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Examining the Relationship between Marine Spatial Planning and EBM: Views from Three Planners

In the field of marine resource management, two concepts have received particular attention in recent years: ecosystem-based management (EBM) and marine spatial planning (MSP). Examples of these concepts in practice are emerging around the world. However, the distinction between the two often remains unclear to stakeholders, as well as to many resource managers responsible for implementing one or both concepts. In a November 2009 webinar on marine spatial planning (co-presented by MEAM and the EBM Tools Network — see box, page 2), more than one audience member asked whether EBM and MSP were essentially the same thing.

The concepts are not the same, but they are related. For insights on that relationship, MEAM asked three practitioners who have instituted marine spatial plans to comment. In short, we wanted to know what role EBM played in their spatial planning work.

Massachusetts: “MSP will be more effective to the extent that it incorporates EBM”

The US state of Massachusetts released a spatial management plan for its marine waters in December 2009. The plan aims to balance environmental protection with sustainable use, in part through a zoning system that ranges from strict protection to multi-use (see page 7, “Massachusetts releases ocean management plan”). Deerin Babb-Brott, Massachusetts’ assistant secretary for ocean and coastal zone management, managed the planning process. “The plan sets Massachusetts on a path toward comprehensive ecosystem-based ocean management,” he says.

The Massachusetts state law that mandated creation of such a plan required it to be ecosystem-based. Babb-Brott says one of the first challenges he faced was determining, for internal guidance, what was meant by “marine spatial planning” and “ecosystem-based management”.

“We reviewed many definitions and applications of EBM and MSP,” he says. Eventually his team settled on definitions adopted from the *Scientific Consensus Statement on Marine Ecosystem-Based Management*

(for the EBM definition) and UNESCO (for the MSP definition) — “based on their intuitive simplicity,” he says. The definitions were as follows:

“[EBM is] an integrated approach to management that considers the entire ecosystem, including humans. The goal of ecosystem-based management is to maintain an ecosystem in a healthy, productive and resilient condition so that it can provide the services humans want and need. Ecosystem-based management differs from current approaches that usually focus on a single species, sector, activity or concern; it considers the cumulative impacts of different sectors.” [This definition is at www.compassonline.org/pdf_files/EBM_Consensus_Statement_v12.pdf.]

“[MSP] is the adaptive process of collecting, analyzing and managing the spatial distribution of marine resources and habitats and human activities to achieve the goals defined by society. Not unlike what we regularly do on land in terms of zoning and land-use planning to site development while protecting such features as open space, habitat, and drinking water supplies, marine spatial planning seeks to do the same in the ocean environment.”

Babb-Brott says that no matter what kind of ocean management system an authority has in place — MSP, EBM, or otherwise — it will always include (a) some degree of protection for critical resources and systems and (b) accommodation of some set of human activities. “Our ability to manage human impacts to natural systems requires an understanding of those systems themselves,” he says. “Therefore, marine spatial planning will be more effective to the extent it incorporates principles and practices of ecosystem-based management.”

In developing the ocean plan, Babb-Brott’s team developed a tool for characterizing areas of relative ecological significance — i.e., sites with “special, sensitive, or unique” estuarine and marine life and habitats. They called the tool the Ecological Valuation Index (EVI) and based it on work from Europe (the Belgian North Sea) and Canada (the

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Scotian Shelf). An explanation of the EVI is at http://commpres.env.state.ma.us/mop/draft_plan/v2/draft-v2-evi.pdf.

“In the end, while we were not able to formally incorporate the EVI as a basis for decision-making, we used information from it as the basis for regulatory maps that allow or disallow development relative to specific resource areas,” says Babb-Brott. “Consideration of the EVI was important because it required us to evaluate available science and our understanding of the ecosystem. We also had to determine whether, and how, potential management measures could be substantiated by our current knowledge.”

The Massachusetts Ocean Management Plan is available at <http://bit.ly/8ZidO3>.


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Webinar excerpt: Does marine spatial planning have to be ecosystem-based?

On 17 November 2009, MEAM and the EBM Tools Network co-presented a 90-minute webinar on marine spatial planning. The event featured Bud Ehler and Fanny Douvère, co-authors of the guidebook *Marine Spatial Planning: A Step-by-Step Approach toward Ecosystem-Based Management*. A video recording and transcript of the webinar can be downloaded at www.ebmtools.org/about_ebm/meam.html. (Recordings and transcripts of previous MEAM webinars are also available there.)

