

MARINE ECOSYSTEMS and Management

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Making EBM Accessible: Guide Offers User-Friendly Advice on Putting Marine and Coastal EBM into Practice

A new publication from the UN Environment Programme (UNEP) applies a reader-friendly approach to help countries and communities move toward ecosystem-based management of oceans and coasts. Drawing on practical experience and lessons from around the world, the guide serves as an introduction to EBM principles and applications, and provides an overview of the general phases involved. In addition to its text-based advice, the guide's multiple diagrams explain the core elements of EBM in a simple visual way, such as the concepts of cumulative impacts and managing for multiple objectives.

The 68-page publication *Taking Steps toward Marine and Coastal Ecosystem-Based Management: An Introductory Guide* emphasizes that EBM can be implemented incrementally rather than as one big push. Quotes from experienced EBM practitioners are sprinkled throughout, offering first-hand advice on planning and implementation.

The guide was co-authored by multiple individuals with ties to MEAM: Tundi Agardy (MEAM contributing editor), John Davis (MEAM editor-in-chief), and Kristin Sherwood (MEAM editorial board member), together with Ole Vestergaard of the Marine and Coastal Ecosystems Branch of UNEP's Division for Environmental Policy Implementation. Its principal target audience is practitioners in the UNEP Regional Seas Programme. However, the guide is also expected to be of help to a wider audience, including planners and decision-makers on all government levels and across multiple sectors — fisheries, transportation, tourism, environmental management, and more.

Explaining what EBM as a concept is fundamentally about

The authors see a need for simple information on ecosystem-based management, relatively free of the jargon that too often invades EBM discussions. Agardy cites a story illustrating this. "A couple of years ago, I gave a presentation on EBM to an audience of practitioners whom I knew had been directed to do EBM for quite some time," she says. "My very basic introduction to EBM was so elementary, I expected it to cover ground the audience had heard countless times before. But afterward, several people approached me to say it was the first time they really understood what EBM as a concept was fundamentally about."

"This guide is really a primer on EBM," says Richard Kenchington, an advisor to UNEP on marine management and governance. "It is intended to help people explore the issues and possible solutions for the problems they see in their marine areas. It is not a 'one-size-fits-all' or 'how-to' manual in the sense of providing a complete turnkey approach. The idea is to describe a menu from which people can identify approaches that should work in their situation, and follow on from there."

"An important message in this guide is that there are many different paths to EBM," says co-author Vestergaard. "The paths can build on and integrate existing management efforts across sectors, adding key EBM principles into broader planning and implementation processes."

UNEP will use the guide in future national and regional marine and coastal planning assistance, including training programs and pilot projects. The guide will also support related UNEP work such as ecosystem-based adaptation, the Green Economy (providing guidance on changing the ways that humans interact with ecosystems, with EBM playing a key role), and the Blue Carbon Initiative (highlighting the capacity of healthy coastal ecosystems to sequester carbon dioxide). ■

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The guide is available for free.

To download, go to: www.unep.org/publications

Click on *Taking Steps toward Marine and Coastal Ecosystem-Based Management: An Introductory Guide*, then look for the link to the PDF at the bottom.



Defining Ecosystems as an Initial Step in EBM: Experts Discuss the Challenges and Implications

A basic concept in ecosystem-based management is that, when managers make decisions, they will consider the full array of natural and human elements and interactions that make up an ecosystem. By that account, a necessary initial step in EBM is for managers to define what their target ecosystem is. Is it small, involving a single bay, for example — or is it really big, encompassing a large marine ecosystem that crosses national boundaries? Does it involve only marine habitats, or does it extend upland into watersheds to account for factors like agricultural runoff that impact downstream areas?

How the target ecosystem is defined carries implica-

tions. Importantly, it affects which activities must be managed and which communities need to be engaged. It can also be strategic. If the definition is historically oriented, for example, it can help guide management toward ecosystem conditions that existed in the past, such as prior to heavy exploitation. Likewise it can consider the future by taking into account how the target ecosystem may respond and adapt over time to climate change.

In this issue, MEAM asks a few experts for their guidance on defining ecosystems and how this affects management. Their responses are below.

