

**BIOLOGICAL QUALITY ELEMENTS ACCORDING TO WATER FRAMEWORK
DIRECTIVE: PHYTOPLANKTON AND PHYTOBENTHOS**

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EXPERTISE THESIS ABSTRACT

The Water Framework Directive (WFD; 200/60/EC) creates a new legislative framework to manage, use, protect and restore surface water and groundwater resources within river basins and transitional and coastal waters in the European Union. The WFD aims to achieve sustainable management of water resources, to reach good ecological quality and prevent further deterioration of surface waters and groundwater and to ensure sustainable functioning of aquatic ecosystems by 2015. In WFD the ecological status of surface water is defined as “an expression of the quality of the structure and functioning of aquatic ecosystems associated with surface waters, classified in accordance with Annex V” (Article 2:21). This implies that the classification systems of the ecological status of water bodies should reflect changes in the structure of the biological communities and in the overall ecosystem functioning as a response to anthropogenic pressures. Such requirements are novel developments in European water policy, which has been mostly based on the regulation of emissions at the source through the establishment of emission limit values.

The WFD necessitates that the ecological quality status of surface water bodies is assessed using biological quality elements such as phytoplankton, fish, and benthic flora and fauna. Therefore, there is a need to identify biological indicators that respond in a predictable manner to human disturbances, and allow classification of ecological quality based on functional relationships between pressures and indicators. Currently, intensive researches are being carried out in Europe to develop biological indicators and classification metrics that can be used in assessment, comparison and harmonization of ecological water quality targets across Europe. These works are naturally based on the research on the ecological functioning of surface waters. Still the WFD has imposed challenges for aquatic ecologists to develop scientifically sound, high-precision, and biological assessment tools for managers.

In this study, it is aimed to draft a source of information, which Turkey benefit from in the implementation of WFD, by making use of European, American, Turkish standards, and the know-how of the EU Member States which comes from the comprehensive projects. This study covers

sampling and analysis of phytoplankton and phytobenthos which are used as biological quality elements in monitoring of surface water bodies according to WFD. In addition, an inventory of all the metrics that are used by the EU Member States in calculating the ecological quality ratios of phytoplankton and phytobenthos has been made, and the applicability of these metrics in Turkey has been discussed.

Keywords: Water Framework Directive / biological monitoring / phytoplankton / phytobenthos / diatom