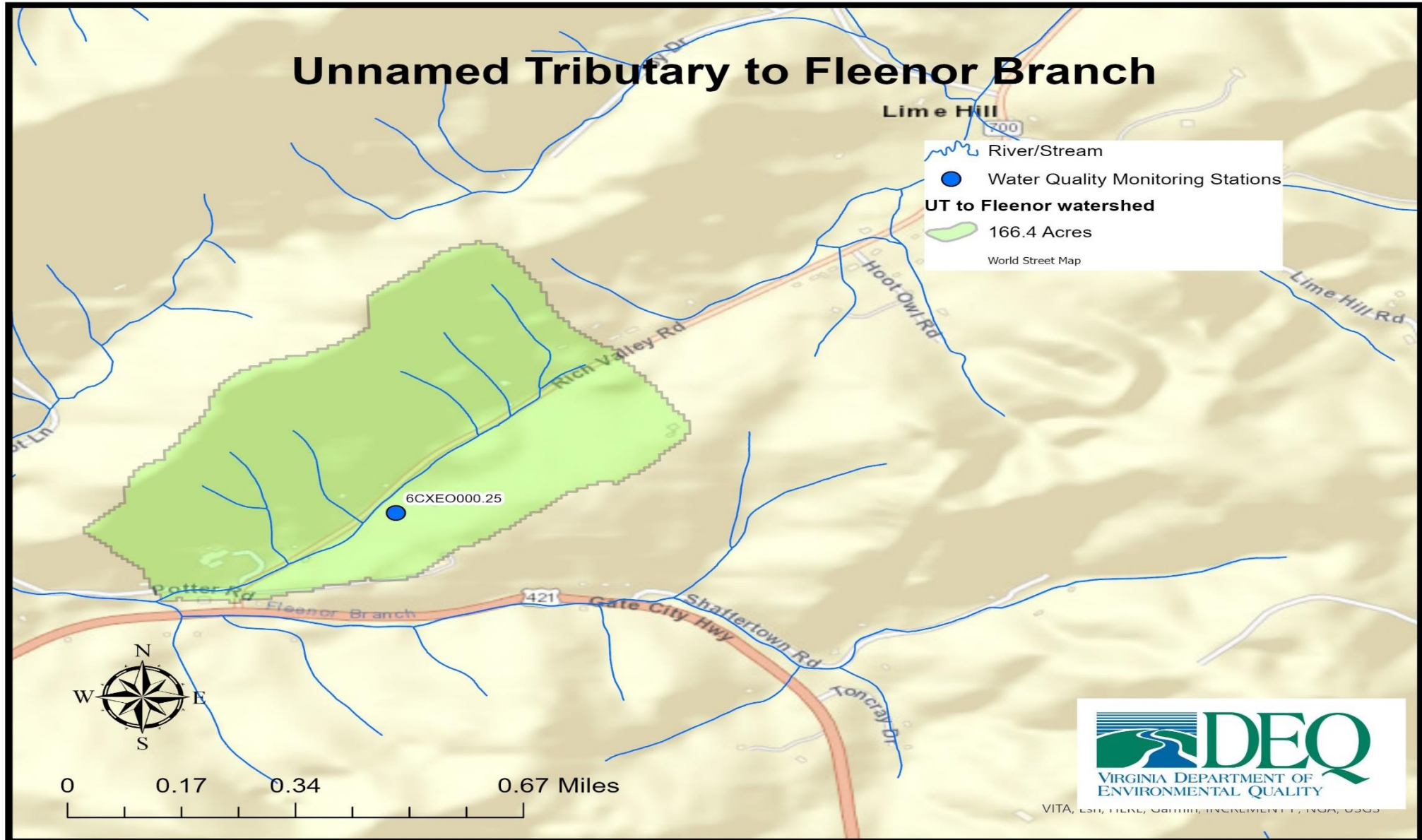
Describe how you can get involved in this process

Answer your questions about this effort

Greendale Creek Watershed Boundary Map



Unnamed Tributary to Fleenor Branch



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 harmful to aquatic life
- Monitor benthic macroinvertebrates (the bugs on the stream bottom) to determine if the standard is met



Why should we care about bugs?

