EPA United States Environmental Protection Agency

US Army Corps of Engineers

ERDC

Northeast and Southeast Streamflow Duration Assessment Methods: Drainage Area, Elevation and Average Precipitation

Video Training

2025

The SDAMs are based on 12 indicators:

Nine (9) indicators are measured in the **field,** three (3) are **desktop-based**

Five (5) are shared by both SDAMs, plus:

- Two only used in NE SDAM
- Five only used in SE SDAM

*In recommended order of data collection**

1. Bankfull channel width
2. Entrenchment ratio (NE only)
3. Aquatic macroinvertebrate indicators
   - Benthic Macroinvertebrate Index (BMI) score
   - Total aquatic macroinvertebrate abundance (SE only)
5. Slope (NE only)
6. Shading
7. Prevalence of rooted upland plants in the streambed (SE only)
8. Particle size of stream substrate (SE only)
9. Prevalence of fibrous roots in the streambed (SE only)
10. Drainage area
11. Elevation
12. Average precipitation (May-July) (SE only)

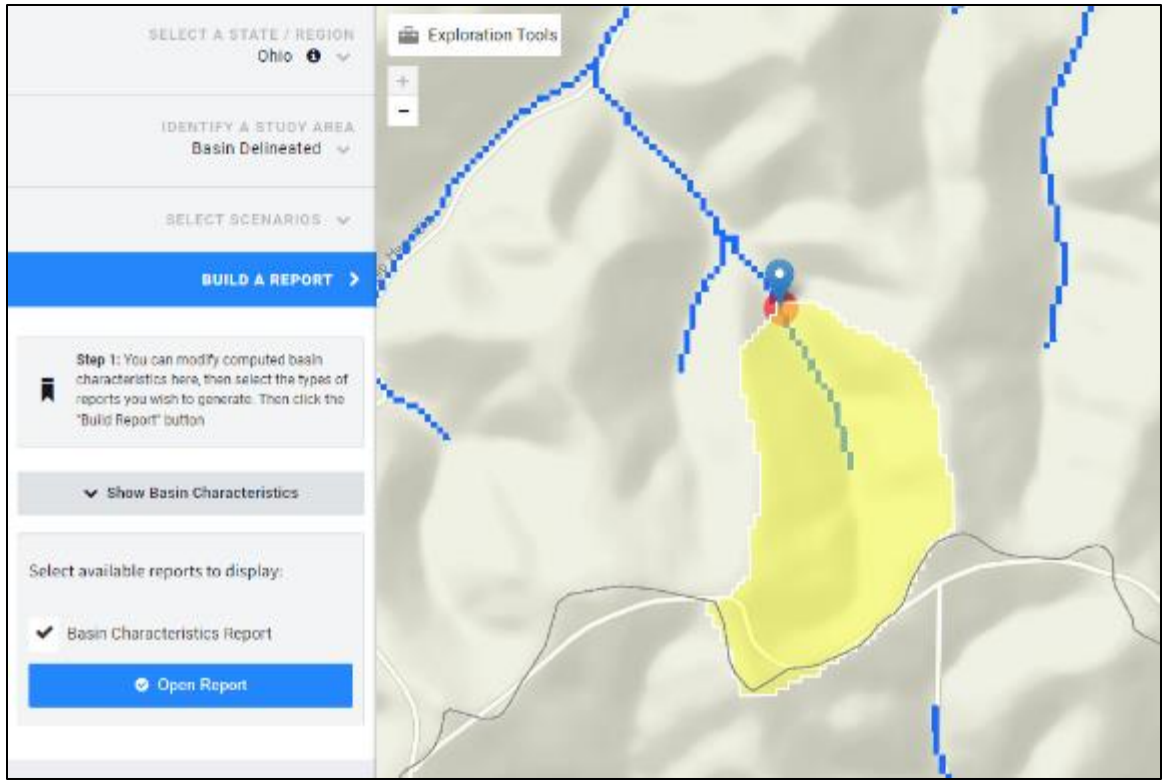
*Note: there is no #4 (1, 2, 3, 5) to account for the two different aquatic macroinvertebrate indicators.

Drainage area

- Drainage area is calculated in square miles, as measured at the downstream end of the assessment reach.
- Can calculate using StreamStats or the National Map:
  - https://streamstats.usgs.gov/ss/
  - https://apps.nationalmap.gov/viewer/
- Geography is limited in StreamStats— Florida, Louisiana, Michigan, and Texas are currently not included. Functionality of drainage area tool may also be limited in certain areas; for these, use the National Map.
- To facilitate accurate drainage areas, collect downstream coordinates with sub-meter accuracy. Also, note any other identifying features—nearby tributaries and with which tributary the assessment reach is associated, surrounding topography, and man-features (roads, buildings).

Drainage area: StreamStats

StreamStats—drainage area calculation is automated for streams where flowlines are available.



To nearest thousandth, drainage area is 0.060 sq. miles in both applications. Input as 0.06 sq. miles.

