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# Streamflow Duration Assessment Methods: Reach placement considerations



*Video Training*

2024



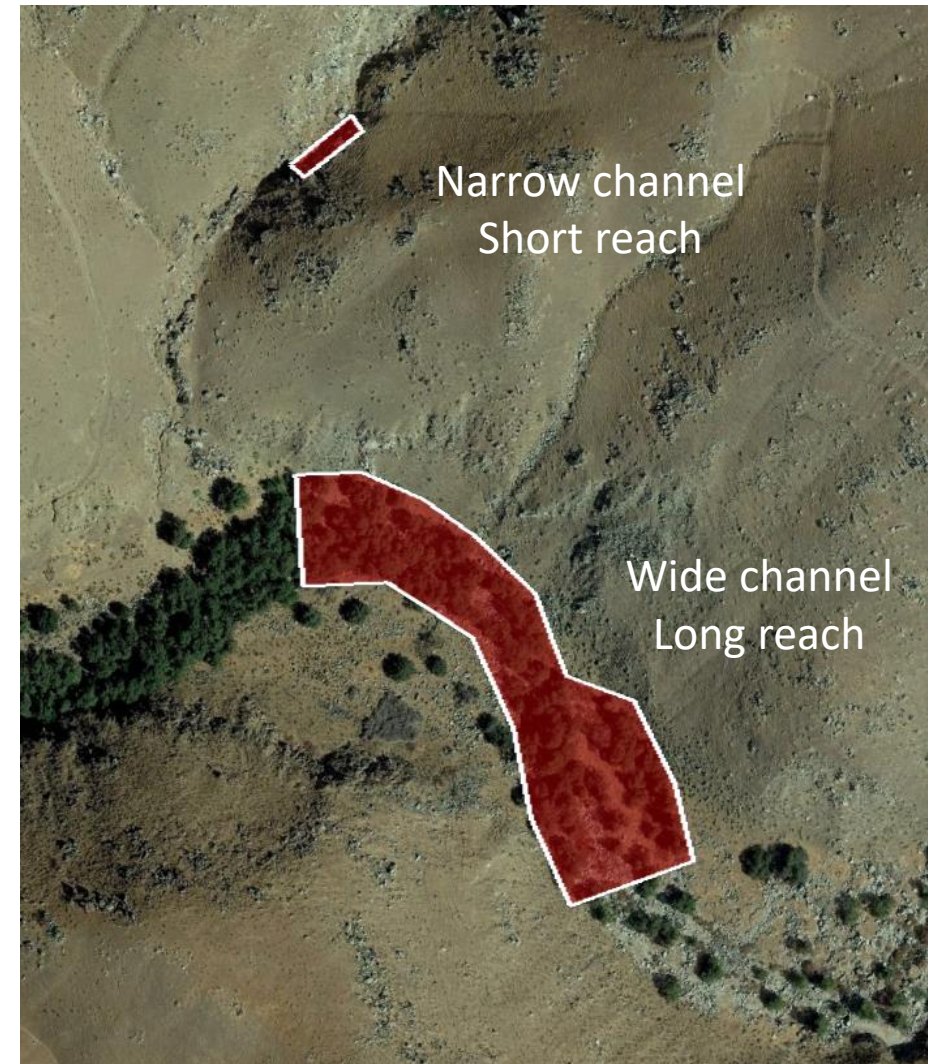
# Reach placement considerations

- Scales of assessment
- Spatial and temporal variability
- Created and modified natural streams
- Disturbed or altered streams
- Documentation of reach placement decisions



