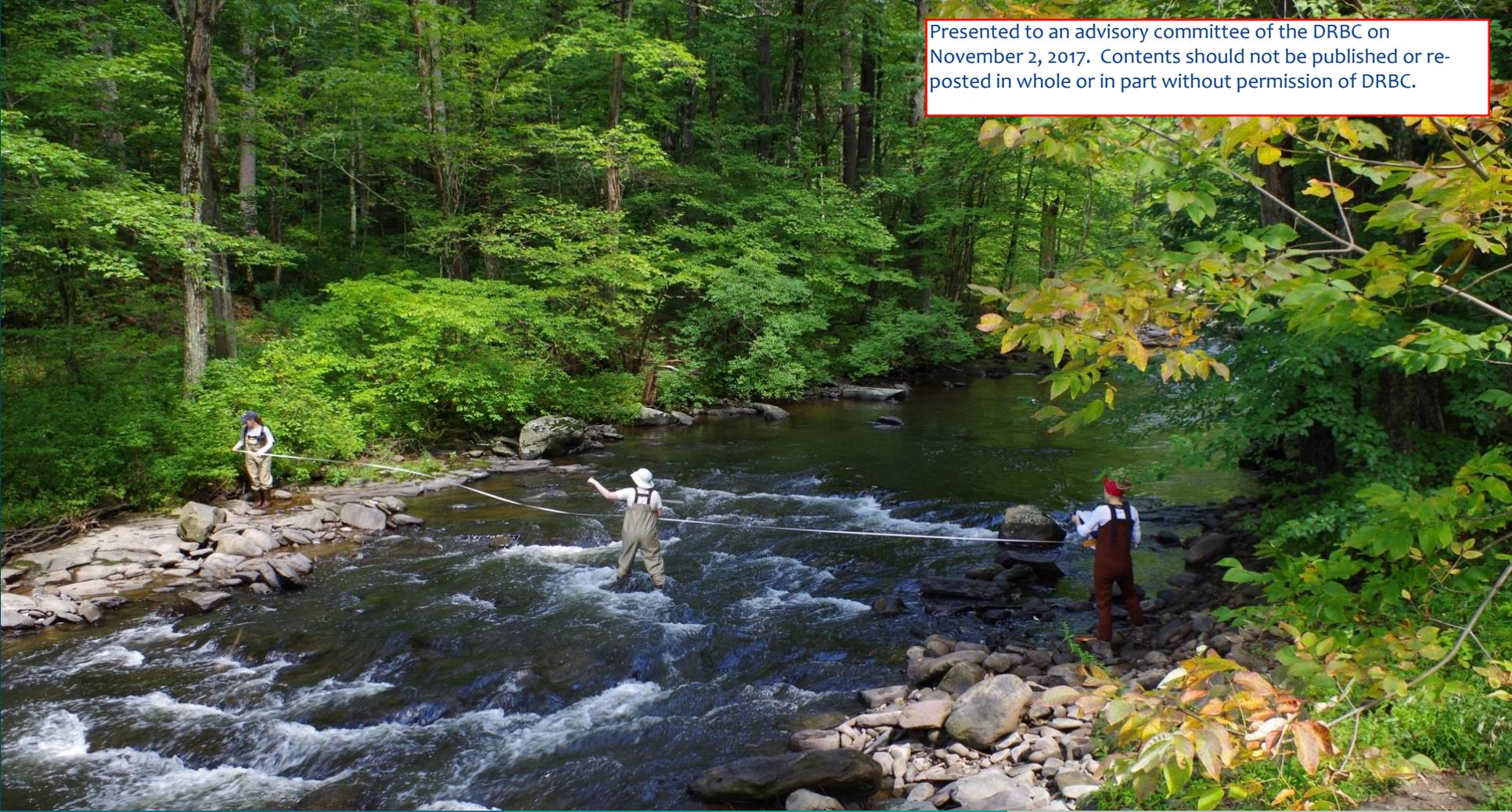


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## Delaware River Watershed Initiative - Monitoring & Data Activities -

Dr. Marie J. Kurz

2 Nov 2017



The Academy of  
Natural Sciences  
of DREXEL UNIVERSITY

# Delaware River Watershed Initiative

Goal: “Watersheds that provide high quality water in sufficient quantity to support healthy natural and human communities”

- Align conservation efforts of 50+ partner organizations
- Focused on *local* impact & *science-driven* conservation.
- Restore degraded areas & Protect critical landscapes
- Monitor water quality & ecosystem impacts.
- Synthesize basin-wide data, evaluate & adapt.