In the excerpt below, Bud Ehler responds to a question on whether marine spatial planning (MSP) must be implemented in an ecosystem-based way to be effective — even in cases where the main uses of a particular ocean area are purely industrial, such as shipping, oil drilling, or offshore wind farms. Ehler said:

“We strongly advocate that marine spatial planning is an ecosystem-based approach. No matter what kinds of activities are carried out in a particular area, they are going to have an effect on the ecosystem services that are provided by that area. And no matter how small or large [a marine area is], there are ecosystem services that it provides. It is particularly important that those natural services are considered — that an attempt is made to maintain and to sustain those services that are critical in terms of not only the ecosystem but also the economy of marine areas.

“To add one point to that, a very important first step in any marine spatial planning process is the identification of biologically and ecologically significant areas. That is the basis for spatial planning. When you decide to create a wind farm or an oil and gas development area, the cumulative impacts on these ecologically and biologically important areas are considered and very well documented in MSP processes.” 

Norway: An “integrated EBM plan” that amounts to MSP

In 2006, Norway established an “integrated, ecosystem-based management plan” for its Barents Sea waters. The plan’s stated purpose was to provide a framework for sustainable use of natural resources derived from the Barents Sea while maintaining the structure, functioning, and productivity of the sea’s ecosystems.

The plan — available at <http://bit.ly/dAi1nt> — does not use the term “marine spatial management”. However, that is basically what the plan amounts to, says Erik Olsen, head of the research program on oil and fish at Norway’s Institute of Marine Research. “The Barents Sea Plan — in addition to Norway’s integrated management plan for the Norwegian Sea — are spatial management plans, especially in regards to allocating space for the petroleum industry and shipping lanes,” says Olsen. “These plans incorporate many of the aspects of what is considered good practice on MSP.”

The ecosystem-based elements of the Barents Sea plan are readily apparent. The plan assesses pressures and impacts on the environment, recommends measures to reduce pollution and safeguard biodiversity, and sets up a system for monitoring the state of the ecosystem, among other actions.

“At present the Barents Sea plan provides good protection for the most valuable ecosystem components and areas,” says Olsen. “These are now off-limits to the petroleum industry. But the industry is pushing strongly to gain access after the revision of the plan later this year [2010].” The plan is scheduled to be revised every four years. Regarding that process, Olsen says that although government priorities — and the plan itself — may naturally change over time, the ecosystem-based aspects of the plan should be long-lasting.

“Such planning serves several long-term purposes that cannot be overlooked once they are in place, irrespective of changing governments,” he says. “These include identification and setting of value to areas and ecosystem components; analysis of vulnerability in relation to external pressures; and analysis of cumulative impacts. The integrated analysis and identification form a new baseline for all management.”

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Germany: Sustainable spatial development, but not EBM


Germany has three spatial management plans for its part of the Baltic Sea. One plan covers the Exclusive Economic Zone and was established by the federal government. The two other plans cover state waters out to 12 statute miles from shore, and were established by their respective states in northern Germany: Schleswig-Holstein and Mecklenburg-Vorpommern.

The Spatial Development Programme for Mecklenburg-Vorpommern covers the state's land and coastal waters together. The marine portion of it is designed to reduce conflicting demands of new technologies (namely offshore wind energy sites), tourism, nature protection, and traditional sectors like shipping, fishing, and defence. Susan Toben of the state ministry responsible for regional development says the plan's guiding principle is "sustainable spatial management": i.e., bringing the state's social and economic needs into harmony with its ecological functions. The goal is long-term, large-scale, and balanced spatial development.

Toben draws a distinction between this and ecosystem-based management. In her interpretation of the concept, the ecosystem-based approach gives primacy to ecological demands. "Our spatial planning has to balance the environmental, economic, and social aspects of sustainability, and it has to secure development potential for future uses," she says. "Social and economic demands are of the same value as ecological demands."

