

A novel interdisciplinary approach to building system based environmental impact assessments for marine and aquatic environments

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Environmental Impact Assessments (EIAs) are designed to both evaluate environmental consequences and suggest means to mitigate possible impacts that may occur from development projects (infrastructure creation, urban expansion, offshore development, mining, etc.). The formal EIA process is critical to ensuring decision makers consider the environment prior to proceeding with a project. EIAs are used in almost every country in the world today; yet despite the important role they have in decision-making, there is little or no standardization in the practice. The process is essentially a qualitative exercise which does not take fully into account the complexity of ecosystems nor the true aggregate impacts. We suggest a new approach to EIA is necessary today to incorporate advances in ecosystem based modelling, hydrodynamic modelling and survey technologies made over the last two decades. To achieve this, we are examining three different aspects:

1. Developing a screening or scoping framework for system based environmental impact assessment (J.Edmunds);
2. Using a system based hydrodynamic modeling approach to predict environmental responses in coastal systems (J.Wilson); and
3. Using remote sensing and ground truthing to optimize nearshore environmental survey methodologies (S.Hinz)

The goal is to be able to understand impact in terms of the interactions and functions attributable to ecosystem processes. This would replace the current focus on a receptor based approach which does not integrate the full picture of physical and biological processes nor does it allow effective evaluation of alternatives. The expected outcome of our work is a new methodology for full lifecycle assessment of environmental impacts which can be applied at any scale and at any phase of the EIA process.

Keywords: environmental impact assessment, ecosystem based modelling, hydrodynamic modelling, marine survey technology