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## **Case: Management of Monterey Bay Affected by Changes in Agricultural Practices Upstream** <sup>[2]</sup>

In 2006, a strain of *E. coli* bacteria contaminated fresh spinach from California's Salinas Valley, the main growing region for leafy green vegetables in the U.S. It is unknown how the bacterium came in contact with the spinach, but it led to a national outbreak of *E. coli*-related illness. Nearly 200 people across the country became sick.

As rivers and streams from Salinas Valley drain into Monterey Bay on the central coast of California, indirect effects of the outbreak have also flowed downstream. Voluntary conservation practices that spinach growers had previously put in place under guidance from resource managers - such as wooded buffer areas between fields and streams to reduce agricultural runoff - have now been removed by the growers. The removal came under pressure from spinach-processing companies and other buyers, who wanted to avoid any chance of *E. coli* contamination from animal feces. In turn, the reversal of the conservation practices is leading to greater runoff into Monterey Bay. Resource managers are faced with finding solutions to address two needs simultaneously: food safety and conservation.

### **Working cooperatively with growers**

All of Monterey Bay lies within the 21,000-km<sup>2</sup> Monterey Bay National Marine Sanctuary (MBNMS). (Maps of the sanctuary are available at <http://montereybay.noaa.gov> <sup>[3]</sup>.) MBNMS management has long recognized the influence that Salinas Valley agriculture has on downstream water quality. "We have partnered with many groups and individuals over the last decade to implement voluntary strategies to protect and enhance the quality of water flowing off farm fields into the sanctuary," says Lisa Lurie, Agriculture Water Quality Coordinator for MBNMS.

These partnerships largely occur under the umbrella of the Agriculture Water Quality Alliance (AWQA), a regional initiative. AWQA includes MBNMS staff as well as personnel from the U.S. Department of Agriculture, several regional resource conservation districts, farm bureaus, academic researchers, industry groups, and NGOs. Together they have supported Salinas Valley growers in implementing practices to prevent erosion, reduce the use of agricultural chemicals, and protect wildlife. Many of the voluntary practices involve allowing vegetation on and around farmland. Prior to 2006, most growers in the valley had adopted at least one conservation practice under AWQA guidance. These practices were estimated to prevent 258,000 tons of sediment from entering the sanctuary annually.

When the *E. coli* outbreak occurred, it spurred the development of food safety programs that were in conflict with conservation goals. "Farmers were caught in the middle," says Lurie. Although there is no evidence that the removal of vegetated buffers from farmland reduces the risk of *E. coli* contamination, and it remains unclear that the *E. coli* contamination site was even in a field (as opposed to farther along the food-handling chain), some buyers and processors urged farmers to cut down the buffers and leave the soil bare.

AWQA partners are now working to develop solutions to address both food safety and conservation at once. They have applied several strategies:

- **Education and outreach:** The Resource Conservation District of Monterey County and the U.S. Department of Agriculture have conducted training sessions on the conservation aspects of food safety to food safety professionals. AWQA has trained state conservation personnel on food safety considerations for conservation planning.
- **Research:** Scientists at the University of California are investigating factors that affect *E. coli* growth and survival in agricultural soils. Other AWQA partners are evaluating the effectiveness of water quality practices in reducing the concentration and migration of bacterial pathogens in irrigation runoff.
- **Technical assistance:** AWQA partners are providing technical and financial assistance to growers to improve the efficiency of their use of water and fertilizers. Making such uses more efficient is another way to reduce runoff, but without raising fears of *E. coli* contamination. It also saves money for farmers.

"By keeping sediment on the fields, farmers are keeping the pesticides and nutrients on the fields, too - all of which benefits water quality in Monterey Bay," says Lurie. "Water quality is essential to ensuring protection of marine resources. And effective watershed management is critical to marine ecosystem-based management."