However, Toben notes that ecosystem considerations still play an important role in the Spatial Development Programme. Substantial areas in the coastal zone, for example, have been set aside for nature protection. "Our priority areas and reserve areas for nature protection and management are vital for maintaining open spaces," she says. In the priority areas, which are zoned specifically for nature protection, all conflicting uses are prohibited. In the reserve areas, decisions on whether to allow conflicting uses are made on a case-by-case basis. Such uses may be permitted if a comparative evaluation demonstrates their relative socio-economic significance and a lack of acceptable alternatives.

"These examples show that ecosystem-based aspects have been incorporated," says Toben. "But the overall basis for the spatial development plan is the principle of sustainable spatial development."

The text of the Mecklenburg-Vorpommern plan is available at http://service.mvnet.de/_php/download.php?datei_id=1689. The language is German, although the plan also includes a short English summary. A map is at <http://bit.ly/bbsRZm>. 

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Course available on geotools for marine spatial planning

In August 2010, a six-day course on the use of geotechnologies in marine spatial planning — such as remote sensing, tracking technologies, and global positioning systems — will be held in the Azores Islands, Portugal. Organized by the Geographical Information & Territorial Planning Centre at the University of the Azores, the course will be held from 7-12 August and will feature lecturers from Spain, Germany, the UK, the US, and Portugal. For more information on the course, go to www.gislands.org.

A spectrum of marine spatial planning

MEAM views both ecosystem-based management and marine spatial planning as a process or journey rather than an endpoint. That journey involves a spectrum of effort. In the case of marine spatial planning, this ranges from little or no MSP in practice (the status quo in many places)...to incremental MSP (spatial planning for some uses of the marine environment but not others)...to comprehensive MSP that covers all relevant uses. The MSP spectrum might appear as follows:

Little or no MSP

Example: A minor degree of spatial planning is in place, perhaps in the form of a small marine protected area or a port. But there is no systematic effort to plan the use of the marine environment, balancing trade-offs among a range of sectors and needs.

Incremental MSP

Example: This could be a spatial plan that addresses offshore energy production and shipping lanes but does not yet cover other existing uses, such as commercial fishing. Incidentally, this is the case for the Massachusetts Ocean Management Plan and Norway's Barents Sea Plan. Although management in these cases has not addressed all uses, spatial trade-offs among sectors have been considered and MSP is being practiced.

Comprehensive MSP

Example: In this case, the spatial plan addresses all uses of the marine environment in a particular area, including potential future uses and conditions.



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Research Spotlight: Managing the Costs and Benefits of Multinational Conservation

Conservation programs are often carried out at national or sub-national scales, despite the fact that many ecosystems and species cross international boundaries. One reason is that developing conservation plans at the multinational scale can present additional challenges: more meetings, more stakeholders with input, and more cultures to consider in negotiations.

A study in the September 8, 2009, issue of the journal *Proceedings of the National Academy of Sciences* concluded that the overall cost of conservation could be reduced if there were greater cooperation at the multinational level, with transboundary species conservation as the target. Using the Mediterranean Basin as a case, the research team compared three scenarios for conserving vertebrate species in terrestrial and freshwater environments:

- Have each of the basin's 20 countries adopt its own conservation strategy for those species, namely through designation of protected areas;
- Have all 20 countries coordinate their conservation efforts to achieve a target level of conservation for the lowest cost, as measured by the cost of acquiring space for protected areas; or
- Have only the EU member nations within the Basin coordinate their plans, and leave the remaining countries to adopt their own strategies.

In the scenarios that featured coordination, countries where it was cheaper to designate protected areas would have more of them. The research team, led by Salit Kark of the Hebrew University of Jerusalem, concluded that the cost of fully coordinated conservation — scenario B — would be 45% lower than an uncoordinated plan (scenario A).

But is it that simple? In a separate commentary in the same journal issue, Rob McDonald of The Nature Conservancy wrote that although cooperative conservation was a worthy goal, there were still many challenges associated with it. Kark and her colleagues acknowledged these challenges as well. Below, MEAM talks with Kark and McDonald about the costs and benefits of multinational conservation.

MEAM: Dr. Kark, your study examined protection for amphibians, reptiles, and freshwater fish endemic to the Mediterranean. Do you suspect your findings would apply as much to marine and coastal conservation planning as they did to the terrestrial and freshwater planning in your study?

Kark: Definitely. We are now working on a similar analysis for the marine environment in the Mediterranean Sea. Because marine systems are naturally connected among countries, I assume the effect of collaboration will be even stronger there.