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# Monitoring Objectives

## 1. Characterize baseline conditions

- Spatial & temporal variation across DRW
- “Before” project information

## 2. Predict & track change

- Chemical loading & assemblage composition/types
- Metric values from IBIs & chemistry

## 3. Connect to theories:

- Nutrient reduction → stream ecosystem integrity
- Response to single or suite of agricultural BMPs and land preservation
- Lag effects



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# Working Scales

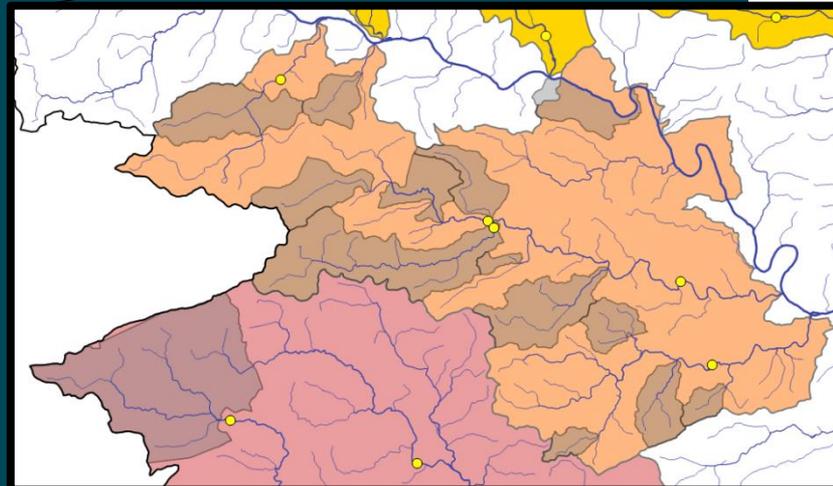
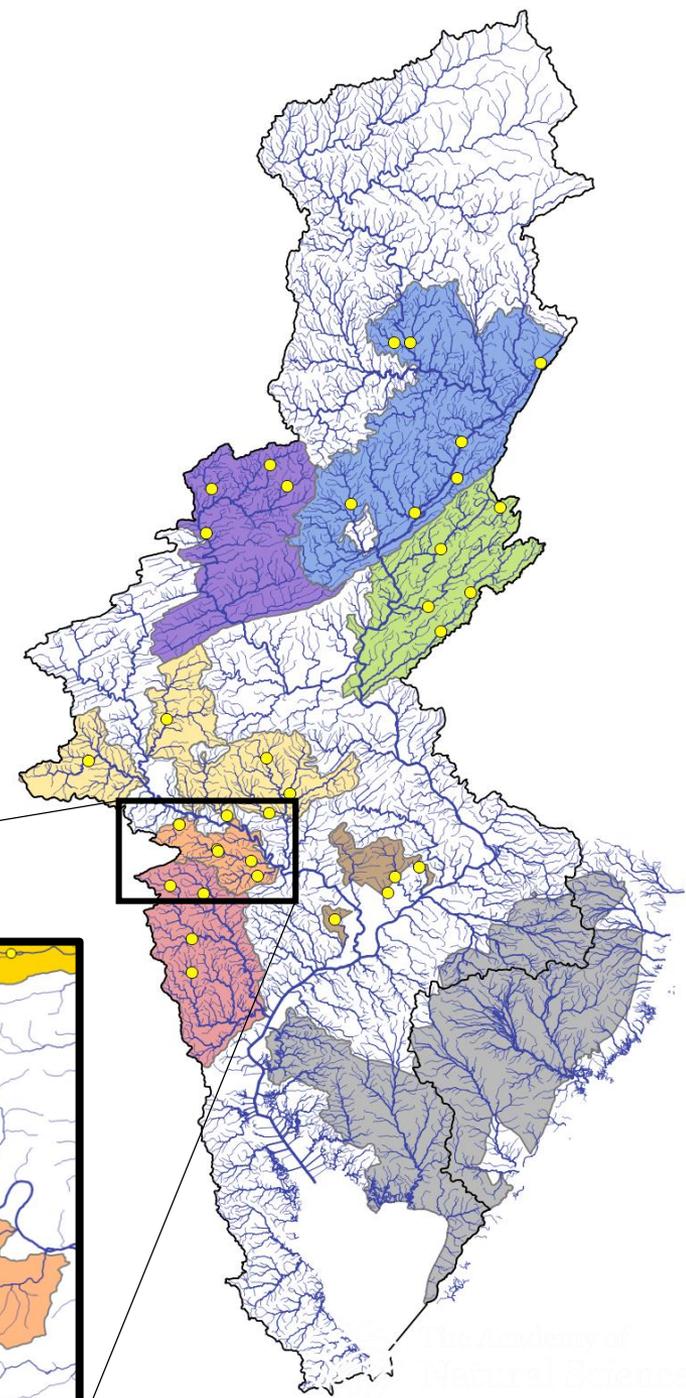
## 8 sub-watershed “clusters”