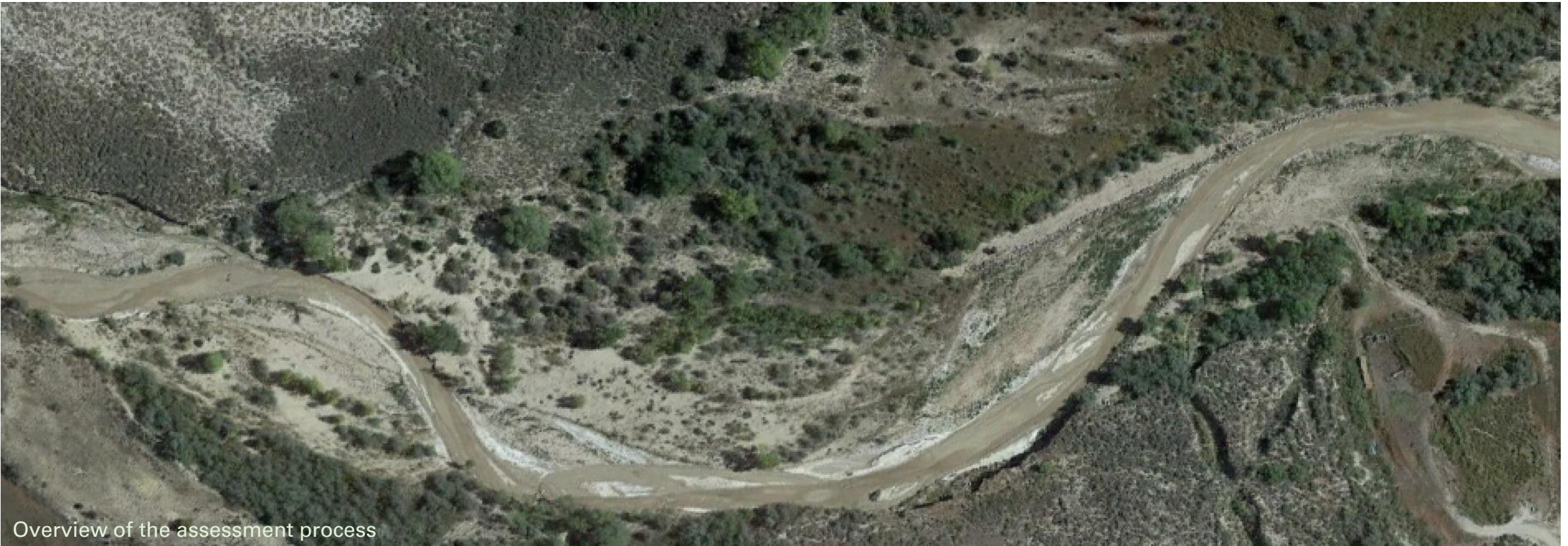
# Scale of assessment

- Assessment reach length is based on mean channel width.
  - Standard is 40 times mean bankfull width
  - No shorter than 40 m
  - No longer than 200 m
- Properly sized assessment reaches are needed to observe indicators.



# Multi-threaded systems

- Include the entire active channel in estimating assessment reach length
- Most indicators may be observed in both primary and secondary channels