MEAM: Your study focuses primarily on the efficiencies gained by coordinated conservation, namely in terms of money saved and less area having to be set aside for protection. But you also mentioned there are limits to this cooperation.

Kark: There are indeed several limitations, and the disadvantages need to be traded off against the increased efficiency in area and cost. Because less area is required per country to reach the same conservation targets for a given cost, the coordinated strategy may actually encourage countries to spend fewer conservation dollars locally or to devote less area for conservation. In addition, large-scale, top-down, and centralized decisions generate, in some cases, antagonism and apathy in local groups and individuals. International plans and treaties also take time and resources and have additional transaction costs related to large-scale planning and communication that are difficult to quantify.

MEAM: Dr. McDonald, you pointed out some of the same challenges associated with coordinated conservation. Would you say those challenges apply equally to the marine environment?

McDonald: Yes. Anytime you increase the number of interest groups involved in a negotiation, it gets harder. And certainly most marine and coastal spatial planning is a negotiation among different interest groups. This is not an argument against broad-scale collaboration, per se. It is just something to be aware of before embarking on a large-scale planning effort.

MEAM: Is your definition of collaborative or systematic planning synonymous with ecosystem-based management?

McDonald: It is not synonymous, although some of the issues I was talking about might also apply to ecosystem-based management. Systematic conservation planning is usually the first step in designing a conservation system, whereas EBM is the set of decisions that have to be made over time to maintain the biological integrity and ecological functioning of a site. That said, I think some of the things that make large-scale conservation planning difficult also make large-scale EBM difficult. Again, this does not mean it should not be done.

MEAM: Your organization, The Nature Conservancy, has programs worldwide. Would you say that its conservation planning efforts are centralized or decentralized?

McDonald: We do think often about the right scale at which to be doing conservation planning. We usually end up trying to find the right balance between completeness (the allure of doing large plans) and ease of completion (the allure of doing smaller plans that have fewer interest groups involved).

MEAM: Dr. Kark, would you call for a similar balance in conservation planning in general?

Kark: Our research team suggests that a strategy that brings together the advantages of coordinated

conservation planning across a region with the advantages resulting from local planning, involvement, and leadership may be useful, cost-efficient, and successful. From a biological perspective, for example, separate — rather than coordinated — decision-making can actually be useful in some cases. Given uncertainty about the importance of biodiversity conservation in many countries in the future, spreading the “political” risk for a species across different countries may be an objective in itself. Finding the right balance and scale of action will be important. **M**

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Tundi's Take: Balancing Centralization and Decentralization in Ocean Governance

By Tundi Agardy, Contributing Editor, MEAM (tundiagardy@earthlink.net)

Successful EBM relies on two seemingly contradictory things:

- 1) Integration of management activities across large geographic scales and between sectors; and
- 2) Planning that is participatory and responds to the special needs and circumstances of each place.

The contradiction is that the first requirement pushes governance in the direction of centralization, while the second is toward decentralization. The optimal condition for EBM strikes a balance between the two, bringing each to bear on different aspects of governance. One way of striking that balance is to establish a “nested hierarchy” of decision-making in resource management, and in allocation of access and use rights.

What does a nested hierarchy look like? At the highest level, centralized government provides leadership, creating a vision for EBM and communicating the need for it. This level of government interfaces with other high-level government agencies to negotiate international or global agreements, taking EBM to the most comprehensive scale possible. At the same time, centralized government can establish an overarching framework for how planning and execution of EBM will occur, setting up within-country regional councils that divest management to more localized government agencies.

At the narrower regional scale, management entities can determine the most appropriate planning processes for implementing the framework. It is here that decisions about goals and objectives for regional EBM can be made, and where processes for harnessing science and involving stakeholders can be set.

The local scale is where true participatory planning is feasible, with the engagement of as many stakeholder groups as possible. At this point, decision-making on EBM occurs as a response to local needs and in the context of local circumstances, including environmental conditions; socio-political, economic, and cultural considerations; and legal or legislative constraints. Here EBM planning can be considered decentralized – even though it results from a coordinated process that is led by centralized government.