A. Defining ecosystems at different scales

By Stacy Jupiter

Editor's note: Stacy Jupiter is director of the Wildlife Conservation Society (WCS) Fiji country program. WCS-Fiji and conservation partners assist management of ecosystems at a range of scales: from small locally-managed marine areas to the much larger Vatu-i-Ra Seascape area (encompassing thousands of square kilometers), as well as a "ridge-to-reef" management program that extends from mountain tops to coastal waters.

On defining ecosystems in Fiji:

For practical purposes, an ecosystem needs to be specified with appropriate boundaries in space and time for the goals and questions of a particular project or management initiative. Where the limits should be drawn depends largely on the scale of the research or management questions. If the project is focused on maintaining ecosystems, then the boundaries of a system to be managed must be big enough to include all the main processes affecting ecosystem stability at the largest scale, such as the dispersal ranges and movement patterns of the main component species, as well as the threats that impact both species and habitats.

In Fiji, while coastal and marine resource managers may be primarily concerned about mangrove, seagrass, and coral reef systems and the species they contain, we know that there is high mobility of species between marine and freshwater habitats. Research by Wetlands International-Oceania and WCS-Fiji has shown that greater than 98% of Fiji's fishes found in freshwater systems make contact with the sea at some stage in their lifecycle. These fish species are affected by disturbance throughout the length

of the catchment (e.g., from land clearing, dams, and gravel extraction). Therefore to manage for these fishes, it is imperative to manage along the length of the catchment from the headwaters of streams to the reefs. Similarly, if the main focus of the project is on reducing threats to coral reef ecosystems from land-based runoff, the system under management should be bounded by the geographic range that includes both the source of the runoff and the area over which freshwater and suspended sediments are distributed in the nearshore.

Implementing these management initiatives in Fiji and many of the Pacific Islands is greatly aided by the fact that the boundaries of traditional hierarchies have included ridge-to-reef units (i.e., the Fijian *vanua*, the Solomons Islands *puava*, the Yap *tabinau*, the Hawaiian *ahupua'a*). In Pacific countries with strong legal recognition of traditional resource tenure, these decision-making bodies may reduce governance complexities, thus facilitating management across boundaries that are both ecologically and socially relevant.

Scaling up to a seascape unit, however, is more complex. While the boundaries of a seascape may be ecologically relevant for critical processes such as fish and coral larval dispersal from oceanographic currents, they can cross district, provincial and, in some cases, even national governance boundaries. Our approach in Fiji has largely been to work within traditional hierarchical units to implement EBM and then scale up these management networks across a seascape. Because we recognize that these disparate networks may not be enough to protect all critical ecosystem processes and functions, we have additionally been convening workshops with provincial planners to

highlight the gaps and discuss ways to extend community-based management across habitats that are critical for providing ecosystem services to the entire seascape.

On how defining ecosystems has affected management:

Marine management in Fiji works best when traditional governance boundaries are within the secure governance of a single district (*tikina*) and they encompass a large enough area to affect ecological processes. In Fiji, all of the traditional fisheries management areas (*qoliqoli*) have been legally demarcated by the Native Lands and Fisheries Commission.

While indigenous Fijians do not have tenure over the sea, they have traditional resource use rights within the *qoliqoli* boundaries and are encouraged by the government and the Fiji Locally Managed Marine Area (FLMMA) network to develop local management rules regarding closures and gear restrictions. In Kubulau *tikina*, where WCS-Fiji has assisted communities to implement ecosystem-based management since 2005, the process has been largely successful because the *qoliqoli* is large (260 km²), which enabled the establishment of Fiji's largest marine protected area (Namena Marine Reserve, 61 km²). In other regions, such as around Yanuca Island in Beqa Lagoon, it has been more difficult to establish firm management

rules or placement of closures because several of the *qoliqoli* are shared by communities from several *tikina* who are unable to agree upon the management measures.

On managing toward a particular, defined ecosystem state:

We base our management recommendations to Fijian communities on measures that, if well-enforced, will allow the preservation or restoration of the important ecosystem services on which people depend. For Fijians, the most important ecosystem services are food security, water regulation, and human health.

