



Quality Assurance/Quality Control Protocol Executive Summary **Muddy Bottom Benthic Macroinvertebrate Method**

The Virginia Save Our Streams (VA SOS) monitors collect benthic macroinvertebrate data across the state. This QAPP summary serves as a reference guide for certified VA SOS monitors, highlighting important protocol details. This summary and the QAPP do not serve as a substitute for attending a VA SOS training event.

- The data collected by VA SOS monitors is used by DEQ and DCR at Level 2. It is used to identify waters where agency scientists will conduct follow-up monitoring. VA SOS data is not used to list impaired streams - instead, it can be used to identify pollution incidents when immediate agency response is required to mitigate the pollution event. VA SOS data may also be used in the development and implementation of Total Maximum Daily Load (TMDL) plans.
- VA SOS volunteers should monitor the benthic macroinvertebrate populations and the habitat of their adopted stream at least two times a year: spring (March 1 – May 31) and fall (September 1 – November 31).
- Data is submitted and reviewed by regional coordinators and the VA SOS Coordinator or designee at least bi-annually. Data is compiled in the VA SOS database, and data is updated to the [Clean Water Hub](#) and the [Chesapeake Data Explorer](#) annually.
- Backup copies of volunteer datasheets must be kept for a minimum of five years, by the volunteer, regional coordinator, or VA SOS main office.
- DGIF must be notified of stream sites and dates of sampling at least 48 hours prior to the sampling events at this address: CollectionPermits@dgif.virginia.gov. Monitors must also carry a copy of the Scientific Collection Permit at all monitoring sessions.
- A monitoring station is defined as a single stretch of stream no more than 100 yards long. Monitoring stations should be at least one quarter mile apart along a stream.
- Volunteers are not to conduct their normal sampling within one week of heavy rainfall if possible (approximately more than 1 inch of rainfall in rural areas or ½ inch of rainfall in urban areas). Rather, they should sample the stream during its average conditions for that season.
- D-nets are required to have a mesh size between 500 (1/50”) and 650 (1/40”) microns.
- Volunteers must take 20 collecting jabs in productive habitats. The four habitats (woody snags, banks, submerged aquatic vegetations, and riffles) should be sampled in proportion to their abundance in the stream segment.

- Contents of the net should be transferred to a sieve bucket or other seining device after each jab.
- Volunteers should use the tally sheet and reference materials to record the number of individuals in each taxonomic group. Benthic macroinvertebrates not included in taxonomic groups on the tally sheet should be totaled and noted in the “other” category on the tally sheet. The total in this box will be included in the total number of organisms in the sample.
- Divide the sample into equal quadrants. The first quadrant should be chosen randomly (eg. coin toss) and all the organisms in that quadrant counted. If the first quadrant doesn’t yield at least 100 organisms, move to a second quadrant and count all organisms on that quadrant. This should be continued until 100 organisms is surpassed or all four quadrants are counted.
- Volunteers should complete a qualitative streamside visual analysis that assesses the general conditions in the stream every time they conduct a biomonitoring session. These data are used to gain perspective on the macroinvertebrate data collected from the same site.
- To maintain active certification, certified monitors must collect and submit data to the VA SOS office at least once every two years.