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## **Computing ecosystem services in the Peel-Harvey estuary: from conceptualization to implementation**

**Key words:** Operational Indicators, Societal Values, Modeling Ecosystem Services

### **Abstract:**

Conceptual frameworks of ecosystem services (ES) have evolved in recent decades. However, an operational implementation of an integrated approach to ecosystem management suitable for estuaries is still lacking; mainly due to absence of reliable data. The present paper identifies a matrix of key operational indicators, which were derived from a comprehensive analysis of core ecosystem properties within the “Peel-Harvey Estuarine System”. Focus was given to estuarine processes which deliver ES that are relevant and valued by the Peel-Harvey society. Where it was not possible to identify measurable attributes of estuarine processes leading to key ES, proxy indicators were identified. The aim of the operationalized matrix is to assess estuary ecosystem service provision through providing a numerical measure of estuary health. The operational indicators will then be used for directing management decisions, through assessing changes in ES provision under various climate change scenarios. For this purpose, an innovative approach was employed, whereby historical patchy datasets were integrated with “virtual estuary data” created from 3D process-based modelling, in addition to ecosystem monitoring data collected in the field. The utilized approach will not only improve science communication through translating people’s views, but will also provide meaningful information targeted to decision – and policy – making contexts, across all sectors and at a range of spatial and temporal scales.