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**AWQA website:** [www.awqa.org](http://www.awqa.org) <sup>[4]</sup>

**Article:** "Crops, ponds destroyed in quest for food safety", *San Francisco Chronicle*. 2009. [www.upi.com/turl-aa2d2e/](http://www.upi.com/turl-aa2d2e/) <sup>[5]</sup>

**Article:** "Food safety and environmental quality impose conflicting demands on Central Coast growers". *California Agriculture* magazine. 2008. <http://californiaagriculture.ucanr.org/fileaccess.cfm?article=65599&p=ZBCUWA&filetip=pdf> <sup>[6]</sup>

## **BOX: Tips on working with growers to implement voluntary conservation practices on their farms**

From Lisa Lurie, Agriculture Water Quality Coordinator for the Monterey Bay National Marine Sanctuary:

- Building relationships is key. Reach out to the leading land-based resource conservation and agricultural groups in your watershed. Through these types of partnerships you can build a network with innovative growers who are leaders in their own community.
- Respect the growers' knowledge of the land and recognize their capacity to be both savvy business operators and environmental stewards. Rather than prescribing a "one-size-fits-all" solution to growers, empower them with tools and information to make informed decisions on their ranches that benefit both the environment and their financial bottom line.
- You can never anticipate all of the interrelated issues that affect resource use decisions on the farm. Food safety is a perfect example. Constantly evolving and building new relationships to address these seemingly external issues is critical to successful, collaborative conservation.
- In addition to setting long-term goals, set some shorter-term ones and celebrate their accomplishment, both to recognize the stewardship efforts of growers and to maintain collaborative momentum among the partners.

## **Planning Spotlight: Developing a Framework for EBM Planning on Addu Atoll, Maldives** <sup>[7]</sup>

A report released last May provides the framework for future ecosystem-based planning on and around Addu Atoll in the Indian Ocean nation of Maldives. Addu is the second-most populous atoll in the Maldivian archipelago, which encompasses 26 atolls and more than a thousand islands and islets. The report *Framework for an Ecosystem-Based Management Plan for Addu Atoll, Republic of Maldives* was co-developed by the Government of the Maldives and the University of Queensland (Australia), with funding from the Australian and New Zealand overseas aid programs. It is available at [www.gefcoral.org/Portals/53/downloads/EBM%20Framework-Addu%20Atoll.pdf](http://www.gefcoral.org/Portals/53/downloads/EBM%20Framework-Addu%20Atoll.pdf). <sup>[8]</sup>

Rather than dictating a specific EBM plan for Addu, the report is a template that Maldivian planners will use later to develop such a plan. Richard Kenchington, who participated as part of the Australian planning contingent, says it made sense to start with a framework in this case rather than jumping right into EBM planning for Addu.

"Our Australian team's task was to work with staff of the Maldivian Ministry of Environment, Energy and Water to develop their national capacity for EBM planning and implementation," he says. "The approach of developing a framework provided a good basis for such capacity-building. It also reflected a view that an EBM plan cannot simply be imposed on a community, particularly if it is seen by that community to be driven by external experts - such as Australians in this example. In my view, a developed framework with clear operational principles appropriate to the social and environmental context is an important precursor to effective, accepted, and implementable planning."

The framework offers guidance on a wide range of subjects, from setting goals and indicators for success, to conducting an environmental impacts assessment, to convincing stakeholders of the value of protecting ecosystem health. Kenchington says Queensland University is already applying elements of the framework in the Cook Islands and will be running a workshop to introduce the concepts more widely to Pacific Island nations.

For more information:

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## **EBM, the Namibian Way** <sup>[9]</sup>

By Tundi Agardy ([tundiagardy@earthlink.net](mailto:tundiagardy@earthlink.net)), Contributing Editor, MEAM

Where are some of the most exciting new efforts in EBM being practiced? My answer may surprise you. Namibia. It is a country that has not trumpeted a claim of doing EBM, but seems well on the way to comprehensive and integrative management.

There are four important pillars to Namibia's exemplary management: (1) the newly declared Namibian Islands MPA; (2) two recently linked coastal national parks; (3) the Benguela Large Marine Ecosystem program; and (4) Namibia's emerging coastal policy.

The Namibian Islands MPA signaled the country's commitment to adopting an ecosystem approach to fisheries management. Designated this year, the MPA is Namibia's first, spanning almost one million hectares of islands and important ocean habitat. It accommodates many different uses, including commercial and recreational fisheries, ecotourism, and even diamond mining. This cross-sectoral management has meant that even though the protected area was designed with fisheries management in mind, the reach of management extends beyond fisheries to a wide variety of uses. Planning the MPA involved players from national government, regional and local authorities, the private sector, and conservation NGOs.

