

Connecting the many scales of marine EBM

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Key Points

- EBM must be implemented at the multiple spatial and temporal scales that reflect the natural hierarchical organization of ecosystems (e.g. From large marine ecosystems such as the California Current to small estuaries such as Morro Bay).
- Effectively integrating the organizational structure of science, management, and stakeholder involvement across different scales is fundamental to successful marine EBM.
- Local EBM efforts are often bottom-up initiatives with great stakeholder involvement but are limited to focusing on small scale issues specific to a place.
- Large EBM efforts are often top-down (government initiated) efforts with the ability to tackle a broader range of environmental issues but often without the ability to connect with local activists.
- EBM efforts need to integrate their activities across scales so that top-down policy efforts result in actions at the level where people live and work in ecosystems.
- Current sectoral governance requires that we develop interim programs that enable cross-sector management at multiple scales.
- Interim programs are easily established locally by bringing together managers, scientists, and stakeholders into integrated ecosystem groups that reflect natural ecosystems (watersheds, bay/estuary, open coasts).
- We suggest there is a critical need to formalize connections between local and larger scale efforts so that management activities reflect the natural hierarchy of ecosystems.

Article

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Ecosystem-based management (EBM) is by its very nature about interactions: those between land and sea, people and the environment; among stakeholders, managers, and scientists; and among different spatial and temporal scales. Recent scientific findings demonstrate that the ocean and coastal processes we depend upon for services such as provisioning of food and protection from storms are linked to natural variability and influenced by human activities over many spatial and temporal scales. To ensure that we have healthy oceans into the future, we must manage at the multiple scales reflected in the natural organization of ecosystems. We need to develop flexible responsive management structures that link local management, scientific understanding, and stakeholder interests to regional and national management while maintaining the ability to respond rapidly and endure for decades. Fortunately, there are examples of EBM efforts at different scales around the world. While many of these efforts are young and are only

doing pieces of EBM, we can identify successful implementation strategies at different scales and use this knowledge as a basic for connecting management across scales.

Local scales are where people connect with ecosystems. It is where people “feel” the effect of management. Thus, EBM must have a presence at local scales and indeed, local-scale EBM is often a bottom-up (stakeholder driven) effort to create a forum for communication among management agencies, scientists, and the community. Such programs focus on finding solutions to local issues and better managing resources in a particular location. The conundrum is that place-based efforts usually do not have legal authority to change management regulations. Moreover, smaller scales are necessarily impacted by ecological and political events occurring at larger scales. If small scale efforts are to be effective they must connect to larger scale activities.

Larger EBM efforts tend to be top-down (government organized) policy efforts. EBM language is incorporated into legal documents, agency mandates, or multi-party agreements providing mechanisms for cross-agency communication, common overarching goals, and action plans to achieve those goals. However, these policy efforts are often without a roadmap for how to implement EBM at small scales leaving local managers wondering how to interpret policy language or find resources to realize needed changes. There is a disconnect between these two efforts because governance structures are not built to connect different sectors of human uses or able to integrate between large and small efforts. Thus a “marine EBM paradox” exists that can only be resolved if EBM efforts integrate their activities across scales.

We need top-down policy efforts to result in on the ground actions at the level where people live and work in ecosystems. The creation of nested management bodies might achieve this. These bodies would bring together managers, scientists, and stakeholders into integrated ecosystem groups that reflect the natural organization of local ecosystems (e.g. local watersheds, bays, and estuary), regional ecosystems (e.g. reef systems, large watersheds, stretches of open coasts between headlands), or larger ecosystem (e.g. Large Marine Ecosystem). These groups would have the regulatory authority to address environmental issues at the appropriate scale and would be connected with one another so that cross-scale issues could be tackled consistently.

Policy directives and local implementation efforts are disconnected. The current fragmented sector-by-sector governance structure requires that we develop interim programs that enable cross-sector management at multiple scales. Nested sets of integrated ecosystem groups might offer one mechanism to achieve this integration. For ecosystem-based management to move from theory to practice we suggest that there is a critical need to formalize links between local and larger scale efforts so that management activities reflect the natural hierarchy of ecosystems.

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