

Chapter: 5.9 - Modelling estuaries in data-poor environments

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Taljaard, Susan
Council for Scientific and Industrial Research (CSIR)
Meiring Naude Drive, Pretoria, 0184
Email: STaljaar@csir.co.za

Models are inherently data-hungry for the construction, calibration, validation and predictive capacity that is demanded of models. In data-poor environments, a severe challenge to modelling is the lack of historic data, and present lack of sufficient monitoring programmes of important variables and number of estuarine ecosystems. This is largely due to lack of infrastructure, skills, political will, and monetary support. However, environmental challenges do not wait for adequate datasets to arrive to inform decision-making, and therefore different pathways to modelling that inform both research and management are needed. We present approaches to water quality, ecosystem modelling and climate change research in South African estuaries, as a representative of a data-poor environment. Such approaches aim to use available data in novel ways to inform research and decision-making, and identify data and information gaps. We propose that such methods be used in other data-poor areas with similar types of estuaries as South Africa and we provide recommendations how to construct, validate and use models and their outcomes. The communication of model uncertainty for research purposes and to decision-makers takes an important place in such endeavours.