Assessment Methodology

Introduction and Working Session

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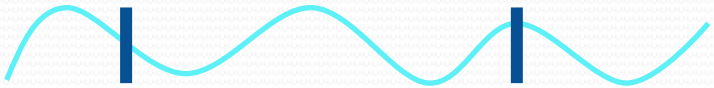
US EPA Region 6
September 2024

1. Define Assessment Units

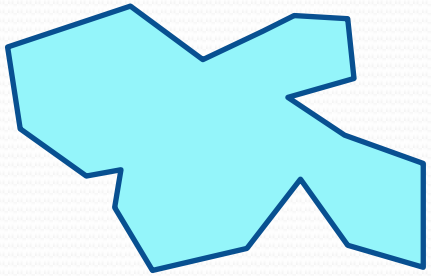
What are your Assessment Units?

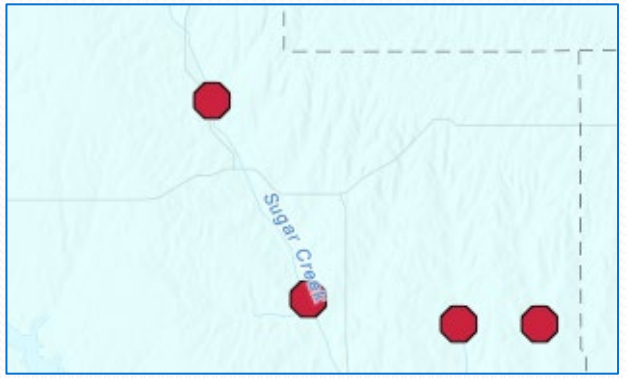
- *Monitoring location only*

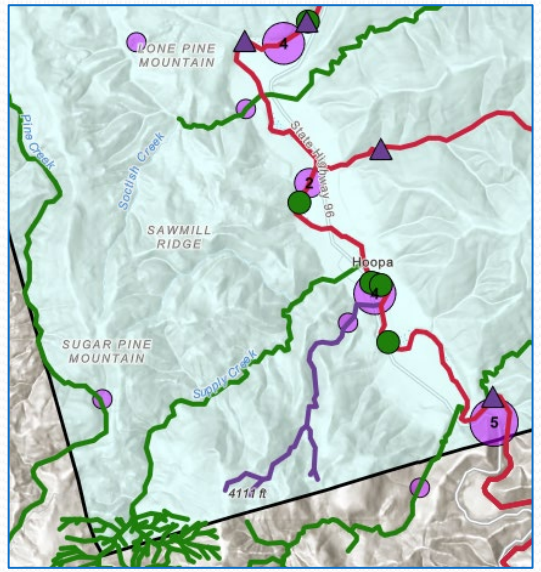
- *A segment/length of the stream*

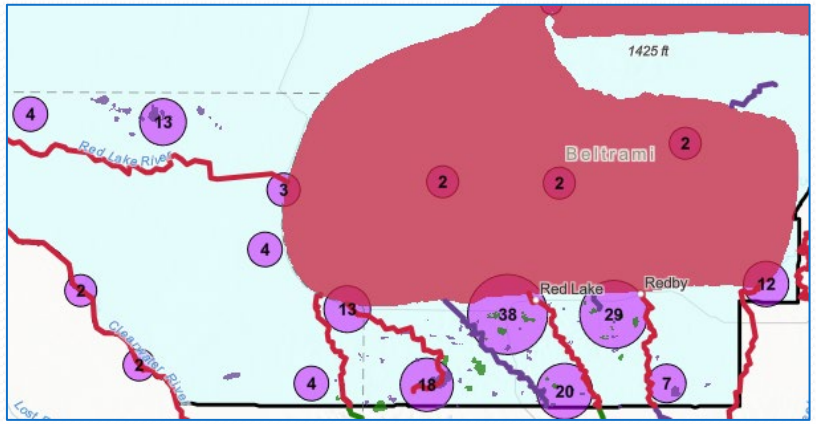


- *An area such as a HUC or Lake*









2. Number of Samples

Parameter	Number of samples for assessment
Dissolved Oxygen	10
Escherichia coli	6

Date	Dissolved Oxygen (mg/L)
7/18/2022	5.29
8/8/2022	3.47
9/12/2022	4.17
10/17/2022	7.09
11/14/2022	6.23