- ~ 1/4 of the Delaware Basin
- Ecological significant
- Continuum of catchment landscapes and of stressor impacts

## Cluster “Focus Areas”

- Focus conservation efforts
- Scale for *measurable* change

## Project sites



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# Sampling Design

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## Macroinvertebrates

- Aquatic insects generally identified to species or genus.
- Non-insects identified to higher taxonomic levels (e.g. order, family).



## Fish

- Fish over 25mm identified to species. Dimensions, condition & markings noted.
- Salamanders/amphibians & crayfish sometimes sampled.



## Soft-bodied algae & Diatoms

- In-field algae cover & algae diversity (presence)
- Algae & diatom samples identified to lowest possible taxonomic level
- Substrate chlorophyll-a concentrations



## Habitat characteristics

- Depth, wetted & bank-full widths, canopy cover, % in-stream cover, etc.

## Chemistry

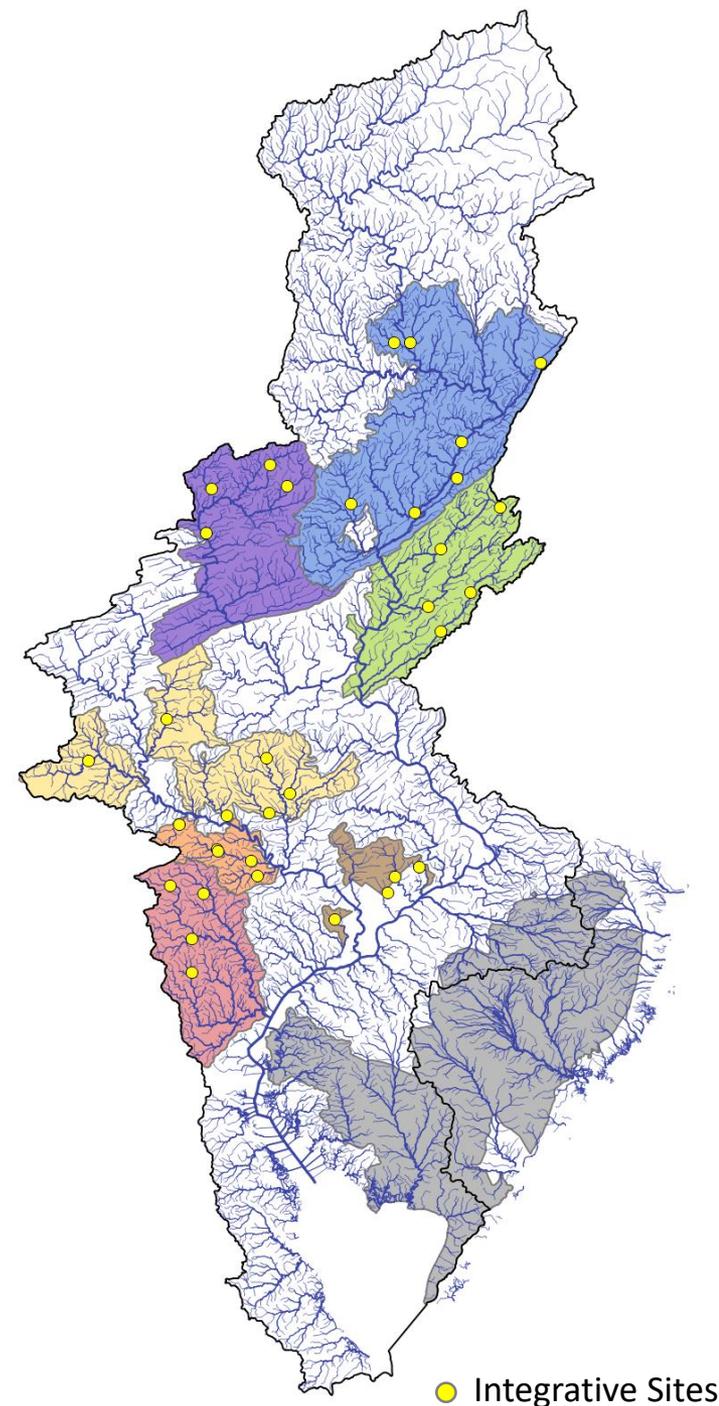
- Field parameters (T, pH, DO, SpC, alkalinity); Nutrients (TN, NO<sub>3</sub>, NH<sub>4</sub>, TKN, TP & SRP); TSS; Major ions & metals (Cl, SO<sub>4</sub>, Br, Ca, Na, Mg, K, Fe, Mn, Ba, Sr)