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



Determining a biological impairment

- DEQ biological monitoring data (spring and fall)
- VA Stream Condition Index is our barometer
 - Diversity, pollution tolerance, feeding group
 - Target score of ≥ 60



Sensitive to pollution: **Mayflies**



Sensitive to pollution: Caddisflies



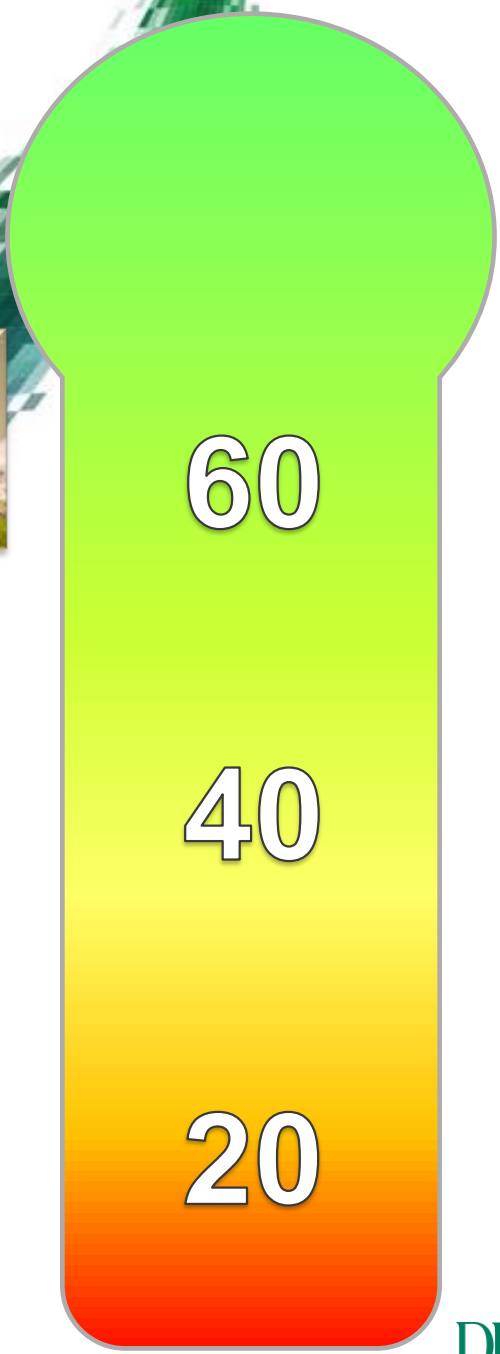
Moderately Sensitive: Dragonflies



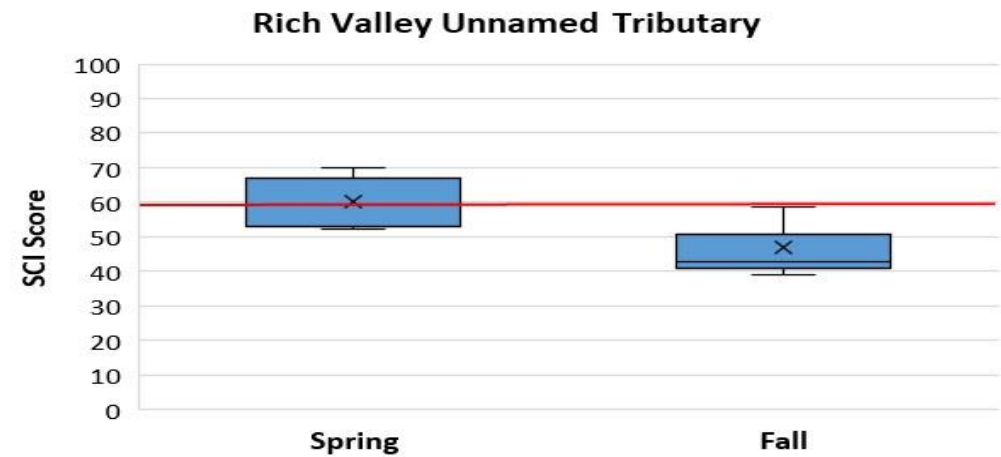
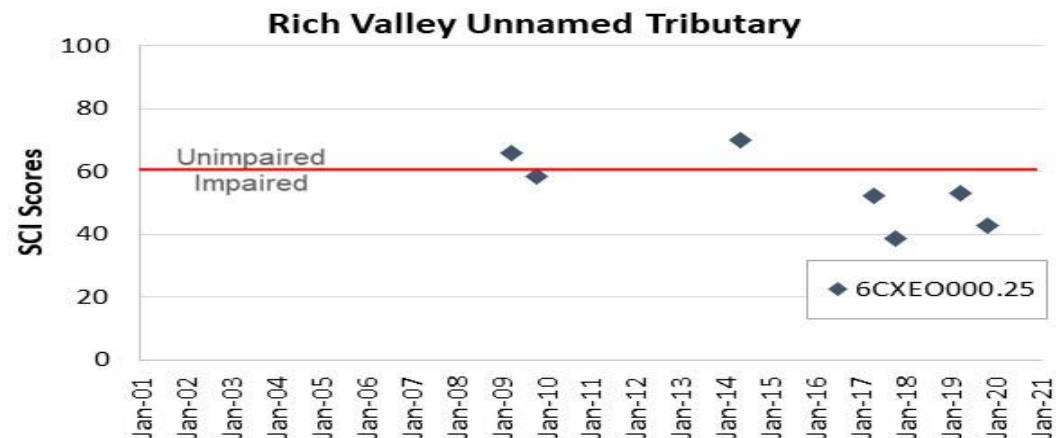
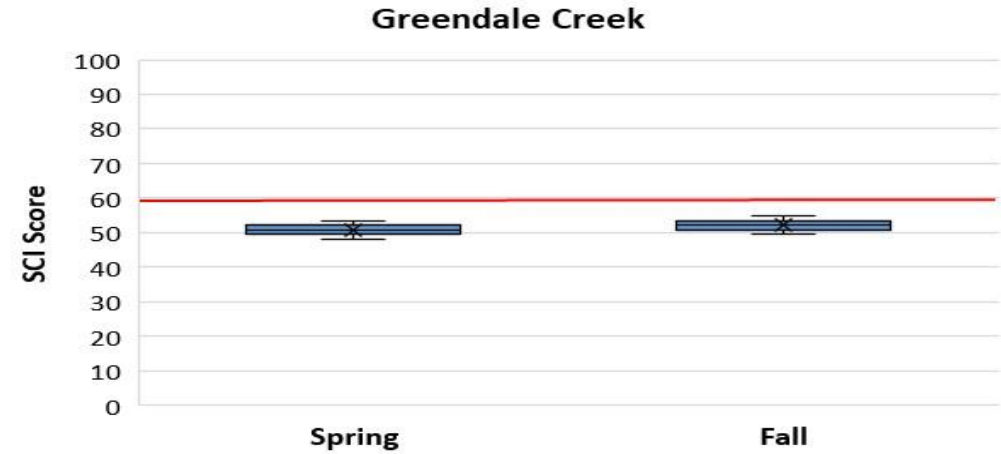
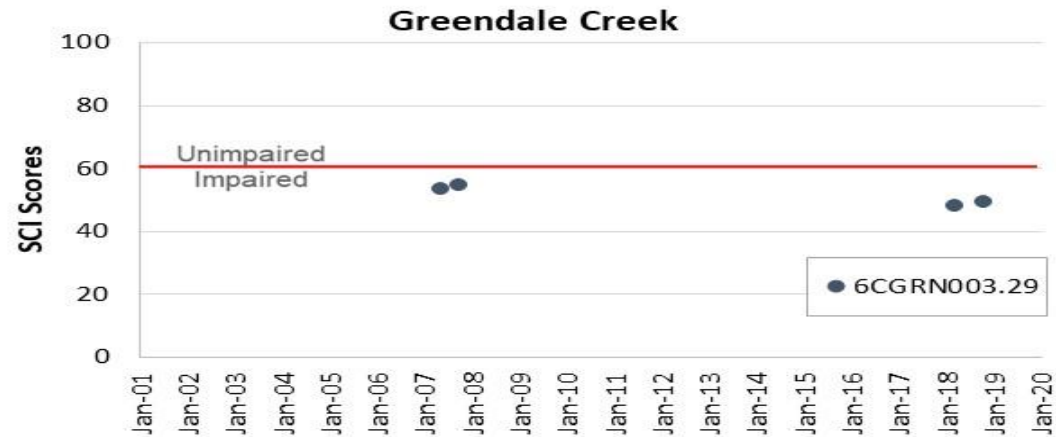
Insenstive to Pollution: **Blackflies**