Canada uses a nested hierarchy in its approach to EBM. The national government provides leadership and establishes broad policies, such as through the *Oceans Act*. It also partners with neighboring nations to implement international EBM policies, such as through the North American Commission on Environmental Cooperation (which, for example, has endorsed a nested hierarchy for planning a North American network of MPAs — <http://bit.ly/9UHP6>). The national government, in turn, has divided Canadian waters into 29 marine regions, which serve as frameworks for cooperative planning and management at the regional level. Within each marine region, priority conservation areas are selected. Finally, at the local level within such high-priority areas, many different stakeholders have come together to assess threats and explore the best possible approaches for addressing these threats. **M**

New Tool Provides a Roadmap toward Marine and Coastal EBM

A new Web-based tool exists to guide practitioners on moving EBM from concept to practice. Called the EBM Roadmap, its target audience is marine resource managers who already have some knowledge of EBM but need advice on implementing it. The EBM Roadmap is available at www.ebmtools.org/roadmap.html.

“In developing the Roadmap, we conducted focus groups with potential users and recognized the growing number of people who understand EBM conceptually but struggle with putting it into practice,” says Verna DeLauer of COMPASS (Communication Partnership for Science and the Sea — www.compassonline.org), a US-based partnership of universities and NGOs. DeLauer co-developed the Roadmap with Waterview Consulting (www.waterviewconsulting.com) and the EBM Tools Network (www.ebmtools.org).

The Roadmap outlines eight Core Elements — such as “adaptive management”, “ecosystem services”, and “cumulative impacts” — that should be considered

when building an EBM program. Then it directs users to existing case studies, tools, data sources, and additional readings that pertain to putting each element into practice. The Roadmap is intended to be updated over time, evolving to reflect developments in EBM. DeLauer speaks with MEAM about this new tool:

MEAM: In what ways is the Roadmap unique from other EBM guides?

DeLauer: The Roadmap distills the huge concept of EBM into a manageable amount of reading that most people can find time for. Part of its function is also to help managers see how their day-to-day work can contribute to EBM without necessarily involving huge systemic changes.

MEAM: In what ways do you anticipate the Roadmap could evolve?

DeLauer: We anticipate that it will be updated with new case studies, EBM tools, scientific papers, and other resources to reflect new developments in EBM. We would like to add more depth to the core elements, such as custom-written case studies that clearly illustrate how people have approached — or are grappling with — the core element in practice.

MEAM: Regarding those core elements, do you view EBM as an “either/or” thing: i.e., you either have all eight of the core elements in place or you are not doing EBM at all?

DeLauer: The Roadmap is meant to represent a spectrum between “no EBM” and “comprehensive EBM”. An EBM project should not be considered a failure if the eight core elements are not all in place. As the name of the EBM Roadmap suggests, EBM is more about the journey than the destination. Comprehensive EBM might be a rarity or an unachievable goal in certain contexts and given certain resources. In most cases, some of the core elements will be in place, other core elements will be in the works, and some core elements will not be addressed yet. In reality, the important question is how well the management is performing: in other words, how well are ecosystem services being maintained to meet societal goals? ■

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Letter to the Editor

Impacts of climate change on rainfall, and consequences for marine and coastal systems

Dear MEAM:

I am writing in response to “Tundi’s Take: Using Science to Plan for Climate Change” in your December 2009/January 2010 issue. For near-shore marine systems and estuaries, it is critical to understand the impacts of climate change on rainfall, both patterns and precipitation rates, and the consequences of changing freshwater flows and pollution loads into our marine and coastal systems. This will be another important area for science to provide understanding.

Here in South East Queensland, Australia, our increasing understanding of these impacts has allowed us to prioritize investment in rural and urban catchment management to improve the resilience of our coastal systems. Science has led this investment through developing spatial optimization tools for riparian restoration works; understanding the impacts of urban flows on aquatic ecosystem health; developing decision support tools to model catchment and receiving waters’ response to sediment and nutrient loads; and guiding the regional ambient and event monitoring of freshwater, estuarine and marine waterways.

This science then needs to be interpreted, synthesized and communicated effectively and in a timely way to managers. One of our main communication products is an annual report card on aquatic ecosystem health derived from the ambient monitoring program and released by our independent Scientific Expert Panel. For us, more effective management is achieved through strong linkages with our science community.

