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Utility of models in setting restoration objectives

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Abstract

Estuaries are both naturally complex and human-impacted environments where restoration initiatives may suffer from the lack of ecological knowledge and methods to set restoration objectives. Despite a growing number of published case-studies, it remains difficult to establish a clear link between ecological benefits following restoration operations and pragmatic restoration actions. In France, the French Office for Biodiversity (OFB) and the French Geological Survey (BRGM) developed a framework for ecological restoration in estuaries to promote and implement actions. Relying on the need to consider not only structures but also processes, this framework leads to the necessity to set measurable and achievable restoration goals at the relevant spatial scale (taking into account the physico-chemical estuarine gradients). Interviews with managers identified the difficulties in programming restoration operations and a need for in-depth analysis of restoration experiences with respect to the conceptual framework and available decision support tools. The work offers in particular a structured consideration of the use of modelling tools given the damaged or lost ecological functions. Their use and limits are discussed in the context of different estuarine functioning (hydromorphosedimentary, biogeochemical and as a support for different species life cycle), acquired and missing knowledge, data and skills requirements.

Keywords

modelling, objectives, restoration actions, ecological functionning