

# Consideration of hydromorphology and sediment in the implementation of the EU water framework and floods directives: a comparative analysis of selected EU member states

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## Keywords

flood defence/management; floods directive; fluvial; policy; river basin management; sediments; water; water framework directive.

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## Abstract

The EU Water Framework and Floods Directives represent important legislative instruments introduced in the water policy during the last two decades. Despite their holistic and complementary approaches, which should yield many benefits, the lack of importance given to the consideration of hydromorphology and sediments is a weakness. This will hinder the achievement of the Directives' goals, since hydrology and geomorphology of rivers and the character and dynamics of sediments are essential components of the aquatic habitat and ecosystem health. The entrainment, transport and deposition of sediments determine the interrelationships between river channel geometry and flow regime, which affect flood risk. The paper reports on the findings of a survey undertaken in 2015 as part of the HYTECH project, which questioned 20 EU Water Authorities about the importance they attached to hydromorphological quality elements and sediment transport during the implementation cycles of both Directives.

## Introduction

In Europe, the quality of freshwater ecosystems is one of the most important concerns for the future, as recognised by the EU Directive 2000/60/EC, namely the Water Framework Directive, hereafter called WFD (EU, European Union 2000). The Directive represents a new integrated approach to water protection, improvement and sustainable use, coordinates the application of other water-related legislations (e.g. Urban Waste Water, Drinking Water, Seveso Directive, Habitats and Species Directive) and provides a coherent management framework with the aim to meet its goals in an integrated way (Clarke *et al.* 2003; Brils 2008; Nones 2015a; Nones 2016). Moreover, the WFD introduces the management of rivers at the catchment scale, defining River Basin Districts based on geographical and hydrological characteristics, instead of using administrative or political boundaries. For each district, a River Basin Management Plan is established and updated every 6 years with a period for stakeholder consultation and detailed programmes of measures have to be set up in accordance with it. Of the several WFD

deadlines, the most important one is the achievement of at least good ecological and chemical status for surface waterbodies and good quantitative and chemical status for groundwaters by 2027. Groundwaters are now covered by the Groundwater Directive 2006/118/EC, which has been developed after the Article 17 of the Water Framework Directive.

Following Article 2 of the WFD, 'good ecological status' only permits a slight reduction in water quality when compared to the unmodified natural conditions for that waterbody type, assumed as the reference condition. Deviations from reference conditions are assessed by means of biological, hydromorphological and physico-chemical quality elements. But it is only in the designation of high status that rivers must achieve hydromorphological characteristics (channel patterns, width and depth variations, flow velocities, substrate conditions, structure and function of the riparian zones) (Table 1) which 'correspond totally or nearly totally to undisturbed conditions' (WFD, Annex V), and interestingly there is no recall to sediment transport. Thus, following this Annex and as explained in the CIS Guidance n° 13