# Sampling Design

## 35 “Integrative” Sites

- Monitored since 2013
- Biological Indicators:
  - Macroinvertebrates (spring)
  - Fish (summer/fall)
  - Algae/Diatoms (summer)
- Habitat characteristics (summer)
- Chemistry (seasonally)

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# Sampling Design

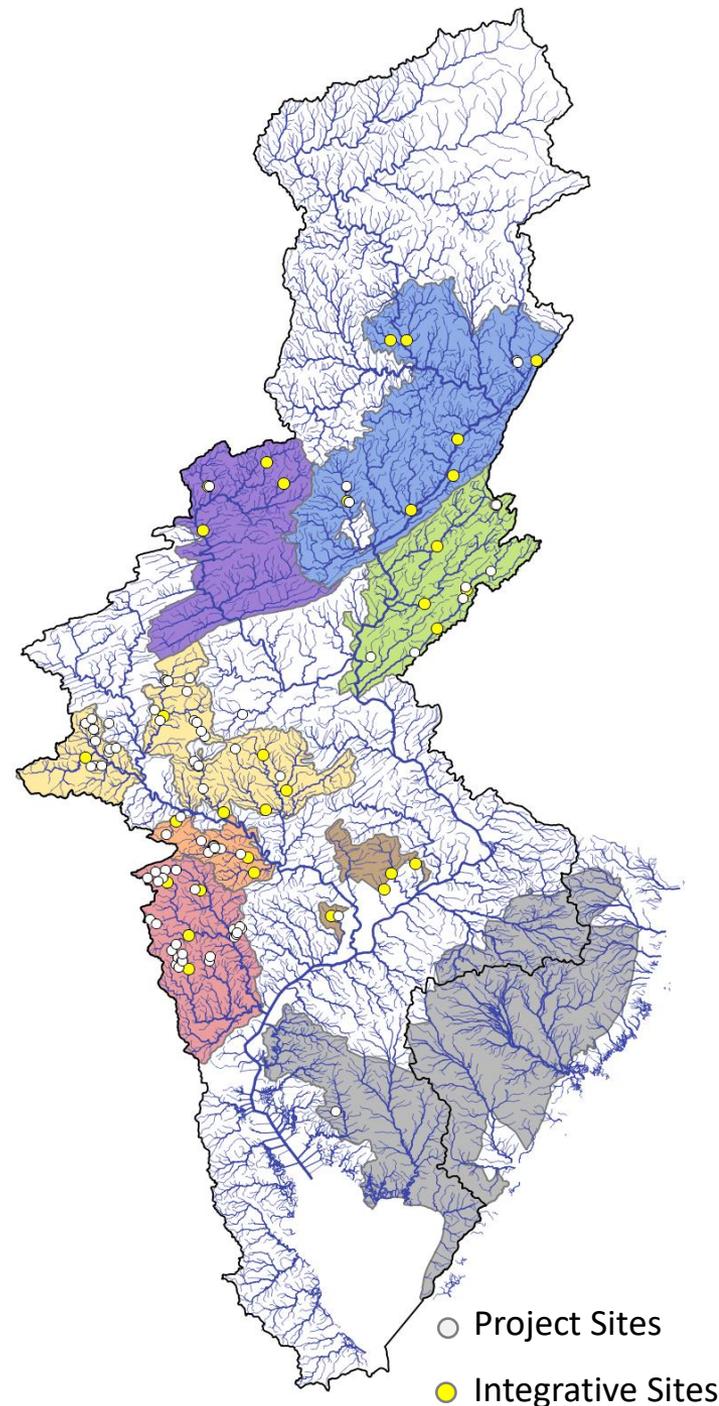
77+ Project impact sites\*