Instructions to calculate drainage area using StreamStats available in the SDAM for the NE & SE, key points include:

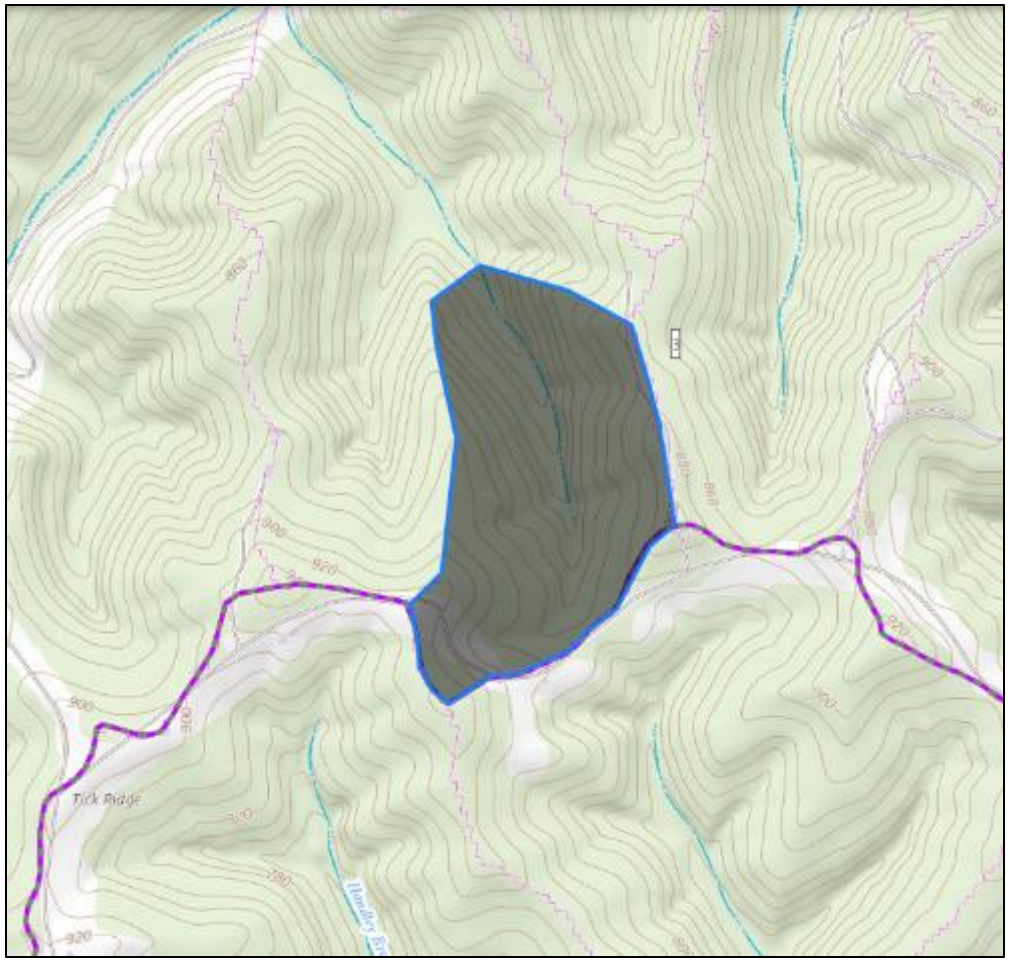
- Refer to field notes and sketches made during the reach assessment that identify features such as roads, confluences, and topographic relief to confirm the reach location when calculating drainage area.
- Different base maps are available for viewing imagery. If the coordinate location does not fall directly on one of the blue water pixels, but its location can be traced perpendicular to a pixel, then using that pixel is acceptable. This should be given careful consideration because selecting a pixel on a larger, downstream segment or parallel segment draining an adjacent catchment would likely produce an inaccurate drainage area. Not all channels observed in the field may be represented as blue pixels in StreamStats. In this case, it is best to refer to field observations of surrounding features and compare with the web map. If the coordinate point does not correspond to a pixel on StreamStats, the National Map viewer should be used.

Drainage area: National Map Viewer

Instructions to calculate drainage area using the National Map are available in the SDAM for the NE & SE, key points include:

- When hand drawing the drainage area boundary on the map, where possible, trace the NHD Plus Catchment boundary; otherwise, use the contour lines for the delineation. Concave curvature (contour lines bending away) represents the valley containing the channels whereas convex curvature (bending toward) represents the ridge.

National Map—drainage area calculation uses NHD plus DA boundaries (purple lines) and contour lines.



Record on the field form

10. Drainage area (NE and SE) (in square miles, if < 1 round to the nearest 0.001)

Notes on drainage area, including method / tool(s) used to calculate:

- Included in both SDAMs.
- Calculate drainage area in square miles using either method—record on field form (if less than 1 square mile record to the nearest 0.001 square mile).
  - For the example reach on the prior slides, drainage area is 0.060 sq. miles in both StreamStats and the National Map. It would be inputted as 0.06 sq. miles.