# Spatial and temporal variability

Unconfined valley, sparse riparian growth

Confined valley, dense riparian growth

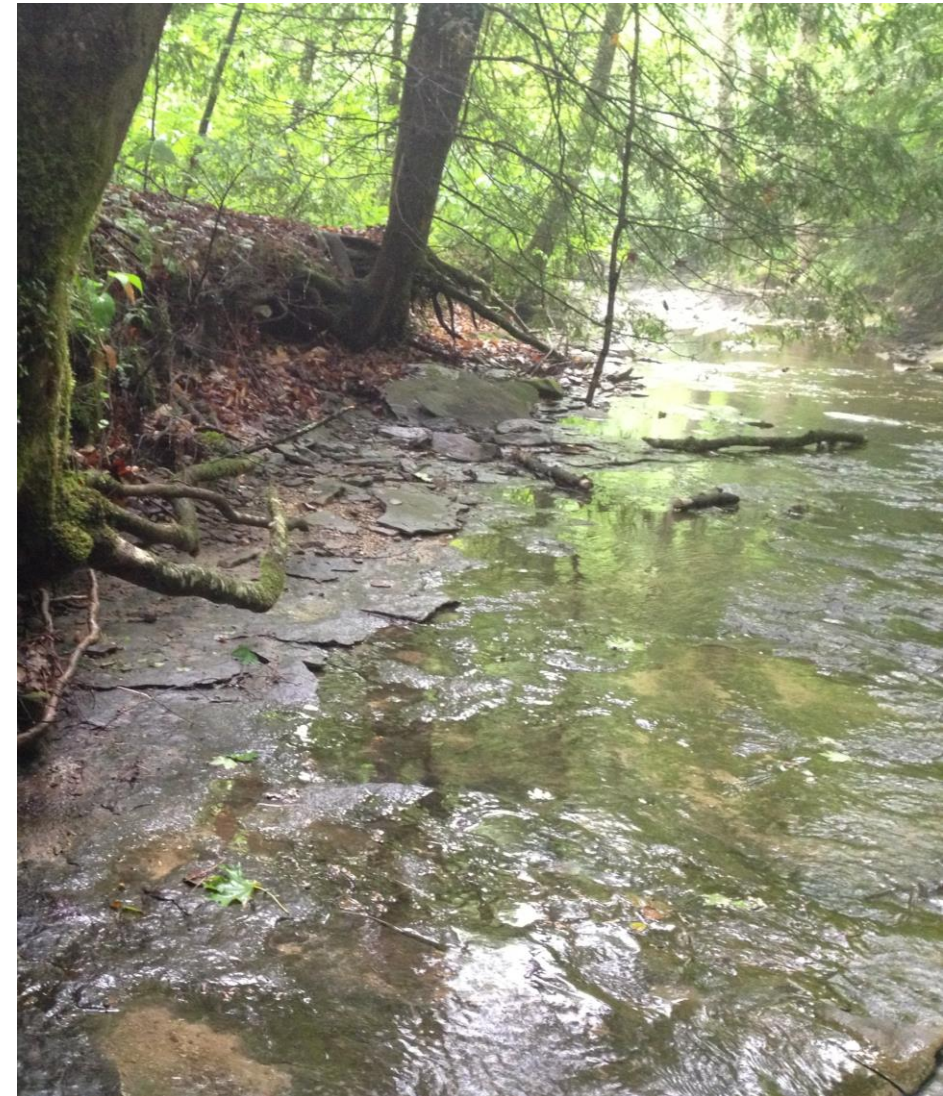


Changes in slope or valley confinement

# Potential sources of spatial variability in streamflow duration

- Changes in stream size, watershed area, or discharge of water
- Changes in sediment loads
- Changes in land use or water management
- Local geological variability (e.g., presence of bedrock material including limestone, sandstone, and shales)

*Document the factors driving reach placement on the field form.*



# Placing the assessment reach

- Where practical, assessments should have relatively uniform channel morphology.
- Focus on *drivers* of streamflow duration, such as valley gradient or width.
- Don't let presence of surface water influence placement!
- Avoid including major tributaries within assessment reach.
- 10-m buffer can reduce influence of road crossings and culverts, if appropriate.
- Reach placement and length may be modified to avoid trespass on private property.

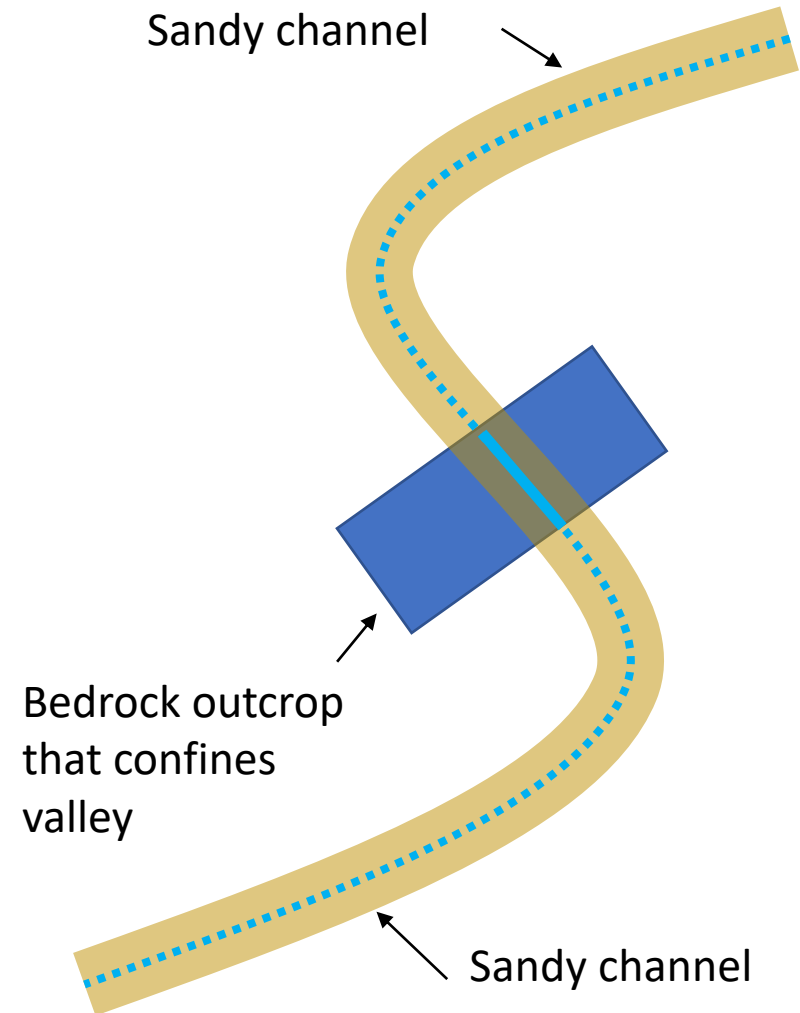
# Road crossings can locally alter flow





# Placing the assessment reach

- Some applications don't allow for discretion: Assess the reach within the specified project area.
  - This means that road crossings, tributaries, etc., may sometimes be included in an assessment reach.
- This may require assessing a relatively heterogenous reach with subsections exhibiting a different flow duration.
- In these cases, portions with longer-duration flows tend to have *a larger influence* on the SDAM classification than portions with shorter-duration flows.



