

SOP 1.1 – Site Establishment and Documentation

This document provides the guidelines for the documentation of the location and characteristics of sampling sites for both discrete and continuous monitoring.

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I. Equipment and Supplies

- Calibrated water quality meter
- Hand-held GPS unit (check batteries)
- Digital camera (check batteries)
- Site tags, aluminum nails, hammer
- Tag line (measuring tape)
- Field data binder with site documentation data sheets
- Pencils
- Cell phone with emergency contact numbers
- Local map and travel directions

II. Pre-field activities

Several tasks must be completed prior to deploying to potential field sites including:

- (1) Identify site to be established from site selection list (see Appendix A)
- (2) Use GIS to generate approximate coordinates of site and load into hand-held GPS unit
 - a. Name point with the following convention: PARK-xxtemp (e.g., PETE-11temp)
- (3) Locate approximate location of site on park map
- (4) Record travel directions to parking area for sample location on site documentation data sheet
- (5) Plan route from parking area to approximate sampling location
- (6) Gather all equipment (listed above)

III. Field activities

- (1) Navigate to approximate sampling site using travel directions, park map, and hand-held GPS unit
- (2) Scout stream for candidate sampling locations using the following guidelines:
 - a. Locate a well-mixed reach of stream as near to the approximate sampling location as possible

- i. Typically found in run or lower end of riffle habitats
 - 1. Avoid backwaters, eddies, pools, and areas adjacent to confluences
 - ii. Use the water quality meter to ensure that the in-situ measures at the sampling site (temperature, DO, pH, SpC) are representative of the stream as a whole at this site (see SOP 1.9 for guidance on recording water quality observations)
 - 1. Use tag line to place a transect across the stream perpendicular to the bank
 - 2. Stations for cross-section should be evenly spaced across the transect
 - a. If stream width is > 5 m stations should be at 1 m intervals
 - b. If stream width is < 5 m stations should be at 0.5 m intervals
 - 3. At each station sensors should be placed 50% of total depth
 - 4. Use Cross-Section Survey data sheet to record cross section data
 - b. Sampling site should meet minimum depth standards
 - i. For monthly discrete sites: mean minimum stream depth should be at least 10 cm to accommodate sensors
 - ii. For continuous monitoring sites: minimum stream depth should be at least 30 cm
 - c. Evaluation of stream transects should occur bi-annually to ensure that the sampling site is representative of the stream cross-section through time
 - i. Evaluations should occur at a consistent time of year through time (e.g., spring)
- (3) Determine exact sampling location using guidelines above and record detailed notes on where the sample should be captured
- a. Notes should include how to access precise sampling location, if the stream must be entered (sampling location not accessible from the bank or other structure) take clear notes on where to enter stream so that the sample is not compromised
- (4) Obtain coordinates of sampling location using hand-held GPS unit
- a. Collect a minimum of 30 pings to obtain coordinates
 - b. Save the point using the Park code with site number (e.g., PETE-11)
 - c. Record coordinates (Decimal degrees; NAD83) on site description data sheet
 - i. Record estimated accuracy from GPS on data sheet
- (5) Locate a tree adjacent to the sampling site to anchor site tag
- a. Aluminum tags (uniquely numbered; acquired from MIDN forest monitoring supplies) should be attached to the base of the tree (~30 cm) above the ground on the downstream side of the tree using aluminum nails.
 - i. Nails should be driven between 1/3 and 1/2 the length of the shaft at a downward angle so that the tag hangs away from the base of the tree
 - b. On site documentation data sheet record:
 - i. Tag number
 - ii. Species of tree
 - iii. Approximate DBH of tree
 - iv. Additional identifying characteristics
- (6) Collect photo points to document sampling site

- a. Photos should include:
 - i. Sampling location
 - ii. Tag tree
 - iii. Identifying characteristics of site (structures in background etc.)
 - iv. Access points to site
 - v. Additional photos to identify the sampling location and navigation to site
- b. Record data regarding photo including:
 - i. Photo ID from camera for each photo
 - ii. Descriptive caption
 - iii. Record orientation of photo (e.g., photo taken facing downstream with tag tree on river left)

****River right and left should always be used in the context of looking downstream****

- (7) Record remaining site documentation data on field data sheet
 - a. Check over data sheet to ensure all relevant fields are populated including:
 - i. Site ID
 - ii. Coordinates
 - iii. Tree tag number with species, DBH, tree description
 - iv. Station description
 - 1. Identifying characteristics
 - 2. Approximate width and depth of stream
 - 3. Other information
 - v. Travel directions
 - 1. From office to parking location for site
 - 2. From parking area to sampling location
 - a. Directions should be detailed so that an inexperienced technician could navigate to sampling site without GPS navigation
 - vi. Picture information (photo id, caption, date)

IV. Post-field activities

- (1) Upload photos from camera to PC into a temporary location
 - a. Rename photos to reflect photo naming convention and save:
 - E:\NPSTORET\MIDN_PICTURES\"renamed photo"
 - i. Each photo should be named using the Park code, date of the photo, site id and the sequential number of the photo PARK_YYYYMMDD_PARK_id_sequential number (e.g., FRSP_20121031_FRSP_01_1)
- (2) Upload point data to GIS on PC or manually enter point into GIS geodatabase for appropriate park

- (3) Run point through ArcHydro model in ArcGIS to generate surface watershed
- (4) Record drainage area generated by ArcHydro model for the sampling location on site documentation data sheet
- (5) Create station entry in NPStoret

Access to the entry screens for site documentation and analysis methods is provided through the NPSTORET "Main Templates" menu. The site documentation page is accessed through the "Stations" template (see Figure 1).

 - a. See WRD's NPStoret guidance documents and/or videos for assistance
 - i. Populate all fields in NPSTORET new station "main" tab
 - ii. Elevation should be determined through map interpolation
 - iii. Include screen captures of maps in photos section for each site at multiple scales (see attached site report example)
- (6) Archive field data sheet after site has been established in NPSTORET (SOP 2.1)

Sort by: Station ID
NPSTORET Station Entry Template Jump to Station ID:

Main Additional Info ... Pictures WQ Standards Station Groups Projects

Station ID: PAIN Name: Paine Run at SHEN boundary and UVA gage Visits: 1889

Primary Type: River/Stream Est. Date:

Specify the Station's Primary Type

Latitude: 38 11 54.9600 Longitude: 78 47 36.2400 Geo. Method: GPS-Unspecified

- OR - North - OR - West Geo. Datum: North American Datum 1983

Decimal Degrees: Latitude 38.1986 Longitude 78.7934 Map Scale: 1:24000 Accuracy Code:

Elevation: 1390 Units: ft Meth: Topographic Map Interpolation Datum: Elevation From Mean Sea-Level Acc:

County: AUGUSTA State: VA HUC: 02070005 NRCS ID: NHD:

Water Depth:

Station Description: Paine Run at Shenandoah National Park boundary, near University of Virginia (UVA) gage. 253
 Samples should be collected immediately upstream of UVA instrument shed.

Travel Directions: Take US Route 340 about 10.5 miles north from US Route 250 in Waynesboro to State Route 614 (Paine Run Road) between Crimora and Grottoes. 828
 Turn right onto Route 614 and proceed until it deadends at a gate. (GPS coordinates of gate: N 38.19868 W 78.80097.) Walk down the road (private property) until it deadends at the stream. The UVA instrument shed is visible on the right bank upstream from this point.

Station: 142 of 420 (Filtered) Acme Mapper

Figure 1. NPStoret station entry template.