

Socio-ecological evaluation of estuary-scale interventions: Case study of reopening the Haringvliet, the Netherlands

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Abstract

Estuaries are considered valuable regions, both socio-economically and ecologically. The gradients in physical characteristics like salinity present result in a high biodiversity, while the provision of many ecosystem services have attracted human settlement and activity. Human activities and estuarine biodiversity are often at odds with each others, leading to socio-ecological trade-offs in decision- and policy-making in which the ecological perspective is generally underrepresented. In this study, we implemented a hydrodynamic model to explore the socio-ecological implications of reopening the closed-off Haringvliet estuary in the Netherlands. Our socio ecological evaluation considers the trade-off between freshwater availability and ecological diversity. In the case of the Haringvliet, we have shown that partially opening the gates enhances diversity in the system against no — or limited — loss of freshwater availability. All in all, the use of representative (non-monetary) performance indicators for the considered stakeholders allowed us to demonstrate the trade-offs in a clear fashion: the Pareto-front resulting from these performance indicators is an intuitive visualization for decision- and policy-makers as well as the communication to the public.

Keywords

Nature-based solutions, Ecotopes, Physiotoxes, Salt intrusion, Haringvliet

Elsevier, Ecological Engineering 230 (2026) 108031

The full article can be requested at the publisher (doi.org/10.1016/j.ecoleng.2026.108031) or at HKV (secretariaat@hkv.nl), for personal use only.