



# WI DNR Field Procedures Manual

Intranet Edition

## Part B: Collection Procedures

### 1003 PERIPHYTON SAMPLING AND ANALYSIS

Note: Method 1003 is used extremely infrequently and does not warrant a revision. This method is subject to removal pending a more formal survey of its utility (as of September 1995).

#### A. Scope:

The Wisconsin DNR has limited periphyton sampling experience. Therefore, this manual will not recommend or discuss any specific procedures in detail. Periphyton sampling and analysis is recognized as a tool to evaluate the effects of pollution on water quality, especially the impact of excessive nutrients and organic material. Prior to the construction of secondary and advanced waste treatment facilities periphyton was an effective tool to document water quality degradation. With modern treatment facilities, the ability to detect impacts by sampling periphyton is questionable.

Some authors have stated they do not favor use of periphyton alone for assessment of water pollution; and that other techniques, such as macroinvertebrates, are more valuable and rapid with less intensive input of highly skilled specialists required for periphyton.

The type of organisms making up periphyton do tend to bioconcentrate many compounds from the water column. Periphyton could prove useful for detecting the discharge of low level or intermittent toxic compounds to surface waters. Collection of periphyton from natural substrates rather than artificial substrates is recommended for this purpose.

#### B. Safety:

Samples may be collected by wading or from a boat. Collections in cold water periods require the investigator to be cautious about the consequences of hypothermia. Feltsoled wading boots are recommended for stoney streams and lakeshores, especially at sites with high current velocity and/or deep waters in close proximity. A wearable personal floatation device (PFD) is also recommended for sites with high current velocity and/or adjacent deep water. At sites with dangerous high velocities or depths, either a coworker should be stationed on shore with a throwable (Type IV) PFD or collections should not be attempted. The investigator must evaluate the site for safety prior to collection and use his or her own judgement on the level of safety precautions needed.

When using boats, basic safety regulations for boating should be followed. In addition, common sense dictates the use of stable, shallowsided boats when sampling over the sides. A wearable

PFD should be worn in all situations when sampling from a boat.

### **C. Collection and Analysis Procedures:**

Following is a list of references covering traditional periphyton sampling and analysis procedures. The referenced procedures are applicable for the collection of periphyton from natural or artificial substrates in lakes and streams. Because WDNR staff have little experience sampling periphyton, specific procedures are not recommended. Periphyton sampling and handling procedures for analysis of organic or inorganic compounds have not been developed. Contact the Bureau of [Water Resources Management monitoring coordinator](#) or the Lab of Hygiene for information.

### **D. References:**

1. Beak, T. W., Griffing, T. C., and Appleby, A. G. 1973. Use of Artificial Substrate Samplers to Assess Water Pollution. In, Biological Methods for the Assessment of Water Quality, ASTM STP 528, Amer. Soc. for Testing and Materials, 1973, pp. 227241.
2. Collins, G. B. and C. I. Weber. 1978. Phycoperiphyton (Algae) as Indicators of Water Quality. Trans. Amer. Micros. Soc. Vol. 97, No. 1, Jan. 1978, pp. 3643.
3. Cooke, W. B. 1956. Colonization of Artificial Bare Areas by Microorganisms. The Botanical Review, Nov. 1956, Vol. 22, No. 9, pp. 613638.
4. Standard Methods for the Examination of Water and Wastewater. 15th Edition, 1980, pp. 964983. (Contains many excellent references.)
5. U.S. Dept. of Interior. 1977. Techniques of Water Resources Investigations of the United States Geological Survey. Book 5, Ch. 44, Methods for Collection and Anal. of Aq. Biol. and Micro. Samples. pp. 127137.
6. U.S. EPA. 1973. Biological Field and Laboratory Methods. EPA670/473001. Off. of Res. and Devel., Cincinnati, Ohio.

*Rev. 1, September 1993*

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Last Revised: October 16, 1997.  
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