This approach represents a critical shift in thinking about marine ecosystem management. When I joined the WCS-Fiji in 2008 and inherited management of the Fiji EBM project, the original goal of the project was to “facilitate a shift of the marine ecosystem of the Vatu-i-Ra and Great Sea Reef Seascapes back to their ‘natural’ state.” After a thorough programmatic review, we identified that this target was unachievable given global environmental and climate change. Therefore we shifted our mission to: “preserve the functional integrity of the Vatu-i-Ra and Great Sea Reef Seascapes to sustain biodiversity, fisheries, and intact linkages between adjacent systems.”

more on next page

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Defining the Great Barrier Reef ecosystem as part of a major zoning program

By Leanne Fernandes

Editor's note: Leanne Fernandes managed a multi-year process, the Representative Areas Program, to rezone the Great Barrier Reef Marine Park (GBRMP) nearly a decade ago. The process involved defining the park ecosystem as comprising 70 largely contiguous bioregions. Her comments here have been reprinted from MEAM 1:1, published in 2007.

“If one is aiming for ecosystem-based management, then one needs an idea of what is intended by an ecosystem. From a management perspective, the definition needs to be politically, legally (jurisdictionally), socially, as well as ecologically sensible. This is likely to mean scientific compromise, presuming that science could give one a perfect geographical definition of an ecosystem in any one location. Of course, in as far as science is unable to offer the ‘perfect’ definition of ecosystem, the degree of compromise will be unknown.

“Given this umbrella, the political, jurisdictional, and social context is important. Depending on these factors, one can treat an estuary and all its components as an ecosystem for the purposes of ecosystem-based management — or a bay or a section of a continental shelf. If one's role is fisheries management, then the ‘ecosystem’ might be defined by the

area (including habitats and communities) used by the fish being managed or by the fishers pursuing the fish. On the Great Barrier Reef, for the purposes of rezoning the entire GBRMP through the Representative Areas Program, the ecosystem was defined as the composite of all parts of the Marine Park and the World Heritage Area. This included estuaries and intertidal areas beyond the boundary of the Great Barrier Reef Marine Protected Area (GBRMPA) but within jurisdiction of GBRMPA's management partner, the Queensland government.

“The definition of habitat and/or some kind of lower-scale ‘bioregion’ can help managers distinguish areas within their jurisdiction or within their definition of ecosystem. Again, from a management perspective, it is not necessarily useful to rely on a purely scientific definition of habitat or bioregion — assuming this were even available. One might first wish to consider what management objectives one aims to achieve. Water-quality management objectives, fisheries-management objectives, and biodiversity-management objectives may require different scientific, social, political, and jurisdictional factors to be considered in defining habitats or bioregions.”

For Fernandes's full remarks, go to <http://depts.washington.edu/meam/fernandes.htm>.

B. Defining a target ecosystem by what it used to be like

By Heike Lotze

Editor's note: Heike Lotze is Canada Research Chair in Marine Renewable Resources at Dalhousie University, Canada. An historical ecologist, Lotze studies past, present, and potential future human impacts on marine species and ecosystems. With this knowledge, she informs marine resource programs on how to define their target ecosystem state — such as one that existed prior to heavy or over-exploitation by humans — then manage toward it.

On managing toward past ecosystem conditions:

Although the idea may be attractive that management can redesign or recreate how historical ecosystems looked prior to heavy exploitation — say, 50, 100 or 500 years ago — we cannot do it. Too many variables have been altered. Also, we do not know every parameter or all species interactions of historical ecosystems, and cannot control or manage each of these individual parameters.

However, we can create conditions — by reducing harmful human impacts — that may allow certain species, populations, habitats, and water quality to recover toward “former” levels of abundance, distribution, diversity, complexity, or whatever you want to measure. What “former” levels can be achieved certainly depends on the magnitude of depletion,

degradation, and change, and what is possible given the new environmental or human conditions (e.g., how much coastline has been irreversibly transformed). I would try to aim for pre-heavy human impact, so probably pre-industrial levels — but essentially that is a value judgment. What does the local, regional, or global community want? If your goal is to end up with a more natural ecosystem, then you want to reduce the dominant human impacts and allow for natural controls (e.g., climate variability and species interactions) to take over again.

On factors that aid recovery of depleted populations:

Since most depletions, collapses, and extinctions have been caused by more than just one human impact, the recovery often depends on more than one factor as well. Among historical recoveries, the reduction of cumulative human impacts — especially exploitation, habitat loss, and pollution — was important in 78% of recoveries, according to our findings. Every species needs a range of conditions to be met to thrive, including proper habitat, food, environmental standards (e.g., clean water, air, sediments), and a low enough mortality rate (whether natural or human caused) in order to survive. If several of these conditions have been compromised, then it needs the restoration of all of them to enable recovery.

