

Describing the “Integrated” in Integrated Ecosystem Assessments

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Summary

Within the Theme Session: “One size does not fit all – what does an Integrated Ecosystem Assessment mean to YOU?”, multiple perspectives on, approaches to, and interpretations of an integrated ecosystem assessment (IEA) and its components as a key element and foundation for an ecosystem approach to management (EAM), will be presented and discussed. This submission by the session co-conveners will serve as an introductory and overview presentation, and will:

- 1) Examine the role of IEA in EAM.
- 2) Explore the relationship of “integrated” ecosystem assessments with and in contrast to more narrow thematic or sectoral assessments towards fully implemented EAM through IEA.

This analysis will consider several potential stages of integration, including human dimensions (socio-economic) aspects. We will consider the role of thematic and sector-based assessments within an integrated assessment and suggest an iterative process for IEA production and application towards full EAM.

Introduction

Integrated: “to make whole or complete by adding or bringing together parts; to put or bring (parts) together into a whole, unify” (Webster’s New World College Dictionary).

An ecosystem approach to management (EAM) is defined as “the comprehensive integrated management of human activities based on the best available scientific and traditional knowledge about the ecosystem and its dynamics, in order to identify and take action on influences which are critical to the health of marine ecosystems, thereby achieving sustainable use of ecosystem goods and services and maintenance of ecosystem integrity” (Skjoldal and Misund, 2008). While the concept of EAM has been around for some time, in recent years it has become more widely accepted by scientists and managers alike that there is a need to implement this comprehensive approach that provides a holistic and integrated framework to effectively and efficiently manage ocean and coastal ecosystems (Levin *et al.*, 2013; Skjoldal and Misund, 2008).

Though EAM is inherently science-based, above all it is a process to support and inform management decisions (Walther and Mollmann, 2013). A key component to achieving EAM is a structured framework for ecosystem assessment and evaluation relative to management objectives, and importantly one that evaluates potential trade-offs of alternate management actions. Integrated Ecosystem Assessment (IEA) provides just such a framework and is defined as “a formal synthesis and quantitative analysis of information on relevant natural and socioeconomic factors, in relation to specified ecosystem management objectives” (Levin *et al.*, 2013).

Discussion

IEA in its fully implemented form, as the analytical framework for EAM, is meant to be wholly integrated and multi-sectoral. Successful implementation of EAM through IEA should be iterative and incremental, hierarchical and adaptive, and build off of existing approaches and knowledge (Samhuri *et al.*, 2013). In fact, effective single-sector and/ or thematic approaches are likely a “prerequisite” to successfully achieve complete across-sector EAM, and progress will need to be an

evolution rather than a revolution (Bianchi *et al.*, 2008). With this in mind IEA can be seen as a “modular” build-up of existing single-sector or thematic-based assessments (e.g. species or habitat status, single or multiple species stock, shipping, energy, eutrophication, environmental impact) or even as a continuum along a spectrum of levels of integration of assessment. For example, one could consider this spectrum to have three main pillars (Agardy *et al.*, 2011):

- 1) No to Low EAM: e.g. Manage individual species or single sector; restricted scale; short-term outlook (e.g., 1yr); manages goods
- 2) Incremental EAM: e.g. Manage groups of species or integrated management of two sectors; medium-term outlook (e.g., 5yr); manages activities with goods in mind
- 3) Comprehensive/ Complete EAM: e.g. Manage whole ecosystems or integrates across all sectors; long-term outlook (e.g., 20yr); manages activities with system function in mind

Additionally, one might consider the evolution or continuum of EAM and IEA in two complementary dimensions: vertically within a sector and horizontally across sectors (the latter being the truly holistic approach) (Bianchi *et al.*, 2008).

Conclusions

As Link and Browman (2013) state, “For all ocean use sectors, integrated ecosystem assessments are the most appropriate tool.” While IEAs can, should, and will meet the needs of today’s sector-based ocean management, we will need to be vigilant to keep site of the longer-term vision and goal of EAM. A key strength of the IEA is that it is flexible and adaptive enough to support the more near-term single-sector marine resource mandate and assessment needs as currently defined. It also, by design and definition, has the capacity and depth to provide the structure for a fully integrated, multi-sector ecosystem approach to management. As will be seen from the various contributions in this ICES theme session, implementation of IEAs at one point of the EAM continuum or another is already in progress in many countries, and globally. Thus, as the knowledge-base grows and lessons are learned and shared, IEAs will serve a pivotal role and as a fundamental framework to actively evolve along the management continuum and take EAM from concept to reality.

References

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