Then there are the recently designated Sperrgebiet National Park and Namib Naukluft National Park - two coastal parks that span the entire coastline of the country. With cooperative planning and an institutional structure that allows for cooperative management, the new park designations create a land-sea link to promote co-management among the Ministry of Environment and Tourism, the Ministry of Fisheries and Marine Resources, and regional and local authorities.

The Benguela Current Large Marine Ecosystem Project was launched in 1995 to address problems shared by Angola, Namibia, and South Africa, including the management and migration of valuable fish stocks across national boundaries, harmful algal blooms, alien invasive species, and transboundary pollutants. The Benguela Current Commission (BCC) enables the three countries to engage constructively, and by 2011 there will be a legally binding mechanism to resolve marine management issues.

Finally, there is Namibia's emerging coastal policy, just released in draft form. Significant stakeholder input was involved in developing it, including in defining the desert country's coastal zone (it extends inland as far as the sea fog belt). Additional public feedback is expected concerning prioritization of issues, institutional restructuring to build capacity, and other governance topics.

Namibia's coastal and marine policies thus reflect all the central tenets of EBM, including participatory planning, integrated (cross-sectoral) management, an attempt to find the best institutional structure, strong feedback loops between science and policy, and mechanisms for adaptive management.

These developments in Namibia are all new, fresh, and exciting. It remains to be seen whether this nation can demonstrate true integration across these four EBM pillars to claim full-fledged EBM. But no matter what further integration occurs, the country is well down the path toward exemplary management, and looking to see if the world will follow.

For more information:

[www.nacoma.org.na](http://www.nacoma.org.na) <sup>[10]</sup>

Website of the Namibian Coast Conservation and Management project, including information on Namibia's coastal policy and the new coastal national parks

[www.bclme.org](http://www.bclme.org) <sup>[11]</sup>

Website of the Benguela Current Large Marine Ecosystem Project

[www.mfmr.gov.na](http://www.mfmr.gov.na) <sup>[12]</sup>

Website of the Namibian fisheries ministry, including information on the Namibian Islands MPA

## **Perspective: Marine Protected Areas, EBM, and Governance of Small-Scale Fisheries in Indonesia** <sup>[13]</sup>

**Editor's note:** Peter Mous and Jos Pet of People & Nature Consulting International have worked in Indonesia since 1995 with NGOs, foundations, and government agencies on fishery management and MPA development.

By Peter J. Mous ([pjmous@pnc-int.com](mailto:pjmous@pnc-int.com)) and Jos S. Pet ([spet@pnc-int.com](mailto:spet@pnc-int.com))

Coral reefs in Indonesia, an important service-production system, are not in good shape and the situation is deteriorating. Among the most pervasive threats to the reefs are overfishing and destructive fishing. A large part of the fishing effort on Indonesian reefs is realized by a dispersed, multi-gear, and multi-species small-scale fishery. This fishery is set in a mostly open-access, weak governance system, and behavior of individual fishers hardly affects the overall outcome of the fishery - a perfect storm of factors contributing to overfishing.

Marine protected areas (MPAs) and ecosystem-based (fishery) management (EB(F)M) have both been advocated as tools or approaches toward addressing overfishing. Both tools aim to keep ecosystems in good shape. EB(F)M is often seen as a technical process toward a holistic management plan that maximizes sustainable benefits from ecosystems in terms of fisheries, tourism, shore protection, etc. We can, however, also approach EB(F)M as a governance concept. To this end, one would need to introduce a management entity that is concerned with the status of the ecosystem as a service-production system. A critical prerequisite is that such management entity must benefit from the sustained health of the ecosystem, rather than from today's catch. Government agencies are often expected to take this role. In Indonesia, however, government agencies cannot live up to this expectation, because their bottom lines only indirectly factor in ecosystem health. Government agencies are set up to do what their constituencies expect from them in the least confrontational way, which is not always the same as what would be best for ecosystem health - hence the country's proliferation of paper parks and meaningless fishery regulations.