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C. How the definition of a target ecosystem informs current and future management

By Steve Gittings

Editor's note: Steve Gittings is Science Coordinator for the US Office of National Marine Sanctuaries. He facilitates research in the nation's 12 national marine sanctuaries, including how climate change is affecting species, habitats, and whole ecosystems.

On defining ecosystem boundaries:

The US National Oceanic and Atmospheric Administration has the following definition for “ecosystem”:

“A geographically specified system of organisms (including humans), the environment, and the processes that control its dynamics.”

Personally, I am not particularly fond of that definition because I believe it over-emphasizes geography and under-emphasizes the relationships and dependencies between species and those between species and the environment. Most of the definitions you will find in other places do not mention or imply anything about boundaries and focus more on components, the interactions between living and

non-living parts, and the flow of materials and energy between these parts.

But as you can imagine, some concept of boundaries and geographic limits to ecosystems is useful when it comes to management, even if they are hard to determine in the real world and are, in fact, different from the perspective of different species that have different requirements. So rather than focusing too much on ecosystem boundaries, the Office of National Marine Sanctuaries employs the concept of ecosystem-based management — looking at all the links among living and non-living resources, rather than considering single issues in isolation. The national marine sanctuaries make decisions and take action using this approach rather than worrying too much about specific boundaries of ecosystems.

On ecosystem boundaries vs. sanctuary boundaries:

Many people have recognized that sanctuary boundaries often do not coincide with ecosystem boundaries. The sanctuaries may contain ecosystems of interest, or

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are representative of larger ecosystems. In some cases they are limited by geo-political or practical considerations, such as they encompass pre-existing management areas or are rectangular to simplify enforcement.

In cases where changes have been made to the boundaries of national marine sanctuaries, ecosystem boundaries have been considered but have not been the sole driver of the sanctuary boundary determination. (Making changes to sanctuary boundaries is generally done as part of a review process undertaken when management plan revisions are made, or in some cases through congressional action.) When done during a management plan review, changing sanctuary boundaries involves extensive assessment of information on ecosystems and the threats they face (to judge the need for boundary changes), but also substantial evaluation of social and economic implications (such as impacts on users), and engagement of numerous sectors of the public. That being said, in each case the ecosystem is foundational as a starting point for the conversation and the primary target for biodiversity conservation. [Editor's note: A review of boundary expansion concepts for the Channel Islands National Marine Sanctuary is at <http://ccma.nos.noaa.gov/products/biogeography/cinms>. Another report, *Examples of Ecosystem-Based Management in National Marine Sanctuaries: Moving from Theory to Practice*, profiles EBM initiatives at eight national marine sanctuaries and one marine national monument in US waters: <http://sanctuaries.noaa.gov/science/conservation/pdfs/nceas.pdf>.]


Notes & News

Advice on applying coastal and marine spatial planning


To advise the US National Oceanic and Atmospheric Administration (NOAA) on developing coastal and marine spatial planning (CMSP) at a regional and national level, a working group of NOAA's Science Advisory Board has produced a review of 17 marine spatial planning processes from around the world. The review's findings and recommendations focus on seven measures that it identifies as central to development of CMSP: objectives, scope, authority, participants, data, decision support, and measures. The 36-page report "Strategic Advice on Designing and Implementing Coastal and Marine Spatial Plans" is available at www.sab.noaa.gov/Meetings/2011/may/ESMWG_CMSP_Report_Text_2May11.pdf.

On potentially re-defining target ecosystems in a climate-changed future:

The specter of climate change should be a wake-up call for all ecosystem-based management efforts in marine systems. The best practical approach would be to become more precautionary than we currently are with regard to controlling resource extraction and inputs by humans. The goal should be to endow ecosystems with as much natural "integrity" as possible. This means actively preserving or restoring ecosystem structure and function, and their inherent spatial and temporal variability, as resolved by the ecosystem's natural evolutionary history.

But even with stronger natural resistance, we are faced with the very real possibility of having to adapt our management to deal with restructured ecosystems that are substantially different from those that the marine sanctuaries were originally intended to protect (e.g., the loss of coral reefs in areas that currently protect them). For those, our management plans will adapt accordingly. And there may even be a bright side. These altered ecosystems could offer unexpected opportunities to exploit new services, such as new local food sources, new educational programs for visitors, or chances to engage volunteers in monitoring of changes. 

