



## **Skill assessment of a coupled hydrodynamic-ecosystem coastal-ocean model**

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Marine systems models are becoming increasingly complex and sophisticated but far too little attention has been paid to model errors and the extent to which model outputs actually relate to ecosystem processes. In this paper we describe the application of summary error statistics to a complex 3D model (POLCOMS-ERSEM) run for the period 1988-1989 in the southern North Sea utilising information from the North Sea Project, which collected a wealth of observational data, and the Continuous Plankton Recorder Survey. To understand model data misfit and the mechanisms creating errors, we demonstrate the need for a hierarchy of techniques, including simple correlations, model bias, model efficiency, binary discriminator analysis and the distribution of model errors to assess model errors spatially and temporally. We also demonstrate that a linear cost function is an inappropriate measure of misfit. Our analysis indicates the model has some skill for all variables analysed, and where improvements to the model are required.