Virginia Stream Condition Index



Temporal trends in benthic data for Greendale Creek and Unnamed Tributary to Fleenor Branch



Biological Impairments Determining the Cause...

- Benthic stressor analysis
 - Evaluation of monitoring data
 - Comparison with healthy reference watershed data and stressor thresholds
 - Weight of evidence approach
 - Identification of most likely stressor(s)

Candidate Stressors

- Suspended solids
- Deposited sediment
- Dissolved oxygen
- Phosphorus
- Nitrogen
- Ammonia
- Total dissolved ions
- Dissolved chloride
- Dissolved sulfate
- Dissolved sodium
- Dissolved potassium
- Dissolved metals
- Temperature
- Conductivity
- pH
- Organic matter
- Sediment metals
- Sediment toxics
- Pesticides
- Polycyclic Aromatic Hydrocarbons (PAHs)
- Polychlorinated Biphenyls (PCBs)

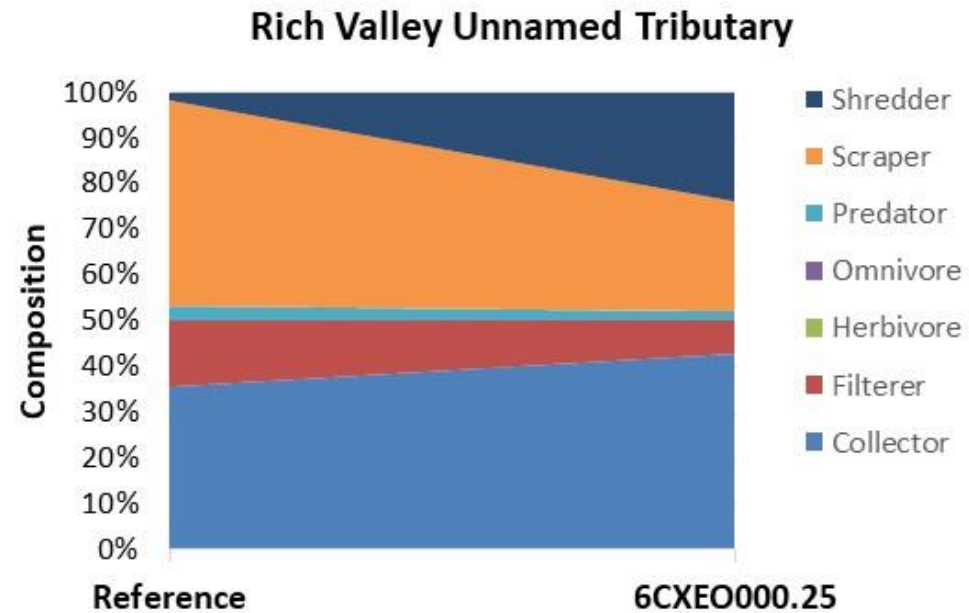
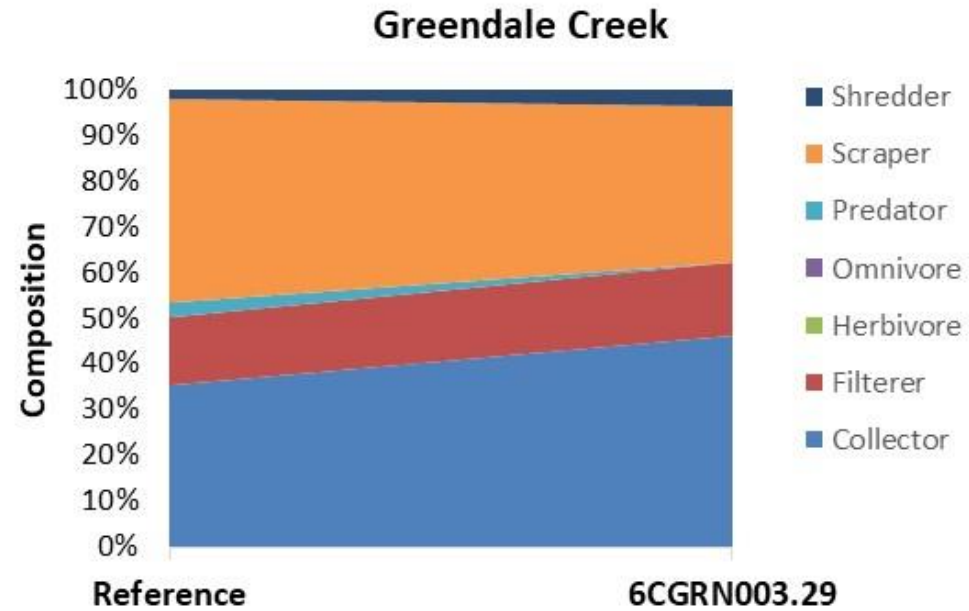
Weighing the Evidence: *Sediment example*