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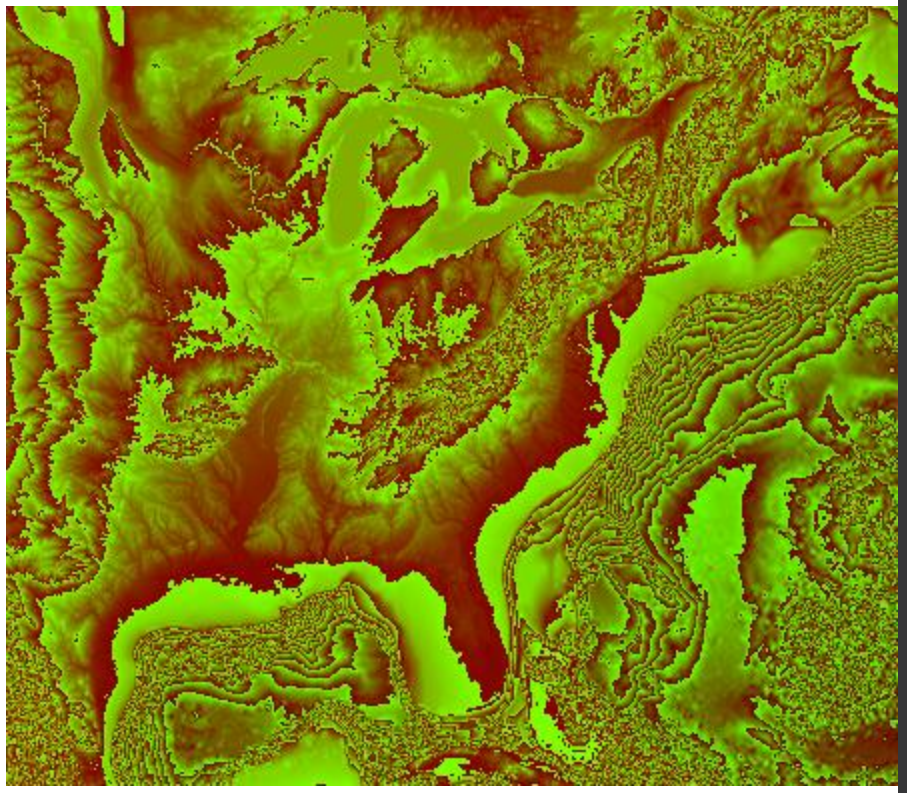
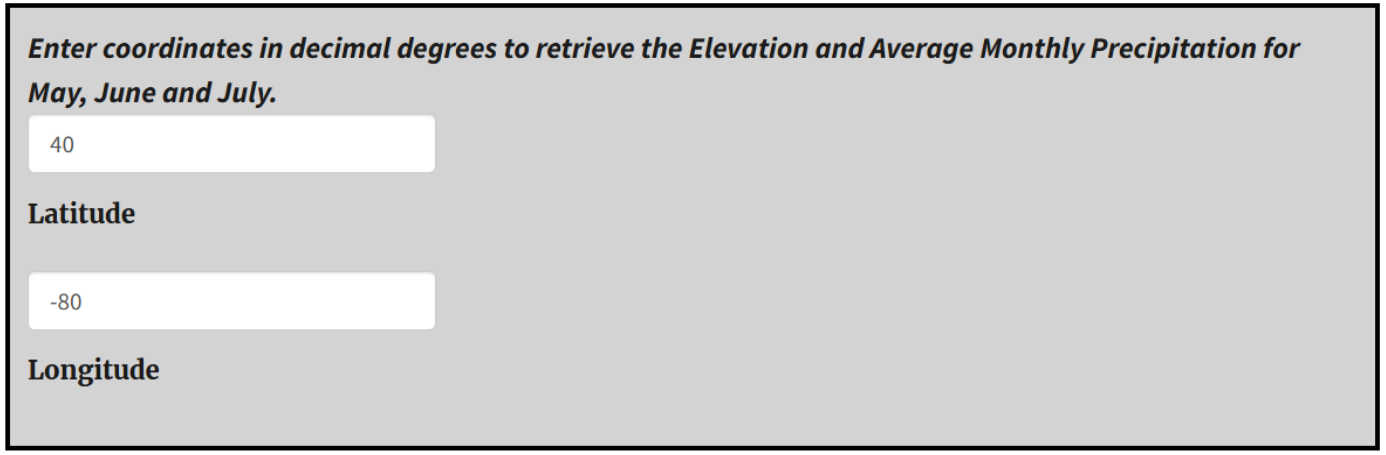
Elevation

- Indicator in both NE and SE SDAMs.
- Method development and the SE SDAM uses elevation values (meters) from the Amazon Web Services (AWS) terrain tiles dataset.
- Web application will automatically calculate based on the coordinates entered or location selected on the map.



AWS Terrain Tiles Dataset



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Average monthly precipitation for May, June and July

Average Precipitation

- Indicator in SE SDAM only.
- Calculated using the 30-year monthly average precipitation from the PRISM (Parameter elevation Regression on Independent Slopes Model) Climate Group statistical mapping system (800-m grid cells). https://prism.oregonstate.edu/
- Average monthly precipitation across three-month period of May, June and July (30-year monthly normals), in millimeters (mm).
- Web application will automatically calculate based on the coordinates entered.

Average monthly precipitation for May, June and July

For more information about SDAMs:

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