



Review

Assessing the ecological status in the context of the European Water Framework Directive: Where do we go now?



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HIGHLIGHTS

- A Science-Policy Interface activity was led by DG Research & Innovation and Onema.
- The aim was to establish a list of research needs for enhancing WFD implementation.
- For ecological status, 10 research issues were identified.
- The outcomes of SPI are likely to feed into the revision of the WFD.

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ABSTRACT

The Water Framework Directive (WFD) is now well established as the key management imperative in river basins across Europe. However, there remain significant concerns with the way WFD is implemented and there is now a need for water managers and scientists to communicate better in order to find solutions to these concerns. To address this, a Science-Policy Interface (SPI) activity was launched in 2010 led by Directorate-General for Research and Innovation and Onema (the French national agency for water and aquatic ecosystems), which provided an interactive forum to connect scientists and WFD end-users. One major aim of the SPI activity was to establish a list of the most crucial research and development needs for enhancing WFD implementation. This paper synthesises the recommendations from this event highlighting 10 priority issues relating to ecological status. For lakes, temporary streams and transitional and coastal waters, WFD implementation still suffers from a lack of WFD-compliant bioassessment methods. For rivers, special attention is required to assess the ecological impacts of hydromorphological alterations on biological communities, notably those affecting river continuity and riparian covering. Spatial extrapolation tools are needed in order to evaluate ecological status for water bodies for which no data are available. The need for more functional bioassessment tools as complements to usual WFD-compliant tools, and to connect clearly good ecological state, biodiversity and ecosystem services when implementing WFD were also identified as crucial issues.

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1. European context

The European Water Framework Directive (WFD), which was adopted in 2000, changed the way European Union (EU) Member States (MS) considered water management by putting ecosystem integrity at the base of management decisions (European Commission, 2000). Since then, all MS expended considerable time and resources to collect appropriate biological, environmental and pressure data and to develop operative tools in order to elaborate river basin management plans (Birk et al., 2012). As the magnitude and difficulties of this large-scale endeavour became evident, both the European community and individual MS have funded a large number of research projects, particularly in the areas of ecological assessment and catchment modelling (e.g. Hering et al., 2013).

The WFD was welcomed by many for its innovativeness and the radical shift towards measuring the status of all surface waters using a range of biological communities rather than the more limited aspects of chemical quality or targeted biological components. A WFD-compliant method necessarily complies with the requirement to include all the

biological parameters listed in the normative definitions (Annex V), relates to reference conditions *i.e.* pristine conditions and expresses results as an Ecological Quality Ratio, a relative and comparable measure of quality. Recent years have been pivotal for ecological assessment of water quality in Europe (Nöges et al., 2009; Hering et al., 2010). After several years of scientific and technical work as well as important financial contributions from MS, the second round of intercalibration for biological methods was achieved, greatly improving homogeneity in the assessment of ecological status throughout Europe (Birk et al., 2013), for all surface water body categories (rivers, lakes, transitional and coastal waters). A major step was achieved at the end of 2012 with the intercalibration of 230 methods from 28 countries (European Commission, 2013a). Nevertheless, further effort is still required as around 100 methods (30% of the total) are not developed and/or not intercalibrated (Poikane and van de Bund, personal communication).

A key stage in the implementation of the WFD was therefore reached, whereby a state-of-the-art evaluation can be undertaken and the scientific outputs required to move forward in water management identified. More and more tools are becoming available for integrative

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