Some private sector entities, such as dive resorts with house reefs and pearl farms, do have a bottom line that directly depends on ecosystem health. Those that were able to secure a management mandate generally succeed in keeping "their" ecosystems in good shape. This is testimony to the power of EB(F)M.

## Fisheries cooperatives as a useful tool

However, these examples cover only a small part of Indonesia's reefs, and they do not explicitly consider sustainable capture fisheries. An example of EBFM that does consider capture fisheries is Japan's coastal fishery management system. In Japan, prefectures devolve the right to manage fisheries to fisheries cooperatives, and fishing in coastal areas is restricted to fishers who are members of these cooperatives. For the cooperative, the act of fishing by its members is just one part of its business plan, and the cooperative's overall objective is to keep the production system under its care in good shape. The Japanese system resolves open access, and it takes measures on the basis of the outcome of the entire fishery, rather than on the basis of income of individual fishers.

A management system inspired by the Japanese example holds promise for Indonesia's reef fisheries, and the Indonesian government already conducted a feasibility study on this matter. Furthermore, Indonesia's coastal zone management law of 2007 specifically allows for devolution of fishery management to non-governmental groups, including cooperatives.

The question is whether cooperatives can be trusted to do the right thing at all times. Considering the virtual absence of any effective fishery management in Indonesia's near-shore fisheries, one could argue that there is not much to lose by trusting cooperatives. Nevertheless it seems wise to put safeguards in place. This is where marine reserves come in. Provided that these reserves are designated as true no-take areas where all extractive use is prohibited, (local) government agencies could use reserves to mediate against the risk that some of the cooperatives might fail to keep "their" ecosystems in good health. These reserves would encompass reefs whose value to the public (including fishing communities) exceeds the value they might have as a fishing ground to nearby communities. By ensuring that at least 10% of reefs and other critical habitats are included in reserves, the public can be confident that reefs will survive, especially if cooperatives choose to establish additional reserves.

Provided that cooperatives are granted exclusive management rights for all near-shore fisheries within well-defined areas, we think that EB(F)M planners will find mandated cooperatives an extremely interested and very important audience - perhaps the first truly interested clients for EB(F)M-related tools. The marine reserves, a critical component in this context, would give direction to Indonesia's push toward a dramatic increase in MPAs (10 million ha by 2010, 20 million ha by 2020). That push is now getting side-tracked by a focus on multiple-use protected areas, which merely add a confusing and often ineffective layer of modified fishery management in certain areas. A focus on marine reserves rather than multiple-use MPAs, in combination with truly inspired EB(F)M for fished areas, could make all the difference for reefs and coastal people in Indonesia.

## EBM Bookshelf: New Publications on Marine EBM <sup>[14]</sup>

### *Marine Spatial Planning: A Step-by-Step Approach toward Ecosystem-based Management*

By Charles Ehler and Fanny Douvere.

2009, Intergovernmental Oceanographic Commission and Man and the Biosphere Programme, 99 pages. Free at [www.unesco-ioc-marinesp.be/msp\\_guide](http://www.unesco-ioc-marinesp.be/msp_guide) <sup>[15]</sup>

Taking a practitioner-oriented approach to its subject, this publication breaks down the process of marine spatial planning (MSP) into 10 distinct steps. It describes and assigns tasks related to each step, provides maps of existing MSP initiatives around the world, and offers several quick tips and helpful reminders along the way. It even offers advice on what to do if you "get stuck" in the process of MSP ("Analyze the problem; start with the easier parts; don't try to do it all at once").

"Numerous attempts have been made to define both the scope and nature of MSP, but relatively few have discussed how to put it into practice," write Ehler and Douvere. "This guide aims at answering your questions about how to make MSP operational in such a way that can move your initiative toward successful results."

Ehler and Douvere point out that MSP can be undertaken at a variety of scales - not just as a national-scale effort. "While some countries like Belgium, The Netherlands, and Canada have taken a top-down approach from the national level, that is not the case elsewhere," they say. "In the territorial seas of Sweden and Norway, for example, MSP traditionally has been the responsibility of local governments. In British Columbia (Canada), First Nations indigenous people are developing local marine spatial plans ahead of provincial and federal efforts. In Germany, and now the U.S., MSP was started at the state level."

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### *Ocean and Coastal Ecosystem-Based Management: Implementation Handbook*

By Kathryn Mengerink, Adam Schempp, and Jay Austin.

