ICES Theme Session C

One Size Does Not Fit All – What Does an Integrated Ecosystem Assessment Mean to YOU?

Conveners: Rebecca Shuford, [rebecca.shuford@noaa.gov](mailto:rebecca.shuford@noaa.gov) (USA), Hein Rune Skjoldal; [hein.rune.skjoldal@imr.no](mailto:hein.rune.skjoldal@imr.no) (Norway), M. Robin Anderson: [m.robin.anderson@dfo-mpo.gc.ca](mailto:m.robin.anderson@dfo-mpo.gc.ca) (Canada)

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).

A principle objective of the ecosystem approach to management (EAM) is to maintain an ecosystem and its components in a good state or condition and to sustain human well-being. A core element and mechanism to achieve EAM and its objective(s) is Integrated Ecosystem Assessment (IEA). However, when it comes to conducting an IEA, one size does not fit all. That is to say there are multiple perspectives on, for example, how to define an IEA; what it means to develop and implement an IEA; what elements need to be included in an IEA; the scope (geographic and/ or disciplines) of an IEA; who needs to be involved in an IEA; and what governance structures guide an IEA.

*Integrated ecosystem assessments are the critical link between ecosystem science and advice to policy and ecosystem-based management.* This point was repeated by many of the contributors to this theme session. A wide range of excellent presentations led to lively discussions. Some themes that were touched upon by many of the speakers within the topic of “What does an Integrated Ecosystem Assessment mean to YOU?” include:

* While in general there is common ground that IEA is an approach to achieve more comprehensive management in an ecosystem context, IEA does mean different things to different people. Integration can occur at many levels (e.g. from single species assessments that integrate the environmental context, to multispecies assessments that can be incorporated with ecosystem assessments, to full multi-sectoral ecosystem assessments) and on many spatial scales (e.g. from local to Large Marine Ecosystems) and along a continuum between these levels and scales.
* Management targets and objectives should frame and guide the appropriate level and scale of the assessment. The application of IEA to EAM should be scaled to meet the needs of management systems and be based on the ecological processes and components, human dimensions, and jurisdictional boundaries that influence achieving the objectives and the scope of the assessment. As such IEAs will look different as driven by differences in ecosystems, political, cultural, and societal needs.
* While producing comprehensive information in an IEA for EAM is challenging, perhaps more challenging is transferring this information into practical management use. Policy needs to be founded on sound science to be deliverable, and the scope of management objectives is determined by the policy world. Thus, setting objectives should be grounded in sound science. This is where science and policy need to work together; and emphasis should be on whether or not we are gaining or losing ground on the objectives. IEAs support all aspects of this and provide the means to get ecosystem science into advice. To this end there are three reasons for conducting an IEA: describing what is happening in an ecosystem (e.g. status and trends); supporting decision-makers and advising policy, including setting concrete objectives; and monitoring and reporting on how well those objectives are being met (i.e. how are we doing?).
* Within an IEA, we need to distill a large amount of complex information into something transparent and useful, and this is a challenge. While it is difficult, it is not new – we are used to it and can deliver. There are numerous tools and approaches available to for example show trade-offs, consequences, and management implications (e.g. management strategy evaluation) and to provide more synthetic measures of risk and performance (e.g. to synthesize multiple objectives). It is important to tailor communication to the audience and to encourage iteration and engagement.
* Sectoral IEAs or elements of an ecosystem approach applied within sectors are being done; first steps towards EAM. However, integration across sectors is still limited. While assessments and advice may still mainly be single species or sector, many presentations shared approaches that are working to integrate towards IEA, starting within their sectors. Such contributions included examples from multi-species stock assessments working to bring in ecosystem information, the offshore energy sector and environmental impact assessments, marine spatial planning in the coastal zone, and development of integrated ecosystem management plans and/ or ecosystem overviews for several major seas.
* Human Dimensions need to be included as a component of EAM and IEA. And this should occur early, not as an after-thought. There needs to be co-production of policy and science, not science to policy. We need to be thinking about EAM as a coupled socio-economic system - think about the drivers and pressures, human activities, as well as the institutions and governance. These are all part of the human dimensions. We should be driven towards human wellbeing which is itself composed of a variety of connections, capabilities and conditions. Further it was discussed that society needs to be embedded into the exercise of scoping and defining what we want and what is a “healthy ecosystem”; stakeholders need to be involved as soon as possible (and this is one way that social scientists can help). However it was clearly articulated that social science is more than just engagement; social science is immensely diverse and there are many ways social scientists can contribute.
* A key to successful and truly integrated ecosystem assessment is to remove the boundaries between different sources of knowledge, particularly between physical, chemical, biological and socio-economic sciences, as well as ultimately between management sectors. Some challenges for implementing IEA that were identified include data limitations, model complexity, matching IEA with management requirements, and stakeholder “mistrust”. Additional challenges include defining “ecosystem” objectives, a construct or ability to work seamlessly across sectors, and a way to package and translate more complex science information into products and advice that managers can use (and feel confident in). However, despite some of the current challenges, most believe that IEAs will continue to be applied more often in the years to come.
* Importantly, EAM is as much a process or “journey” as a product or endpoint and IEA should be incremental, iterative and scalable to support this process. Progress towards EAM, and IEA as an analytical tool to achieve EAM, is a continuum and will evolve along a spectrum of levels of integration of assessment: from no EAM, to incremental EAM, to comprehensive EAM. Additionally, IEA will need to build off of existing thematic or sector assessment components. Many of the presentations focussed on integrating components of a full IEA and demonstrated that implementation of IEAs at one point or another along the EAM continuum is already in progress. As we continue to learn and share our best practices, IEAs will serve as a fundamental framework to actively evolve along the management continuum towards full EAM.
* IEA delivers a great opportunity to overcome the challenges to EAM and to achieve integration and ultimately full EAM. A key strength of IEA is that it is flexible and adaptive enough to support the more traditional and near-term single-sector resource and management needs as currently defined, but by design and definition it has the capability to provide the structure for the longer-term goal of fully integrated, multi-sector EAM.

Several questions emerged during the session that provide useful food for thought as we move forward with IEAs:

1. What will ICES do with the IEAs that will be produced by the Regional Seas working groups?
2. How do we balance quantitative and qualitative data vs expert opinion?
3. How should the public be involved in the process?
4. How should [ICES] engage stakeholders in the process?
5. Are socio-economists “prepared” to address EAM and how do we bring them into the IEA process?
6. How much integration is needed before we call it an IEA?
7. How do we achieve more integrated analysis across components and sectors within an ecosystem; across spatial, temporal, and political/ institutional scales?
8. What is the role of institutional/ governance structures in terms of achieving EAM (through IEA)?