Eroding
streambanks
Sediment
deposits
Highly
embedded

Intact
streamside
buffers



Evidence of Sediment as a Stressor Increase of Collectors



Net spinning caddisfly



More evidence for sediment? Habitat Assessment Scores

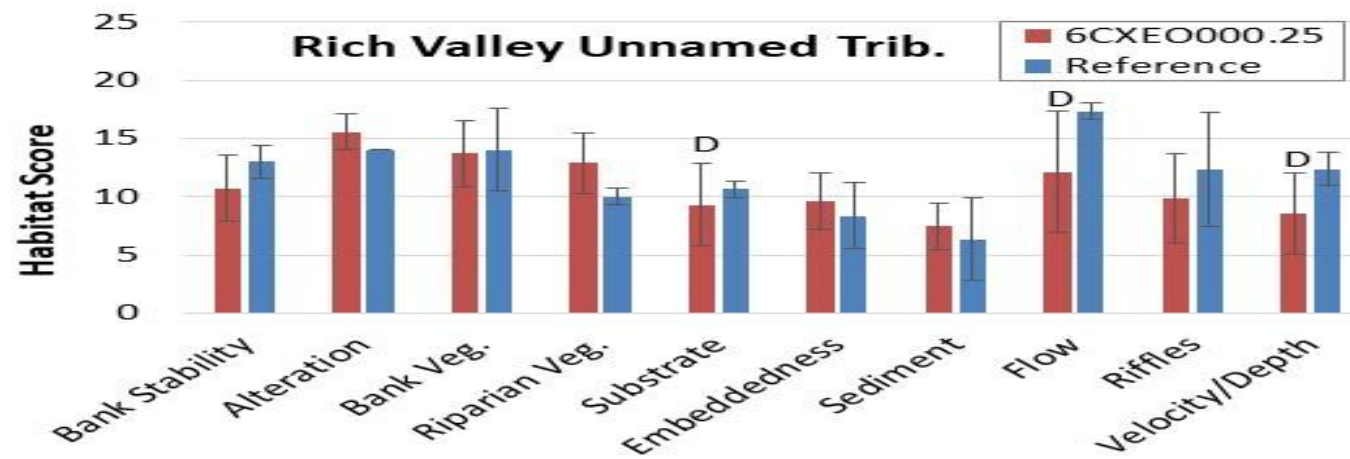
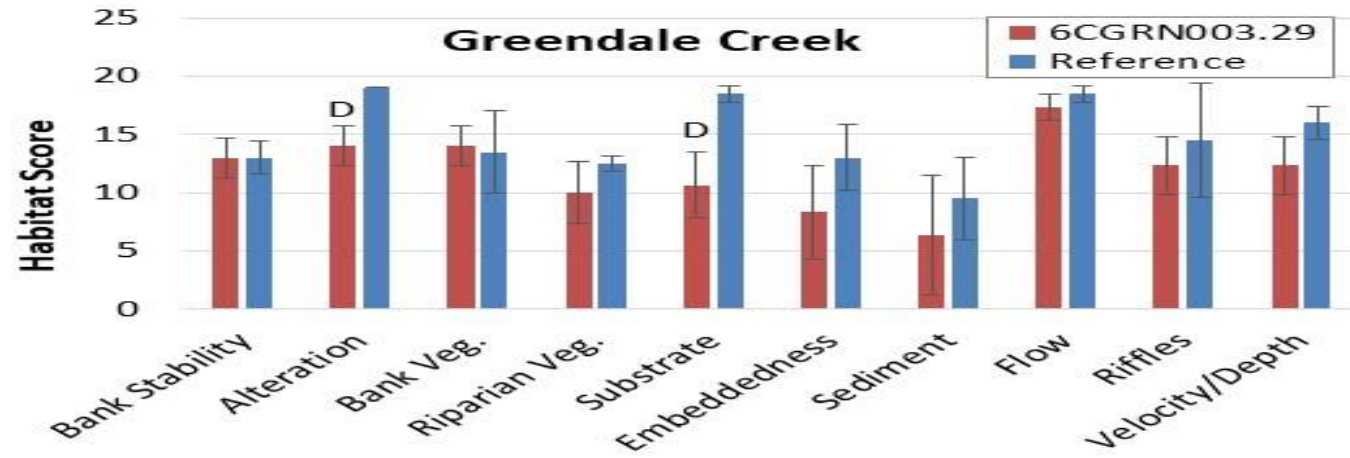
Greendale Creek

- Chanel Alteration and Chanel Substrate scored low. These lower metric scores represent both sediment sources from degraded bank habitat and indications of deposited sediment impacts within the stream channel.

Unnamed Tributary to Fleenor Branch

- In Unnamed Tributary to Fleenor Branch, habitat metrics for substrate, flow, and velocity/depth were significantly scored low. Rich Valley Unnamed Tributary is a very small stream, and flow conditions may decrease dissolved oxygen and limit ecological health during dry periods.

Habitat measurements



What is a TMDL?