3. Designated Uses, Parameters, and Criteria

Designated Use	Parameter	Criteria
Warm Water Aquatic Life Use	Dissolved Oxygen	6.0 mg/L
Primary Contact Recreation	*Escherichia coli*	410 cfu/100 mL SSM

4. Decision Rules

Parameter	Criteria	Supporting Use	Not Supporting Use
Dissolved Oxygen	6.0 mg/L	≤10% of DO samples are below 6.0 mg/L	>10% of DO samples are below 6.0 mg/L
Escherichia coli	410 cfu/100 mL SSM	≤10% of *E. coli* samples exceed 410 cfu/100 mL	>10% of *E. coli* samples exceed 410 cfu/100 mL

Common Decision Rules:

- Percentage (>10%)
- Rate of recurrence (no more than once in 3 years)
- Outside of a range (x<y>z)
- Not to exceed (>x)

Putting it all Together

Assessment Unit Name

Muddy Creek (MC_01)

Assessment Unit ID (unique)

Designated Use

Parameter	Number of Samples for Assessment	Water Quality Criterion	Decision Rules	
			Warm Water Aquatic Life Use Protected if:	Warm Water Aquatic Life Use Not Protected if:
Dissolved Oxygen	10	6.0 mg/L	≤10% of DO samples are below 6.0 mg/L	>10% of DO samples are below 6.0 mg/L

Parameter Name

Number of samples needed

Criteria Value

Path to determine attainment

Muddy Creek (MC_01)

Parameter	Number of Samples for Assessment	Water Quality Criteria	Decision Rules	
			Warm Water Aquatic Life Use Protected when:	Warm Water Aquatic Life Use Not Protected when:
Dissolved Oxygen	10	6.0 mg/L	≤10% of DO samples are below 6.0mg/L	>10% of DO samples are below 6.0mg/L
Copper	4	$e^{(0.8545[\ln(\text{hardness})] - 1.386)}$	One sample or less in 3 years exceeds the calculated criterion	More than 1 sample in 3 years exceeds calculated criterion
pH	10	Between 6.0 and 9.0	≤10% of pH samples are below 6.0 or above 9.0	>10% of pH samples are below 6.0 or above 9.0
Sulfates	10	20 mg/L	Median of all samples is ≤20 mg/L	Median of all samples is >20 mg/L
Parameter	Number of Samples for Assessment	Water Quality Criteria	Decision Rules	
			Primary Contact Recreation Protected when:	Primary Contact Recreation Not Protected when:
E. coli	6	Geometric mean of 126 cfu/ 100 mL	GM of *E.coli* samples is less than 126 cfu/100 mL AND:	GM of *E.coli* samples is greater than 126 cfu/100 mL OR:
	6	Single sample max of 410 cfu/ 100 mL	≤10% of *E. coli* samples exceed 410 cfu/100 mL	>10% of *E. coli* samples exceed 410 cfu/100 mL

Deep Dive

Data Sources

Where do you store and retrieve your data from to perform assessments?