# How many assessment reaches are needed?

- One is sufficient for small project areas, or project areas that have uniform channel morphology and lack transitions in drivers of streamflow duration.
- Multiple assessment reaches may be necessary for large project areas.
- Place assessment reaches to capture possible differences in streamflow duration.
  - Above and below major transitions in channel morphology
  - Above and below major tributaries
  - Above and below road crossings/culverts that alter local hydrology



# What about Modified Systems and Disturbances?

- Modified channels were included in method development
- Non-point source pollution, effluent discharge, habitat alteration, etc., may affect some indicators.
- Veg clearing, grazing, floods, dam operations, re-grading, etc., can temporarily remove indicators from an assessment reach.
  - Most indicators are resilient, but some may be harder to measure. Several indicators can rebound quickly.
  - Return in a few weeks, if possible.
- Disturbances that change streamflow duration class (e.g., diversions, large discharges) will likely result in the new class being identified if sufficient time has passed.



# When should you conduct assessments?

- The peak growing season is best because indicators are easiest to observe and measure.
- Assessments can take place during dry or flowing conditions.
- Streams recently influenced by scour are unsuitable because some indicators are difficult to measure.
- Avoid snowy/icy conditions:
  - Disrupts visibility
  - More difficult to distinguish hydrophytic vegetation



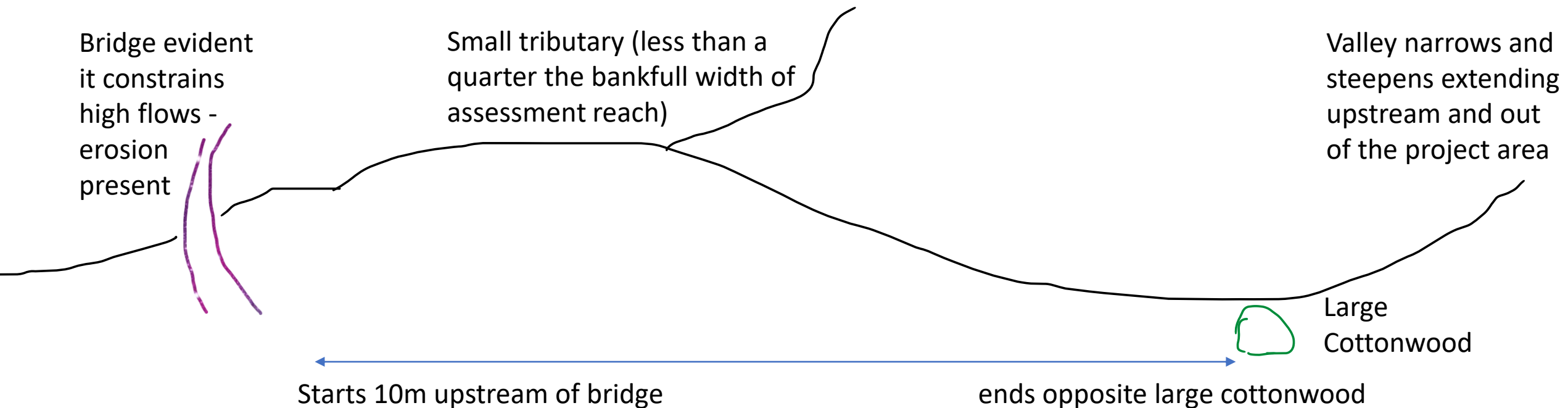
Preferable



Avoid

# Documentation of reach placement decisions

- Site sketch
  - Major features along your reach
  - Factors observed in the project area that were considered when identifying the number of reaches and the placement of the reach



# Knowledge check!

True or false: An SDAM can only be applied in stream reaches exhibiting surface flow:

A. True

B. False

SDAMs may be applied in either wet or dry stream reaches

# Knowledge check!

Which factors can cause changes in flow duration along a stream?

- A. Transitions in valley confinement or gradient
- B. Local water usage (e.g., irrigation withdrawals/returns)
- C. Watershed area
- D. All of the above

All these factors may (but don't always) cause changes in streamflow duration and so if present should be considered when placing an assessment reach or reaches.

# Knowledge check!

An assessment reach should normally be 40X the mean bankfull width. Which of the following are appropriate reasons to use a shorter assessment reach? Select all that apply.

A. To avoid mixing wet and dry segments in a single assessment reach

B. To avoid trespassing on private property

C. To avoid including the confluence with a major tributary in the middle of the reach

D. To save time in the field

Assessment reach placement and length should consider private property boundaries, as well as drivers of streamflow duration.

They should not be modified based on presence or absence of surface water.



# For more information about SDAMs visit



<https://www.epa.gov/streamflow-duration-assessment>