Emergent properties of the Lower Danube River System: The consequences for the integrated monitoring system

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With 6 figures and 4 tables in the text

Abstract: The Lower Danube River Systems (LDRS) is a complex system composed of natural ecological systems (NES) and socio-economic systems (SES). This paper presents the emergent properties of the components of the LDRS (NES, SES, and SES-NES systems) and suggests indicators which would have to be assessed by the integrated monitoring system. The method consists of processing the information about socio-environmental systems, about resources and services provided by fluvial systems, and about indicators of their production, using a set of methodological principles. The results consisted in a refinement of the structural model of the SES, a tentative list of the indicators to be included in an integrated monitoring system of the LDRS, and several principles for structuring the specific information system for macro-landscapes such as LDRS. It is concluded that whether explicit or as a recognized constraint, objectives related to the natural capital have to be considered in the design of integrated management plans at all SES hierarchical levels. Performing this design in an effective way requires a wide range of data, which can be provided by an integrated monitoring system structured as suggested in this paper.

Key words: macro-landscape, fluvial system, Danube, socio-environmental system, monitoring.

Introduction

The Lower Danube River Systems (LDRS) is a socio-environmental system subject to management in view of sustainable development. The objectives of this paper are:
1. to present a structural model of the LDRS,
2. to identify the emergent properties of the components of the LDRS (natural ecological systems - NES, socio-economic systems - SES, and SES-NES composite systems), and

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