Book on EBM practice in Wider Caribbean

A new publication examines the practice of marine ecosystem-based management as it exists across the Wider Caribbean region, drawing on the collective experience and knowledge of practitioners and academics. Published by Amsterdam University Press, the book *Towards Marine Ecosystem-based Management in the Wider Caribbean* aims to provide a roadmap for achieving more robust implementation of EBM throughout the Caribbean Sea. Its primary audience is practitioners, decision-makers, and stakeholders in the region, but it may also be of use in other large marine ecosystems that face similar challenges to making EBM operational. It was edited by Lucia Fanning (Dalhousie University, Canada) and Robin Mahon and Patrick McConney (both of the University of West Indies, Cave Hill Campus, Barbados). The book is available for €42.50 (US \$60.30) at <http://bit.ly/EBMWiderCaribbean>. 

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Tundi's Take: Approaching EBM via an Ecosystem Approach

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

Many agencies tout their commitment to adopting an *ecosystem approach to management*. What is actually meant by this commitment, and whether it constitutes a move toward *ecosystem-based management*, is open to question. The terms are often used without clear definition or, when defined, use so much jargon as to be indecipherable.


But let's assume that what is meant by an *ecosystem approach to management* as adopted by a single

sectoral agency is that the entirety of an ecosystem is taken into consideration when setting the limits to that sector's use. Does this constitute EBM?

In my mind, the answer is no. The objectives for sectoral management are necessarily narrow, and are based on optimizing use for a particular sector. Thus fisheries managers might take whole ecosystems into account when optimizing fish harvest — keeping in mind what things affect the target stocks and the potential for utilizing them. Similarly, tourism ministries may propose policies and regulations that take whole ecosystems or seascapes into account, but nonetheless aim to maximize the recreational values of the area for tourism. Thus, the “ecosystem” enters into the management, but the management does not *de facto* become ecosystem-based. One could say that the ecosystem approach undertaken by each sectoral management authority is necessary, but not sufficient, to achieve true EBM and all the benefits that flow from it.

What true EBM requires is that an ecosystem becomes the focus of management in two ways: 1) management for single sectoral objectives takes the wider ecosystem into account, not just the target stock, resource, or area (this is what I consider to be the *ecosystem approach to sectoral management*), and 2) the management of all sectors across the ecosystem is coordinated in some way so that the integration of all necessary management produces EBM.

In effect this is two sides of a coin: management focuses on what affects the use or values being managed (this being an improved version of sectoral management, but sectoral management nonetheless), and management collectively focuses on the full array of ecosystem services that support all uses (ecosystem-based management).

EBM also means stretching what is meant by “ecosystem”. In most cases, true EBM will mean focusing on marine areas and species, but also focusing on coastal areas, freshwater, and watersheds, and even land use in areas removed from the coastal zone. Thus while the “ecosystem” in the ecosystem approach to sectoral management is somewhat circumscribed, the “ecosystem” in many cases of EBM is actually a suite of interconnected ecosystems, spanning wide areas, multiple uses, and a full range of management objectives. 

Letter to the Editor On the need for integrated management

Dear MEAM:

I strongly agree with all the comments in your April-May 2011 issue on the need for integration in management of marine (and terrestrial) ecosystems. I note that this recognition was at the heart of IUCN's *Guidelines for Marine Protected Areas* and *A Global Representative System of Marine Protected Areas* (IUCN, World Bank, and GBRMPA, 1995).

The following quotes from the *Guidelines* illustrate this. It may be worth pointing out that this recognition was at the heart of establishing the Great Barrier Reef Marine Park Authority and the GBR Marine Park through the Great Barrier Reef Marine Park Act (1975). For this reason the Act overrode conflicting, usually sectoral legislation of either state or federal governments of Australia.

- “There are two ways of establishing MPA systems: either as many relatively small sites, each strictly protected, or as a few large multiple-use areas which contain strictly protected areas within them. To conserve biodiversity, both approaches should occur within an effective program of ecosystem management covering the marine ecosystem and the land areas that affect it.”
- “The high degree of linkage between land and adjoining sea, and the inter-connectivity of the oceans, require that MPAs be integrated into management regimes that deal with all human activities that affect marine life. Thus MPAs should be integrated with other policies for land use and use of the sea. It is also desirable for countries to make use of international agreements, notably the UN Convention on the Law of the Sea and the Convention on Biological Diversity. More international support is needed for MPAs and more attempts should be made to establish MPAs on the High Seas.”