2009, Environmental Law Institute, 169 pages. Free at [www.elistore.org/reports\\_detail.asp?ID=11350](http://www.elistore.org/reports_detail.asp?ID=11350) <sup>[16]</sup>. Hard copies are available for free in limited quantities; for a hard copy, e-mail [mengerink@eli.org](mailto:mengerink@eli.org)

With a focus on the U.S., this guide identifies successful approaches to implementing marine EBM, including opportunities to apply them in the future and descriptions of the approaches' limitations. With examples to illustrate how practitioners are taking steps toward EBM, the handbook is designed to share a variety of strategies that may be useful in different settings depending upon regional needs and opportunities.

Rather than covering all aspects of EBM, the authors focus on five specific challenges to implementation and governance that arose repeatedly in the course of their research. These areas of focus are:

1. Developing an ecosystem-based vision and plan;
2. Incorporating ecosystem science and information into management decisions;
3. Creating accountability and adaptive management for executing ecosystem plans;
4. Addressing cumulative ecosystem impacts within and across management sectors; and
5. Making tradeoffs among competing and/or conflicting ocean uses.

## **Ecosystem-Based Management for the Oceans**

Edited by Karen McLeod and Heather Leslie.

2009, Island Press, 368 pages. US \$45 at [www.islandpress.org](http://www.islandpress.org) <sup>[17]</sup>

With contributions from 46 scholars and practitioners, this book is a comprehensive guide to the science and practice of marine EBM. It takes a cross-disciplinary approach to its subject, spanning the fields of anthropology, complexity science, ecology, economics, fisheries science, geography, philosophy, political science, resource management, and sociology. As such, it provides a synthesis of emerging knowledge needed to inform the practice of EBM. The book also features several case studies from around the world to demonstrate EBM in practice. "The case studies in the book illustrate the diverse ways that practitioners are translating the concepts of EBM so that they work with their local social and ecological contexts," say McLeod and Leslie.

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## **Book excerpt from *Ecosystem-Based Management for the Oceans***

"There is no single correct path to EBM. The approach will be put into practice in many different places across a range of spatial scales, each with its own unique historical, ecological, and social context. [...] Regardless of the starting point, EBM must ultimately include (1) a means for sectors to work toward common goals, (2) a mix of strategies to allow for both protection and use, (3) long-term monitoring and research, and (4) adaptive frameworks to allow us to learn from management actions, test alternate approaches, and re-adjust as either knowledge or systems change. Thus, EBM relies not on prescription, but on adapting a set of approaches suited to a particular context. Our aim [with this book] is to provide the bricks and mortar from which practitioners can build an EBM approach appropriate to their circumstances."

From *Ecosystem-Based Management for the Oceans*, edited by Karen McLeod and Heather Leslie. Copyright (c) 2009 Island Press. Reproduced by permission of Island Press, Washington, D.C.

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## **The EBM Toolbox: EBM Tools for Marine Spatial Planning** <sup>[18]</sup>

By Sarah Carr

Marine spatial planning (MSP) can help deal with emerging and existing conflicts for ocean space. Many steps in an MSP process require or are facilitated by the use of software tools or other well-defined, spatially-explicit methodologies. For example:

- **Management Identifying the Needs of Ocean Ecosystems (MINOE)** (<http://minoe.stanford.edu> <sup>[19]</sup>; available for free) can help identify laws, regulations, and agencies relevant to management of ecosystems. Users construct or import ecosystem models with elements and relationships. MINOE outputs laws and regulations containing the elements and relationships, and highlights governance gaps.
- **Cumulative Impacts Model** ([www.nceas.ucsb.edu/GlobalMarine](http://www.nceas.ucsb.edu/GlobalMarine) <sup>[20]</sup>; available for free) is a process for mapping human activities that impact ecological communities. It quantifies the vulnerability of marine ecosystems to these activities, and assesses the cumulative impacts of human uses on the ecosystem. Human activities can be included or excluded from consideration to determine suites of activities that can meet objectives for a given area.

You can learn more about tools for other MSP tasks at [www.ebmtools.org/msptools.html](http://www.ebmtools.org/msptools.html) <sup>[21]</sup>.