- Biological Indicators:
  - Macroinvertebrates (before/after)
  - Fish (~before/after)
  - Algae/Diatoms (before/after)
- Habitat characteristics (before/after)
- Chemistry (before/after)

\*Future sites: fewer by more intensive.

Initiative-wide data access plan pending  
(HydroShare)

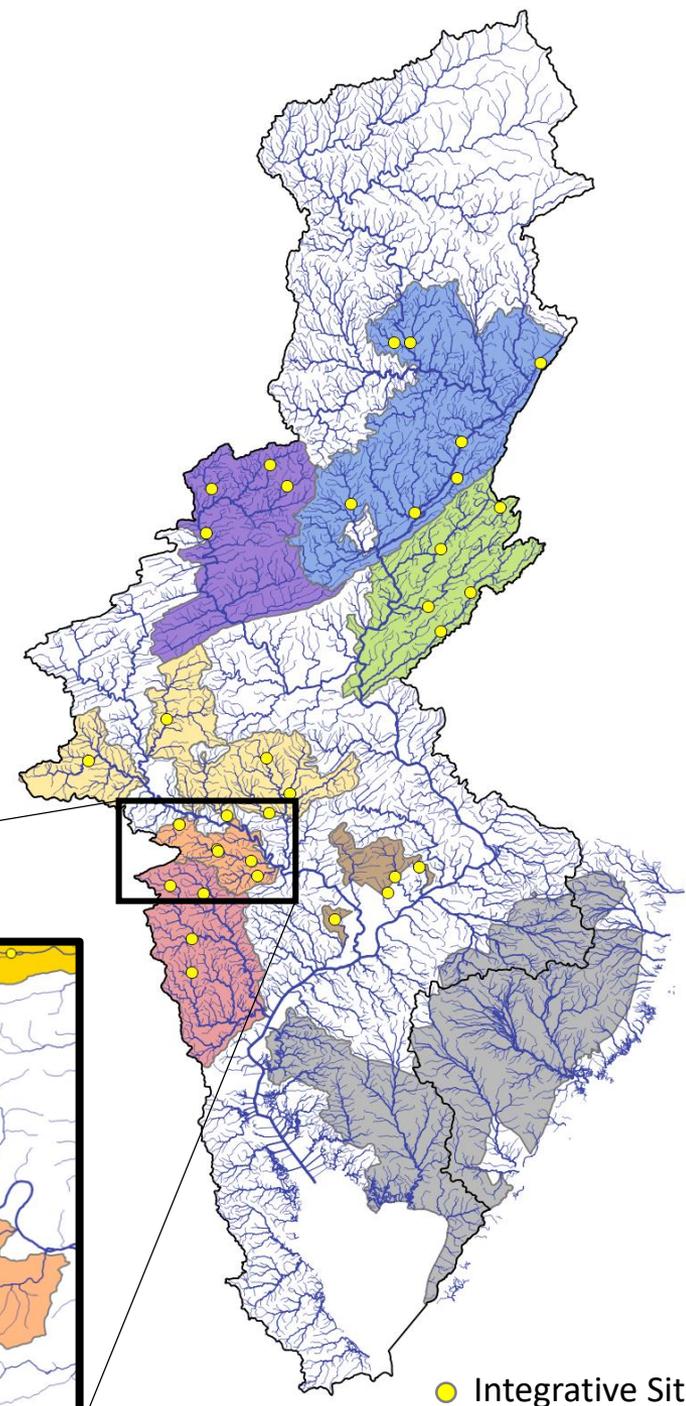
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# Sampling Design