Diane Tarte

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Notes & News

In US, interim framework released for marine spatial planning

The US Interagency Ocean Policy Task Force released an interim framework in December 2009 that proposes guidance for a system of coastal and marine spatial planning in US waters. Under the framework, the planning would be carried out on a regional basis across nine regional planning areas. Each regional process would be facilitated by a federal interagency National Ocean Council, which would also certify that the resulting plans were consistent with national policy. Each regional plan would be developed cooperatively among federal, state, tribal, and local authorities. The interim framework is available at www.whitehouse.gov/administration/eop/ceq/initiatives/oceans/interim-framework.

The interim framework defines coastal and marine spatial planning as a “comprehensive, adaptive, integrated, ecosystem-based, and transparent spatial planning process, based on sound science.” Following its December release, the interim framework underwent a 60-day public review and comment period, ending 12 February 2010. Coastal and marine spatial planning is one of nine priority objectives proposed in an interim report released by the task force last September (MEAM 3:2).

In February 2010, a letter signed by 262 marine scientists urged US President Barack Obama to make conservation the foundation of the country’s eventual national marine policy. “A National Oceans Policy needs to direct federal agencies unambiguously to work together effectively to protect, maintain, and restore the diversity and productivity of America’s marine ecosystems as economic activities in our oceans expand,” states the letter, available at www.mcibi.org/what/what_pdfs/NOP_letter.pdf.

Massachusetts releases ocean plan

In December 2009, the US state of Massachusetts released its Ocean Management Plan, concluding an 18-month planning process. The plan provides new environmental protections for the state’s waters while setting standards for the development of offshore renewable energy and other uses. Massachusetts state waters extend 3 nm from shore.

“For the first time, the consideration of individual management actions will be informed by an understanding of the broader environmental and social context in which they occur,” says Ian Bowles, secretary of energy and environmental affairs for Massachusetts. The plan establishes three types of zones:

- Prohibited Area — in which a variety of uses, activities, and facilities are prohibited;
- Renewable Energy Areas — dedicated to the development of wind-, wave-, and tidal-generated energy; and
- Multi-Use Area — allowing most uses, including renewable energy installations. However, at locations with a specifically protected resource, such as seagrass or marine mammals, projects will be permitted only if their benefits to the public are judged to outweigh detriments to those resources. The Multi-Use Area covers roughly two-thirds of state waters.

“The plan guides necessary or desirable development like aquaculture, utility infrastructure, and renewable energy facilities to locations where impacts will be minimized, and provides clear regulatory guidance to development interests and permitting agencies alike,” says Bowles. The plan also prioritizes immediate and long-term data needs and establishes a funded program of study to address those needs.

A 2008 Massachusetts state law — the *Oceans Act* — mandated creation of the management plan. That law also requires that the plan be reassessed and updated at least once every five years. The Ocean Management Plan, including maps of the zones, is available at <http://bit.ly/8ZidO3>.

EBM Advice: On developing a marine spatial planning process

Ian Bowles, secretary of energy and environmental affairs for the US state of Massachusetts, recently oversaw development of an ocean management plan for his state (see article, left). Bowles offered the following advice to administrators elsewhere around the world who are considering developing their own marine spatial planning processes:

• Legislation provides guidance and speeds the planning process.

Massachusetts benefited from having keystone legislation — the 2008 *Oceans Act* — that established policy and guiding principles for ocean management, and set a hard deadline for completion of the plan. Notably the Act exempted commercial fishing from the jurisdiction of the ocean plan. Bowles says the exemption helped to achieve public consensus and avoid difficult discussions that could have slowed development of this first-generation ocean plan. “The *Oceans Act* allowed planners and stakeholders to move directly into constructive engagement and plan development,” he says.

• Public-private partnerships can provide services and funding.

The state-run planning process benefited from funding and technical support provided by the Massachusetts Ocean Partnership, an organization consisting of NGOs, fishing industry, energy developers, private consultants, government agencies, and academics (www.masscoastpartnership.org). “Partnership resources gave state planners access to research and management tools that would have otherwise been unavailable, and greatly enhanced the public participation program through web-broadcast public meetings, workshops, and social media,” says Bowles. “The key to [the state’s] working collaboratively with the Partnership was the careful articulation of the relationship in a memorandum of understanding, with responsibilities clearly communicated internally and to stakeholders.”

