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TITLE: ODEMM in the Celtic Seas: a qualitative IEA with decision support tools.

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In order to deliver holistic ecosystems-based marine management, managers must know the factors affecting the ecosystem if they are to manage them. Here, we present a risk assessment framework, based on the ODEMM (Options for Delivering Ecosystem-based Marine Management) approach for the Celtic Seas. The framework traces the multiple sectors affecting the marine environment, the numerous pressures they create, and the ecological characteristics affected by them. Scores are assigned via an expert panel and cross-check methodology which detail the extent, overlap, degree of impact, persistence and resilience for each pressure pathway, based on pre-determined thresholds. From this information, pressure matrices are created that can be used to calculate scores to indicate an overall impact risk score and expected recovery timeline estimates. Further, this information can be used to create easily interpretable and understandable tools for communicating complex messages in a simple format to non-scientists such as policy-makers and stakeholders. Finally multiple sources (e.g. literature, spatial maps, reports) and methods (e.g. integrated trend analysis) can be incorporated to allow the building of a data support tool, which dually functions to provide confidence levels for the identified pathways, and provides a 'gaps analysis' for future research. Together, these tools can be used to help enlighten stakeholders and enable policy-makers to make informed decisions, and can be readily adapted to a range of scales. In light of the complex landscape of ecosystem-based management and the Marine Strategy Framework Directive, these tools have a real benefit in the simplicity of their understanding.

Keywords: ODEMM, risk assessment, Celtic Seas, decision support, communication tools, integrated ecosystems assessment.

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