

Charge to Algae Workgroup

During the deliberations of the NAWQA ad hoc Surface Water Status and Trends Redesign (SWSTR) Committee, consensus was not achieved on the role of algae in basic ecological sampling at the 58 ecological monitoring sites in the network. Pending further deliberation by the SWSTR Committee, algal sampling (e.g., algae Richest Targeted Habitat [RTH] samples, and chlorophyll *a* plus biomass) has been omitted from the design. The Committee agreed to convene a workgroup to address issues associated with algal sampling in the redesigned SWST ecological monitoring network. This workgroup will make recommendations to the Committee about how algae can fit into the SWST basic ecological monitoring design. The SWSTR Committee will revisit its decision to exclude algae from the basic ecological sampling component of the SWST design once it has the recommendations of the work group.

Further, the importance and role of algae is often described from the perspectives of several different water-quality topics/issues such as stream trophic status and nutrient/biogeochemical cycling, partial body contact recreation, or taste and odor. Considerable algae data has previously been collected at NAWQA monitoring sites. However, it is not certain to what extent that NAWQA algae data can be used to address these water-quality topics/issues at the regional and national scale. This workgroup will also evaluate to what extent NAWQA SWST algae data can be used in regional- and national-scale water quality assessments to address these issues of concern.

Specific questions to address on the role of algae in future NAWQA SWST basic ecological data collection

Questions to be addressed by the algae workgroup on the role of algae in SWST basic ecological data collection include:

1. To what degree can samples of algal assemblages (e.g., following NAWQA protocols for algae [diatom] RTH and chlorophyll/biomass samples) be used to address the ecological trends objectives? (Objective 1 is to assess trends in biological condition associated with trends in pesticides and nutrients at select urban and agricultural indicator sites. Objective 2 is to assess trends in biological condition associated with natural hydrologic variation.)
 - Can algal assemblage data be used to assess biological “condition” (i.e., degree of impairment in relation to some benchmark – in a manner similar to indices of biotic integrity, or modeled estimates of observed/expected (O/E) taxonomic composition, such as are commonly being used for invertebrate and fish assemblages)?
 - In what ways do algal metrics that reflect autecological responses to environmental conditions (e.g., components of the algal assemblage that are responsive to elevated nutrients) address or support the interpretation of Objective 1?
2. What are the highest priority “status” and “trends” questions of interest to the water-quality community related to algae in Wadeable streams? How effective are current

protocols and analytical procedures for addressing these questions? Can the protocols be made more effective for addressing these high priority questions?

3. What specific products are anticipated in the context of the SWST redesign using NAWQA protocols for algal assemblages? What analytical methods, indices, or other metrics will provide the basis for these products? Have similar methods been successfully used by others in water quality assessments and/or assessing trends in water quality?
4. Are there issues – such as temporal variability of algal assemblage measures – that negatively affect the appropriateness of algae for evaluating trends. Likewise, if algal assemblage measures are used to assess trends, do they require a different sampling frequency than is needed for invertebrates or fish? What are the cost implications of addressing any issues identified?

Specific questions to address on the role of algae in regional- and national-scale water-quality assessments

Questions to be addressed by the algae workgroup on the role of algae in regional- and national-scale water-quality assessment include:

1. To what extent can existing NAWQA SWST algae data provide information on current conditions and trends for each of the above specific water-quality topics/issues (stream trophic status and nutrient/biogeochemical cycling, partial body contact recreation, or taste and odor) in Wadeable streams at regional and national scales?
2. Are there approaches that can be used to “scale up” the spatial and temporal scale of data collected at the 58 site SWST ecological network for algae to provide for appropriate and reasonable regional- or national-scale assessments?

Scope

The scope of this workgroup is limited to the ecological sampling component of the SWST design (ecological sampling at the 58 sites included in the current ecological data network and historical algae data collected at monitoring sites in previous NAWQA SWST networks). There may be algae issues related to other aspects of the NAWQA program, but this workgroup is not intended to address them. It is expected that most workgroup business will be conducted via conference calls or cyber seminars with possibly one or two meetings.

Composition and tenure

Composition of the algae workgroup shall include: (1) Selected members of the current trends redesign committee, and (2) USGS scientists from within and outside the NAWQA program.

Committee members will represent a mix of people with knowledge of algal ecology and people with knowledge of regional- and national-scale water-quality assessments. The workgroup is expected to solicit input from, and include in conference calls or meetings as deemed appropriate, other scientists and managers with relevant expertise in algal ecology and/or water-quality assessments. These experts (whether from USGS, other agencies, academia, or other) may be included in conference calls or meetings as deemed appropriate, and their perspectives would be cited by the workgroup; however, they would not have voting status, nor would they be official authors of the recommendations.

Timing

The algae workgroup will report its recommendations to the SWSTR Committee by January 31, 2007. This will allow the Committee time to consider the recommendations and make a final decision on including of algae in the basic ecological component of the SWST design in time to include algae sampling in the FY07 field season if the committee so decides.