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Assessing water ecosystem services for water resource management

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Abstract

Ecosystem service concepts can offer a valuable approach for linking human and nature, and arguments for the conservation and restoration of natural ecosystems. Despite an increasing interest in the topic, the application of these concepts for water resource management has been hampered by the lack of practical definitions and methodologies. In this study we review and analyse the current literature and propose an approach for assessing and valuing ecosystem services in the context of water management. In particular, to study the link between multiple pressures, ecological status and delivery of ecosystem services in aquatic ecosystems under different scenarios of measures or future changes. This is of interest for the development of River Basin Management Plans under the EU Water Framework Directive. We provide a list of proxies/indicators of natural capacity, actual flow and social benefit for the biophysical assessment of the ecosystem services. We advocate the use of indicators of sustainability, combining information on capacity and flow of services. We also suggest methods for economic valuation of aquatic ecosystem for each service and spatial scale of application. We argue that biophysical assessment and economic valuation should be conducted jointly to account for the different values of ecosystem services (ecologic, social and economic) and to strengthen the recognition of human dependency on nature. The proposed approach can be used for assessing the benefits of conservation and restoration of aquatic ecosystems in the implementation of the EU water policy.

Keywords: ecosystem services, water resources management, aquatic ecosystems, ecosystem services valuation, bi

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