Graeme Kelleher. AO.

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Editor's note: Graeme Kelleher edited *Guidelines for Marine Protected Areas* (<http://cmsdata.iucn.org/downloads/mpaguid.pdf>) and *A Global Representative System of Marine Protected Areas* (www.earthprint.com/productfocus.php?id=IUCN93).

Notes & News

US releases draft action plans for addressing national ocean policy objectives

The US national ocean policy prioritizes nine objectives to address challenges that face the country's coastal and marine resources. The federal interagency National Ocean Council is overseeing development of strategic action plans for each of the nine objectives. As a first step, the council has released draft strategic action plan outlines of each objective for public comment.

The purpose of the action plans is to provide an initial view on how federal agencies might address the priority objectives. Among the broad objectives are *ecosystem-based management* and *coastal and marine spatial planning*.

The review is open for 30 days from 2 June 2011. To download and comment on the draft action plans, go to www.whitehouse.gov/administration/eop/oceans/sap.

Book helps coastal managers address problems that arise upstream

Among the challenges faced by managers of coral reefs and other coastal ecosystems is the flow of multiple harmful substances down rivers and streams from upland areas. These substances include sediments, nutrients (including from sewage), pesticides, heavy metals, and litter, among other things.

There is now a guide to help coastal managers deal with these issues, including through cooperation with people and industries upstream. The 120-page publication *Catchment Management and Coral Reef Conservation: A Practical Guide for Coastal Resource Managers to Reduce Damage from Catchment Areas Based on Best Practice Case Studies* draws lessons from 33 case studies in Asia, the Pacific, Australia, the Caribbean, and the tropical Atlantic.

Among the guide's key messages is the importance of raising public awareness of problems and solutions. "Often people are unaware that their actions are causing damage to downstream areas," write co-authors Clive Wilkinson and Jon Brodie. "With good information and explanatory materials, it is possible to form partnerships with people living and working upstream in the catchment area to solve problems that happen downstream." Useful as a training manual and published by the Global Coral Reef Monitoring Network (GCRMN), the guide can be downloaded at www.gcrmn.org. In addition, paper copies are available for free if you pay the shipping cost. For a paper copy, e-mail Clive Wilkinson at clive.wilkinson@rrrc.org.au.

EU study suggests maritime spatial planning will have large positive economic effect

A new study carried out on behalf of the European Commission analyzes the potential direct and indirect economic effects of marine spatial planning, as well as the benefits to come from implementing MSP throughout EU waters. (The EU refers to marine spatial planning as *maritime* spatial planning.)

The study finds that if the MSP process "is managed properly," the economic effects are fourfold: (1) enhanced coordination and simplified decision processes, (2) enhanced legal certainty for all stakeholders in the maritime arena, (3) enhanced cross-border cooperation and (4) enhanced coherence with other planning systems. Furthermore, several additional non-economic effects are likely to result from MSP, such as support for management in realizing a good environmental status in EU coasts and seas.

"Maritime spatial planning can have a significant and substantial positive economic effect on Europe's maritime economy," concludes the study. "[MSP] should therefore be seen as one of the steps forward to improving the competitive position of European Member States." *Study on the Economic Effects of Maritime Spatial Planning* is available at http://ec.europa.eu/maritimeaffairs/studies/economic_effects_maritime_spatial_planning_en.pdf.

Report offers guidance on tools for marine spatial planning

Marine spatial planning (MSP) can be a complex process: it involves reducing conflicts and optimizing the compatibility of uses while minimizing environmental impacts at the same time. As a result of the amount of data that can be involved, many practitioners are turning to software tools that incorporate and analyze maps, models, databases, and other information to inform planners' decisions. These are called decision support tools, and they provide a holistic view of where proposed ocean uses may be viable.

A new report aims to help coastal planners and managers select the right decision support tools for their needs. Produced by the Center for Ocean Solutions and PacMARA, *Decision Guide: Selecting Decision Support Tools for Marine Spatial Planning* describes the function of nine decision support tools and how their capabilities align with steps in a typical MSP process, such as gathering data and identifying issues and constraints. It draws on case studies of each tool as applied in an MSP setting.