[Editor's note: The goal of The EBM Toolbox is to promote awareness of software tools for facilitating EBM processes. It is brought to you by the EBM Tools Network, a voluntary alliance of tool users and developers. Sarah Carr is coordinator of the Network. Learn more about EBM tools and sign up for Network updates at [www.ebmtools.org](http://www.ebmtools.org) <sup>[22]</sup>.]

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## **Notes & News: U.S. - Massachusetts - Tropical marine EBM - LMEs - Arctic marine EBM** <sup>[23]</sup>

### **Obama launches task force on marine planning**

On 12 June, U.S. President Barack Obama established a task force to help create a national policy for the country's marine waters. The task force is to provide recommendations for the policy and its implementation by mid-September, as well as develop a framework for effective marine spatial planning by December. The group consists of senior officials from multiple federal departments and agencies with jurisdiction over the ocean. The president's proclamation is at [www.whitehouse.gov/the\\_press\\_office/Presidential-Proclamation-National-Oceans-Month-and-Memorandum-regarding-national-policy-for-the-oceans](http://www.whitehouse.gov/the_press_office/Presidential-Proclamation-National-Oceans-Month-and-Memorandum-regarding-national-policy-for-the-oceans) <sup>[24]</sup>.

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### **U.S. state of Massachusetts releases draft ocean planning map**

On 1 July, the U.S. state of Massachusetts released a draft ocean management plan for public comment. The draft plan establishes three management categories and applies them to Massachusetts ocean waters: Prohibited Area, Multi-Use Area, and Renewable Energy Area. It is considered the first draft plan in the U.S. to apply comprehensive marine spatial planning. Massachusetts' marine jurisdiction extends 3 nm from shore.

Expected to be finalized by the end of 2009, the ocean plan will provide a framework for managing, reviewing, and permitting proposed uses of state waters. Until now, development in state waters has been managed on a case-by-case basis. Driving the plan's development have been proposals for offshore wind-energy farms in Massachusetts waters, which have drawn opposition from coastal communities in the state. The draft plan is at [www.mass.gov/eea/mop](http://www.mass.gov/eea/mop) <sup>[25]</sup>.

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### **Journal theme issue on tropical marine EBM**

The May 2009 issue of the journal *Coastal Management* is a special theme issue devoted to the feasibility of tropical marine EBM. Based on the findings of a working group at the National Center for Ecological Analysis and Synthesis, the issue draws on hundreds of interviews and a review of field experiences from around the world. The authors describe several design principles for successful EBM programs, including that the programs:

- Be tailored to each location;
- Utilize a wide variety of tools, such as creating MPAs and managing fishing effort;
- Balance ecological concerns with social and governance concerns; and
- Have the sustained commitment of institutions, governments, resource users, scientists, and donors.

The case studies present research from the Philippines, the Caribbean, the Benguela Current (Southern Atlantic Ocean), and Hawaii. Most of the theme issue (Vol. 37, Issue 3&4) is available for purchase only, although an overview article is available for free at [www.informaworld.com/smpp/content~content=a910537346~db=all~order=page](http://www.informaworld.com/smpp/content~content=a910537346~db=all~order=page) <sup>[26]</sup>.

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## **Large marine ecosystems are undergoing changes**

According to a new report by the UN Environment Programme, 61 of the world's 64 large marine ecosystems have exhibited a significant increase in sea surface temperature

in the last quarter-century. These increases have contributed to declines in fisheries catches in most LMEs, concludes the report. However, it adds, some northern Atlantic LMEs are actually seeing increased fisheries catches, as their previously cold waters are warmed and become more hospitable to zooplankton. Plankton forms the base of the ocean food web. The publication also concludes that LMEs face continued challenges from threats such as overfishing, habitat degradation, eutrophication, toxic pollution, aerosol contamination, and emerging diseases. *The UNEP Large Marine Ecosystem Report: A Perspective on Changing Conditions in LMEs of the World's Regional Seas* available at [www.lme.noaa.gov/LMEWeb/Downloads/unep\\_lme\\_report.zip](http://www.lme.noaa.gov/LMEWeb/Downloads/unep_lme_report.zip) [27].