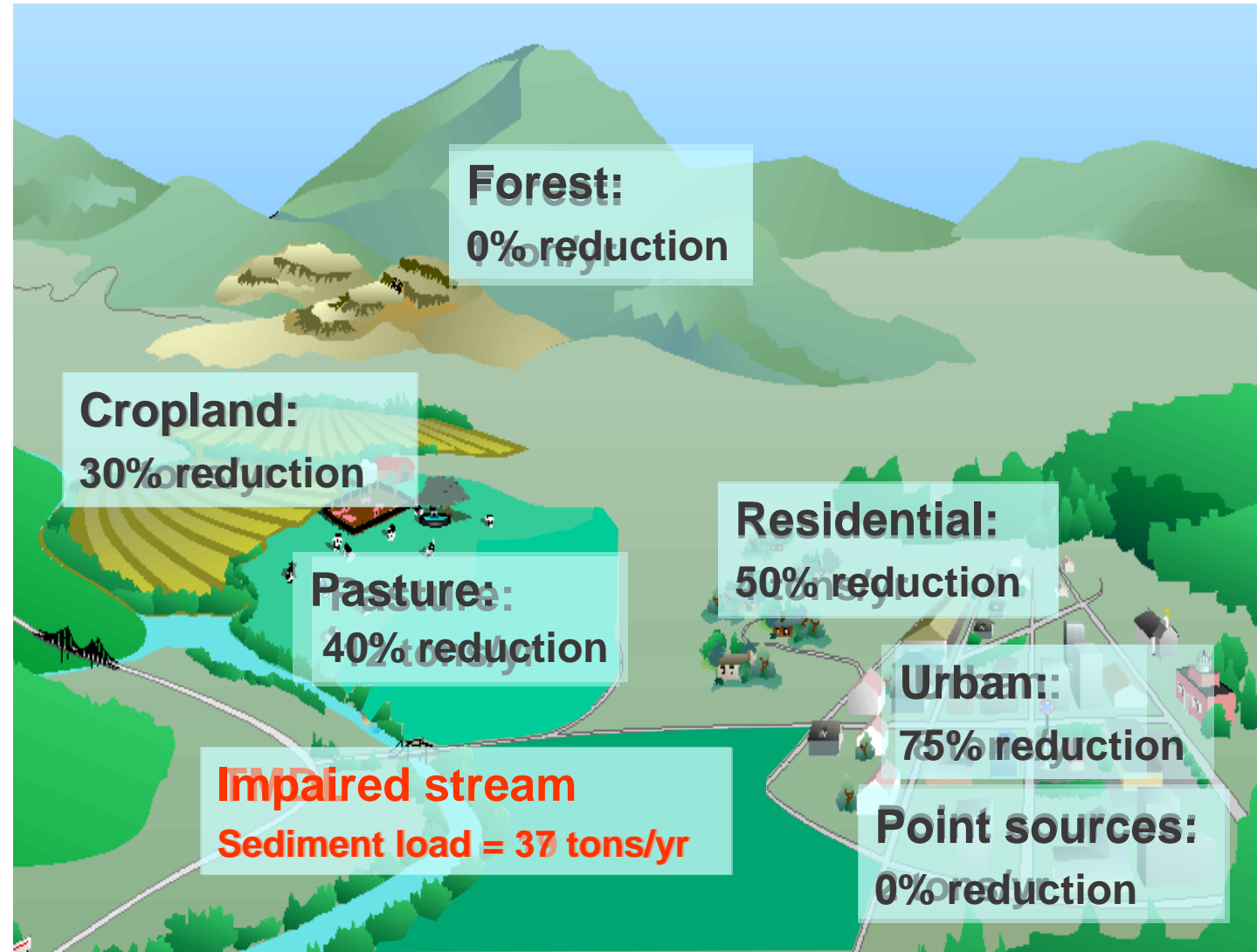
A Total Maximum Daily Load is the maximum amount of a pollutant that a waterbody can receive and still meet water quality standards.

How do we develop a TMDL?

What's the magic number...

1. Identify sources of sediment and phosphorus
2. Model their path to the stream
3. Determine reductions needed from each source to restore aquatic life

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



More than just a number?

- Primary objective is to address pollution in our waterways
- TMDL study is the first step
- Followed by an implementation plan
- Implementation through partnerships with local organizations



Photo: Jan Hamsky; www.lifeinfreshwater.net

How can you get involved?

We need to hear from you!!!

- Participate in Community Engagement Meetings
 - Represents the local community
 - Provides feedback on
 - Land use
 - Pollutant sources
 - Key stakeholders and community meetings



What's Next?

Join us for the first
Community Engagement
Meeting!

Mid-Late May
Time Preference???
Location Preference???



Questions & Comments

**30-day public comment period
(April 2 – May 2, 2024)**

Send comments to:

Landon Jenkins

355 A Deadmore St SW

Abingdon, VA 24210

landon.jenkins@deq.virginia.gov