"The *Decision Guide* does not set out to convince people to adopt MSP," says Meg Caldwell, executive director of the Center for Ocean Solutions. "It meets people where they are, gives them good informa-

Issue of IUCN Marine News available

The latest issue of *Marine News*, the newsletter of the IUCN Global Marine and Polar Programme, was released in May 2011. It covers the topics of protecting the high seas, identifying areas of high biodiversity in the Arctic, improving management of Mediterranean MPAs, and more. The newsletter is produced irregularly by IUCN, appearing annually or semi-annually. The current issue and back issues are available at www.iucn.org/about/work/programmes/marine/gmp_newsletter.

tion about what MSP involves, and describes readily available tools they should consider, whatever their planning needs might be.” *Decision Guide: Selecting Decision Support Tools for Marine Spatial Planning* is at www.centerforoceansolutions.org/sites/default/files/pdf/cos_msp_guide.pdf.

New research center conducts wide range of marine EBM- and MSP-related studies

The new Center for Marine Assessment and Planning (CMAP) at the University of California, Santa Barbara, unites all activities at the university related to science, policy, management, use, and conservation in the oceans. This includes multiple projects pertaining to marine EBM and marine spatial planning (MSP). Among these are research programs on cumulative impact assessments, integrated land-sea planning, various decision support tools, sustainable fisheries, spatial tradeoffs for marine planning, governance for sustainable development, and the Ocean Health Index, which measures the status of and trends in multiple components that determine global ocean health. CMAP is directed by Ben Halpern. The program website is <http://cmap.msi.ucsb.edu>.

Unique guidebook provides advice on communication between decision-makers and scientists

A new publication from the Science-to-Action partnership provides practical tips for decision-makers and scientists on how to communicate with each other on matters of marine resource management. The *Science-to-Action Guidebook* consists of two sections: “A Decision-maker’s Guide to Using Science” and “A Scientist’s Guide to Influencing Decision-making”. One section starts from the front, the other from the back, and they meet in the middle as a summary centerfold. The guidebook draws heavily on cases from around the world.

The Science-to-Action partnership involves more than 400 scientists and 75 partner institutions worldwide in studies on marine managed areas. For an electronic copy of the 20-page guidebook, go to www.science2action.org/s2Aguidebook. Printed copies of the *Science-to-Action Guidebook* are available on request by contacting Septiana Rustandi at s.rustandi@conservation.org.

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

Using toolkits for EBM

An EBM toolkit is a set of interoperating tools for conducting an EBM process. Using such toolkits allows users to tackle analyses that single tools cannot do alone. Examples of recent projects that have used toolkits include:

- **The Creating Resilient Communities Project**, which modeled possible future scenarios for three coastal counties in the US state of South Carolina. Specifically the project evaluated outcomes related to natural hazards, sea level rise, community vulnerability, and biodiversity conservation.

Toolkit used: NatureServe Vista, NOAA’s Community Resilience and Vulnerability Assessment Toolkit, and Placeways’ CommunityViz. *For more on this project:* <http://bit.ly/SouthCarolinatoolkit>

- **The Mission-Aransas Ecosystem Management Project**, which developed alternative land use strategies for Aransas County, Texas (US), to best meet ecological and socioeconomic sustainability objectives, including for water quality and estuarine-marine resources.

Toolkit used: NatureServe Vista, NOAA’s Nonpoint-Source Pollution and Erosion Comparison Tool, Placeways’ CommunityViz. *For more on this project:* <http://bit.ly/Aransastoolkit>

On the subject of toolkits, a recent study examined the two projects above and four others that used EBM tools, and provided the following lessons on tool effectiveness:

- Projects should try to provide training in the toolkit or individual tools to a diverse set of users so there is always local knowledge on how to use the often-complex toolkits even if some users move away;
- Projects should carefully consider the data requirements for using toolkits because developing data can be resource-intensive and data limitations can influence where the toolkit can be used;
- Convening experts in an area can be an effective and relatively inexpensive way to develop needed data; and
- Projects should allocate time for using tools and toolkits realistically because it often takes more time than initially anticipated.

Read the report (“Bridging the Divide Between Science and Planning: Lessons from EBM Approaches to Local and Regional Planning in the United States”, PlaceMatters, 2011) at <http://bit.ly/EBMtoolstudy>.

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