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## Report: best practices in Arctic marine EBM

A new Arctic Council publication details existing work by several Arctic nations in marine EBM, and distills a set of lessons learned to this point in the region. The report *Best Practices in Ecosystems Based Oceans Management in the Arctic* represents the findings of a two-year Arctic Council project. It features seven case studies (Canada, Denmark/Greenland, Finland, Iceland, Norway, Russia, and the U.S.), as well as a chapter on indigenous perspectives.

The report summarizes the best practices for Arctic EBM as:

- Flexible application;
- Integrated and science-based decision-making;
- Commitment to ecosystem-based oceans management;
- Area-based approaches and transboundary perspectives;
- Stakeholder participation; and
- Adaptive management.

As addressed in the report, the application of EBM to Arctic waters raises a number of issues across the region, including ice-covered waters, transboundary cooperation, fisheries management, exploitation of petroleum under severe climatic conditions, long-range transport of pollutants, indigenous communities, and the impacts of climate change.

The 116-page report, published by the Norwegian Polar Institute, is available at <http://portal.sdwg.org/media.php?mid=1017&xwm=true> [28].

## Poll: Should Conservation Be Considered a "Use" of the Marine Environment? [29]

This past May at the International Marine Conservation Congress in Washington, D.C., there was a symposium on the progression of ocean management - from centuries of unregulated exploitation to today's increasingly ecosystem-based policies and use restrictions. Amid this discussion, a debate arose over conservation. That is, what role should conservation play in today's policy-making? In short, the debate was whether conservation should be considered a "use" of the oceans.

The question is central to EBM. If a planner applies the same importance to conservation as to fishing, for example, this will yield a different result than if conservation were considered to be more important, or less important, than that use. The question surrounds many EBM negotiations with stakeholders, yet is rarely discussed in a straightforward way.

This month MEAM sought answers to it. We asked conservationists, resource users, and others the following question:

"In the context of EBM and the negotiations it often entails with stakeholders, should conservation be considered a use of the marine environment - similar to uses such as fishing, shipping, tourism, etc.?"

Here are their responses:

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### Conservation is a policy goal, not a use

#### Elliott Norse

President, Marine Conservation Biology Institute, Bellevue, Washington, U.S. E-mail: [elliott@mcbi.org](mailto:elliott@mcbi.org)

"Is conservation (of biodiversity) a use - no more or less important than other uses? No, whether we base the answer on logic or public policy.

"Conservation is saving for the future. That is true whether its purpose is veneration, learning, benefiting from ecosystem services, or benefiting from consumptive use. Use of biodiversity is possible because living things grow and reproduce, analogous to capital that generates interest that humans can use sustainably. That is why some environmentalists, scientists, animal rights people and fishermen can all legitimately claim to be conservationists. Because use is only one of the reasons for conservation, conservation is a level above use and these other purposes in the logical hierarchy. Thus, logically, conservation is not a use.

"Conservation is an overarching policy goal because publicly owned resources are a public trust to be managed for the benefit of society. Individual fishes or fish species do not belong to fishermen, but to the public. The same is true at lower (genetic) and higher (ecosystem) levels of biodiversity. To the extent that humans can claim ownership of biodiversity, we must conserve it to benefit the public. Because only some people are consumptive users, but all benefit from conserving biodiversity, conservation is not a use."

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### Conservation is a use when it justifies transferring benefits from one group to another

#### Nici Gibbs

Policy Manager, New Zealand Seafood Industry Council, Wellington, New Zealand. E-mail: [Nici.Gibbs@seafood.co.nz](mailto:Nici.Gibbs@seafood.co.nz)

"Conservation is an essential part of any effective sustainable management regime. As with other management measures, conservation measures should be scientifically justified and "optimal" in a regulatory sense (i.e., the lowest-cost intervention to meet the management objective). It is artificial to consider conservation, when applied in this 'wise use' sense, as a separate use of the marine environment.

"However, the term 'conservation' often refers to, or is used to justify, the protection or preservation of an area or characteristic of the marine environment irrespective of any risks or adverse effects arising from other uses. In these cases conservation should be considered as a separate use of the marine environment. It is, in effect, a transfer of benefits from an existing set of (sustainable) extractive uses to a new set of uses and values. Reallocations of this type need to be negotiated with existing users so that the transfer is transparent and the resulting decision is economically efficient and socially acceptable."

