THE SKIMMER ON MARINE ECOSYSTEMS AND MANAGEMENT

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Experts Describe Challenges Facing Marine EBM

Ecosystem-based management (EBM) is gaining acceptance around the world as a more holistic approach toward coastal and marine resource management. At the same time, agreement on the scope and implications of EBM remains elusive. We asked selected experts for their views on the challenges facing the EBM field:

EBM as a buzzword

By Tundi Agardy, Executive Director, Sound Seas, Bethesda, Maryland, U.S.
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We've made great advances in marine management. This has been along a trajectory that began with management of single stocks as if they were agricultural crops, and has progressed toward recognition of the dynamics of marine ecosystems and attempts at thinking at ever-larger scales and acting in ways that are not merely replicas of the way we manage lands. Having said that, I think we in the marine management/conservation community have over-exaggerated the progress we've made toward true EBM. In most cases, EBM is merely a buzzword - and it hasn't moved too far beyond the state we were in 15 years ago, when I remarked that ecosystem management was like the joke that everybody laughs at but nobody really gets.

So I'd ask: "What is EBM?" To that, I'd answer that EBM is first and foremost a recognition of connections - quite obviously the connectivity between different components in large-scale marine ecosystems, but also the connections between land, freshwater and the sea, and the very real but oft-ignored connections between human well-being and marine-ecosystem condition. We've gotten better at recognizing the connections in the first way of looking at it, but we're still dismally bad at the latter two.

In my opinion, CCAMLR [Convention on the Conservation of Antarctic Marine Living Resources] remains the best example of a framework that gets us toward true EBM. But the Antarctica case is, of course, unique where neither the freshwater/terrestrial connections nor the human ones apply. I also believe multiple-use zoned MPAs can move us toward EBM if the scales are appropriate and management measures are tailored to address the real threats to ecosystem productivity and health. But I think we'll make a significant leap toward EBM if and when we are able to manage strategically at the regional scale using complementary ocean and coastal/watershed zoning. Therefore, the greatest challenges will be to highlight those broader connections, scale up management to scales appropriate to these vast, interconnected ecosystems, and bring communities of fisheries managers, coastal managers, tourism operators, developers, community leaders, etc., together to articulate common goals and work toward them - ignoring uncertainties and bravely experimenting with new ways of managing ourselves and our impacts.

Progress at a slow pace

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EBM is still in the conceptualization, modeling and experimentation stage. There are a number of ongoing efforts - at the level of research, modeling and practical management in universities, research institutions, among government and non-governmental organizations - to find ways and means of implementing EBM. Progress is being made, but only slowly.

A key challenge stems from the fact that ecosystems are geographically specified, with the implication that many of the world's 64 large marine ecosystems are shared by two or more countries. This means that policies that are transboundary in nature are required to manage them successfully. For example, to effectively apply EBM to the management of the Benguela Current Large Marine Ecosystem in the Southeast Atlantic Ocean, policies need to be crafted and adopted by the three countries bordering the ecosystem - namely Angola, Namibia and South Africa. In terms of policy, getting countries with diverse societal objectives to agree on and implement joint EBM regimes is certain to be a challenge that must be addressed if EBM is to gain universal applicability.

To know EBM has been successful, I will need to see joint management institutions put in place by countries sharing a given ecosystem. These institutions should be given the authority, responsibility and mandate, by the relevant countries, to manage the ecosystem using EBM. Given the insurance value of marine protected areas, and their ability to protect slow-growing fish from market forces as dictated by market interest rates, any EBM system that hopes to be successful in ensuring the long-term sustainability of marine resources will have to include them in their management toolkit.

A need for implementation clarity

By Francisco Arreguin-Sanchez, Senior Professor, Center of Interdisciplinary Marine Sciences, Polytechnic Institute, La Paz, Baja California, Mexico.
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EBM has been adopted as a concept by governments in most Latin American countries - which also have adopted the Code of Conduct for Responsible Fishing and which recognize the necessity of sustainable use of ecosystems.

However, it appears to be unclear how it can be implemented. Most countries practice a top-down management scheme with institutional arrangement focused on single-species administration and an ad hoc decision-making process. Fisheries scientists explore the EBM testing hypothesis under modeling and simulation experiments, fitting models to observed data and trying to provide realistic scenarios focused on particular problems.

Currently, when such EBM approaches are considered, associated knowledge about ecosystems (i.e., interdependences between species or climate drivers) is considered as a framework within which single-stock decisions are made. Even when this approach is better than single-stock-based management, EBM is not really implemented.

The main challenge here is that institutional arrangements must change at least in their operative form to permit multiple decisions even if they are of a different nature - i.e., fishing and conservation, or decisions over two or more fisheries at the same time.Currently institutions do not have this ability. In contrast, there are a few examples in which a bottom-up or mixed-decision process appears to be a good approach to EBM because shared responsibility for resource management implies an ecosystem perspective to maintain local economies. Unfortunately, social constraints (i.e., equity vs. sharing criteria) make this process difficult.

Solving three EBM riddles

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I think the basic challenges of EBM are similar all over the world. Here are three general EBM "riddles":

1. How can we reconcile holistic generalists with detailed specialists? Ecosystems are multi-faceted, and no one person can be expected to integrate all current knowledge. Thus, we find ourselves with a few generalists (who know a bit about most things but not much about any one thing) and a lot of specialists (who know little or nothing about most things but know a lot about one thing). Imagine these people gathered in a room: A few generalists stand at the front with many specialists invited as participants in this "EBM workshop". A generalist begins with an overview of the ecosystem. It soon becomes apparent that every specialist in the room is unhappy with the generalizations, and perhaps errors, the generalists have made. Each of the specialists leaves the room shaking her or his head in frustration that this meeting has been a waste of time, though each has a different reason why. How can the generalists convince the specialists otherwise?

2. Can traditional incremental improvement apply a new paradigm such as EBM? This issue is related to the one above but looks at it through an institutional lens. To date, institutions generally have developed credibility and trustworthy results through incremental improvement. This particularly is true of governmental bodies, which tend to attract correspondingly detail-oriented, careful, methodical individuals often with a sense of civic responsibility to maintain existing order. But the question has not yet been answered: Can EBM be implemented incrementally? If so, what are the steps?

3. Can the implementation gap be closed or do we require a re-thinking of what is necessary? The gap between what is required and what usually is available to implement EBM appears to be widening. Recommendations regarding indices, methodologies and planning processes typically are becoming more data-intensive, analytically sophisticated, and broad. While our attention remains focused on addressing problems that already have a long history (such as fisheries allocations or coastal eutrophication), new environmental issues (such as genetic truncation in fisheries, ocean acidification or climate change) are rapidly emerging and threaten to outstrip our institutional ability to respond. Is all this complication necessary to EBM? Or can we still make good decisions using simpler heuristics? Is our pursuit of the ideal EBM process blinding us to simpler, but still good, solutions? I would suggest that openly discussing these EBM riddles is preferable to wishing them away.

My hunch is that the answer to riddle #1 hinges around research funding (i.e., that specialist funding is preferentially given to research that can aid in addressing EBM questions). My answer to riddle #2 is a qualified yes, given that a multi-departmental approach can be achieved as an intermediate step (i.e., fisheries and environment directorates must begin working together - and, if this is not possible, then more dramatic institutional restructuring may be called for). For riddle #3, I believe much simpler approaches are possible and just as likely, if not more so, to be successful.