## Focus Area characterization sites (# TBD)

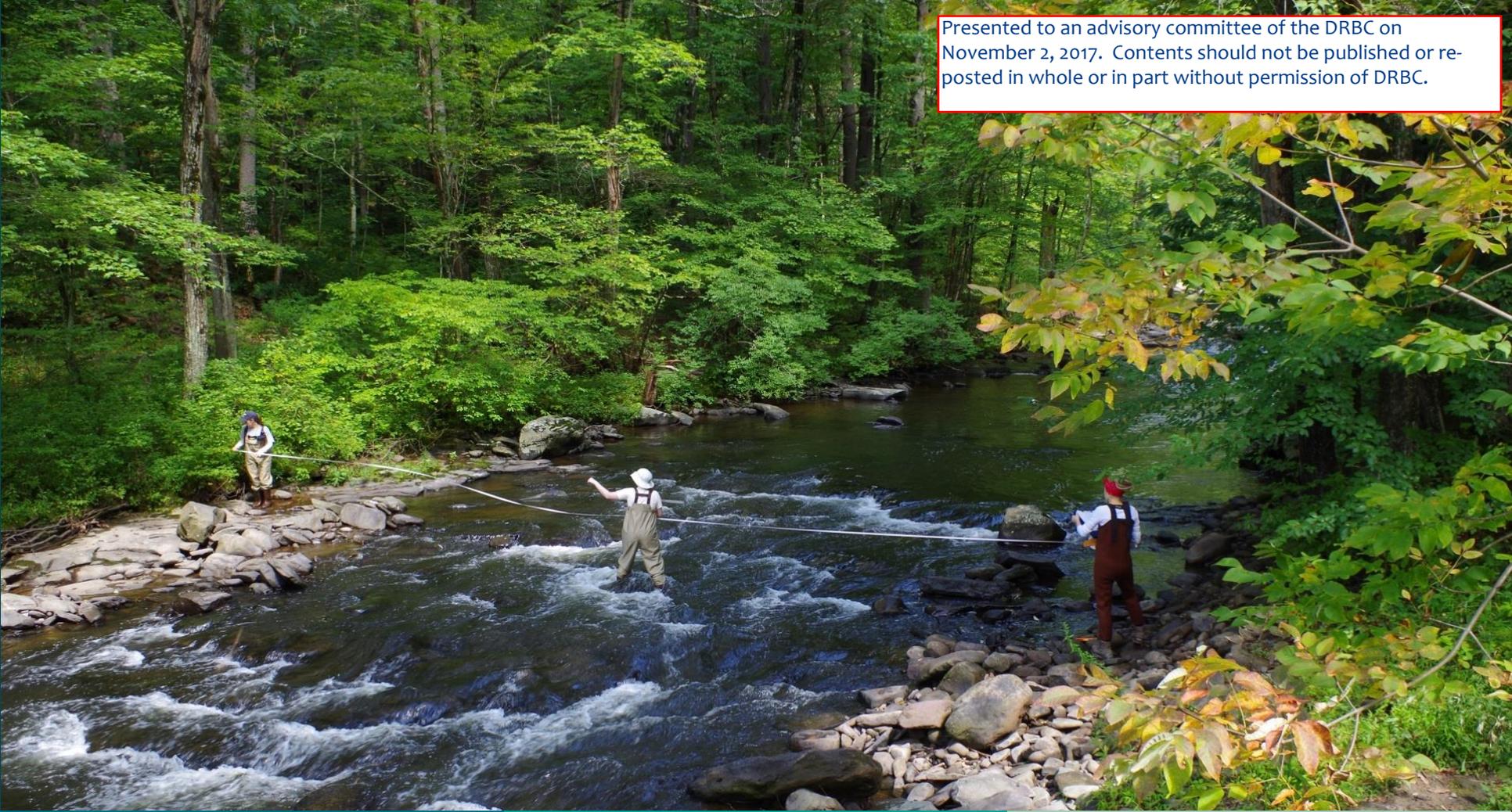
- Starting 2018; At scale of 'measurable change' in water quality.
- Biological Indicators:
  - Macroinvertebrates & Algae/Diatoms (most)
  - Fish (subset)
- Habitat characteristics
- Partial chemistry (annually - seasonally)



● Integrative Sites

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## Questions?

Marie J. Kurz – [marie.kurz@drexel.edu](mailto:marie.kurz@drexel.edu)

DRWI – [www.drwi.net](http://www.drwi.net)



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