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### Conservation is a restraint, not a use

#### Carl Safina

President, Blue Ocean Institute, East Norwich, New York, U.S. E-mail: [csafina@blueocean.org](mailto:csafina@blueocean.org)

"Conservation is not a use. It is a restraint that facilitates many kinds of use in perpetuity."

## Conservation is a use that underlies all other uses

### Barry Gold

Lead, Marine Conservation Initiative, Gordon and Betty Moore Foundation, Palo Alto, California, U.S. E-mail: [Barry.Gold@moore.org](mailto:Barry.Gold@moore.org)

"In the context of marine spatial planning, conservation should be considered a use of the marine environment. Critics of this view will argue that by relegating conservation to a use, it will be too easy to marginalize as just one use at the table. I would respond by saying that conservation is already seen as a special interest of conservationists and something that takes benefits away from other users. However, it is increasingly clear that adequate protection and maintenance of ecosystem function must underlie the ecosystem goods and services sought by many of these other ocean users. Unless scientists and practitioners can convince ocean users that conserving ecosystem structure and function is fundamental to obtaining the ecosystem goods and services people desire, our opportunity for progress is limited.

"A solid understanding of the cumulative impacts of human uses on the marine ecosystem is imperative within any marine spatial planning process. By considering conservation as a use within a marine spatial process, we provide stakeholders with a proactive approach that considers trade-offs between levels of conservation and other uses within an ecosystem goods and services framework. Such an approach can allow stakeholders to examine different portfolios of uses, the degree of sustained ecosystem function and resiliency they provide, and the sustainable wealth (aesthetic, cultural, and financial) from oceans that they create. The future of ocean management lies not in simply carving up the pie differently, but considering how uses are interdependent and the trade-offs that result from choosing one activity over another."

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## Conservation and nature need to be defined first

### Cora Seip-Markensteijn

Policy officer for nature and spatial planning, Dutch Fish Product Board, Netherlands. E-mail: [c.seip@pvis.nl](mailto:c.seip@pvis.nl)

"In principal, conservation and 'other' uses should be able to co-exist. However, if those other uses conflict heavily with intended nature conservation and no mutually beneficial solution can be found, then considering conservation as a separate use can be a solution. In that case, conservation and nature need to be defined first in order to be regarded as a use on their own. This raises the question of who will represent conservation. Should it be the government, or will it be left to nature organizations?"

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## Conservation proponents should view selves as users

### Fanny Douvere and Bud Ehler

UNESCO Initiative on Ecosystem-based Marine Spatial Planning, Paris, France. E-mail: [fanny.douve@mac.com](mailto:fanny.douve@mac.com) and [charles.ehler@mac.com](mailto:charles.ehler@mac.com)

"Conservation should be considered a use of the marine environment - a use that has spatial and temporal requirements. Proponents of conservation should recognize that the sea is heterogeneous and that some places are more important than others. Conservation often begins, for example, with the identification of biologically or ecologically important areas. However, no assurance exists that these important areas will be designated for conservation, or managed effectively over time.

"Conservation must be able to compete with traditional uses of the sea (including fishing and marine transport) and new uses (offshore wind farms, mariculture) in government processes such as marine spatial planning that are being used increasingly to plan and allocate space in marine areas. If conservation interests do not participate in the planning and allocation process as important users of the marine environment, they run the risk of being left out completely."

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## Whether conservation is a use depends on context

### Ian Ball

Australian Antarctic Division, Department of Environment, Water, Heritage and Arts, Tasmania, Australia; also the original developer of Marxan planning software. E-mail: [Ian.Ball@aad.gov.au](mailto:Ian.Ball@aad.gov.au)

"There are a number of reasons why it could be sensible to consider conservation a marine use similar to uses such as fishing or shipping. It is a management use with specific objectives that could be compatible with other uses such as tourism or types of fishing, depending on the conservation objectives.

"However, the specific effect of considering a separate use will depend entirely on the context of the management process being used. There are unique aspects to conservation that cannot be ignored. A one-year moratorium on fishing or tourism, for example, makes more sense than a one-year moratorium on conservation."

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