- Local drives
- Water Quality Portal
- Another repository

Upload QAPP to WQX

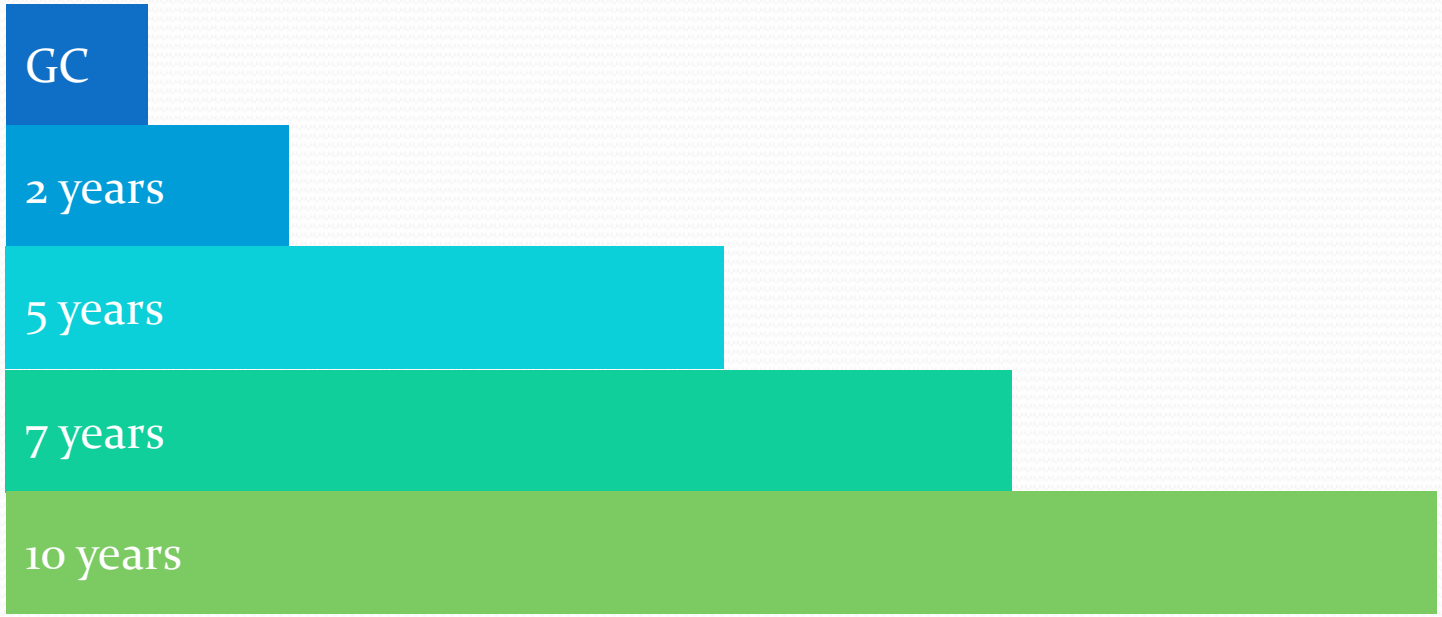
Do you look at data from other organizations?

- Where do you pull that data from?
- Which organizations do you pull data from?
- How do you determine whether that data is useable for your purposes?

Time Period of Assessment

What is the assessment window?

- Grant Cycle
- 2 years
- 5 years
- 7 years
- 10 years



Pathogens & Time Series

Pathogens

How are your pathogens standards assessed?

- Geometric mean
- Single Sample Maximum

Time Series Trend Analysis

Do you use continuous data in your assessments?

Seasonal and Geospatial Criteria

- Do you have seasonal criteria?
  - To which parameters do seasonal criteria apply?
  - When is the season?
- Do you have regional criteria?
  - Warmwater
  - Coldwater/trout or salmon
- Do you have criteria that is applied differently depending on where measurements are taken within a waterbody (i.e. depth profiles)?

Nutrients

- How are your nutrient standards assessed (e.g. annual mean or the 90th percentile)?
- How do you calculate total nitrogen? For example, do you only use raw values reported in total or do you calculate from constituent parts?
- Do you use dissolved values for total criteria if total is not available?
- Do you include a speciation conversion in your methodology? If yes, provide examples.

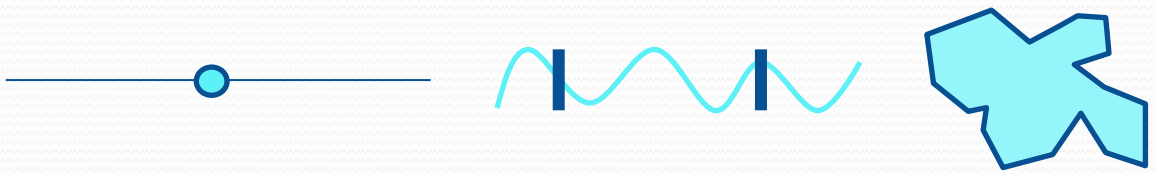
Sediment and Flow

Do you have sediment-based standards (not turbidity)?

- Do you have flow-based standards?
- Do you have criteria specific for mixing or low-flow zones?

Review

- Define Assessment Units
- Define Uses, Water Quality Standards/Criteria/Threshold
- How many results needed?
- What are the Decision Rules?



- Data Sources
- Time Period of Assessment
- Pathogens
- Time Series
- Seasonal and Geospatial Criteria
- Nutrients
- Sediment
- Flow
- Other information that is useful