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“Ridges-to-reefs” network of protected areas to be established in Solomon Islands

In November 2009, local chiefs representing the 21,000 residents of the island of Choiseul in the Solomon Islands agreed to establish a network of terrestrial and marine protected areas extending from the island’s mountain ridges to its coral reefs. The chiefs also agreed to designate at least one terrestrial

protected area and one marine protected area in each of the island’s 12 administrative wards. The agreements were based on recommendations made by The Nature Conservancy. Choiseul is part of the Coral Triangle and is considered the most biodiverse island in the Solomon archipelago. For more information on the agreements, go to www.nature.org/wherework/asiapacific/solomonislands/features/choiseul.html.

Editor’s note: The goal of The EBM Toolbox is to promote awareness of tools for facilitating EBM processes. It is brought to you by the EBM Tools Network, a voluntary alliance of tool users, developers, and training providers.

The EBM Toolbox by Sarah Carr

Social science tools for ecosystem-based management

The Social Science Working Group of the EBM Tools Network recently surveyed the types of tools that could help EBM practitioners incorporate socio-economic considerations into their work. Some of the key types of tools they found and examples of these tools were:

For understanding communities:

- **Social science database tools** allow practitioners to access information about communities and generate summary reports. Example: STICS census mapping tool (<http://marineconomics.noaa.gov/socioeconomics>)
- **Social assessment tools** provide frameworks for analyzing and incorporating social information and identifying stakeholders. Examples: Surveys and questionnaires such as SOCAT (<http://bit.ly/424kEQ>)
- **Social network mapping tools** increase understanding of the relationships between people/groups, and also help to plan improvement of these relationships. Example: Social Network Analyzer (<http://bit.ly/bfodTN>)

For understanding human drivers of change and mitigating impacts:

- **Impact assessment tools** help identify future social and economic consequences of current or proposed actions. Example: CommunityViz (www.communityviz.org)
- **Decision analysis tools** help incorporate risk and uncertainty into decision making. Example: Netica (www.norsys.com)
- **Economic valuation tools** help put values (often monetary) on ecosystem goods and services. Example: Environmental Valuation Resource Inventory (www.evri.ca)

For managing adaptively:

- **Management strategy evaluation tools** facilitate incorporation of multiple objectives into planning and model tradeoffs in potential management plans. Example: InVitro (www.cmar.csiro.au/research/mse/invitro.htm)

Read the full survey at www.ebmtools.org/social-science-tools.html. Learn about other tools at www.smartgrowthtools.org/ebmtools and www.spatial.redlands.edu/toolsgallery.

(Sarah Carr is coordinator for the EBM Tools Network. Learn more about EBM tools and sign up for Network updates at www.ebmtools.org.)

Report: Balancing species-based management with ecosystem-based management

One challenge that managers often face in applying EBM occurs when they are already required to conserve particular focal species and habitats. In such cases, strategies for species-based management and for ecosystem-based management may not overlap perfectly. So how can managers balance the competing mandates? A new report published by the US National Oceanic and Atmospheric Administration examines this source of conflict, focusing on the Papahānaumokuākea Marine National Monument in the Northwestern Hawaiian Islands. There, resource managers are responsible for managing several focal resources, like the endangered Hawaiian monk seal, while also applying an EBM approach to the protected area as a whole. The report proposes a process to prioritize conservation and management efforts. The report *Reconciling Ecosystem-Based Management and Focal Resource Conservation in the Papahānaumokuākea Marine National Monument* is available at http://sanctuaries.noaa.gov/science/conservation/pdfs/ebm_pnmn.pdf.

Report available on MPAs, marine spatial planning in Nordic region

A new report presents lessons gathered from a 2006 meeting on the use of marine protected areas in marine spatial planning, with particular focus on the experience of Nordic countries. The meeting, funded by the Nordic Council of Ministers, brought together researchers, managers, and NGO and industry representatives from Denmark, Finland, Norway, and Sweden. The report *Marine Spatial Planning in the Nordic Region: Principles, Perspectives and Opportunities* summarizes concepts, describes planning tools, and offers several case studies. It is available at <http://bit.ly/bNo3hb>.

New forum on links between oceans, climate

A website was launched in December 2009 to explore the relationship between climate change and oceanic conditions, and inform marine resource management on mitigation and adaptation strategies. The Ocean-Climate Forum, produced by the World Ocean Observatory, is at www.oceanclimate.org.