Marine Ecosystems and Management

International news and analysis on marine ecosystem-based management

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Launching Soon: New Online Forum for Ocean Planning

The team that produces MEAM and MPA News is creating a new website to help ocean planners and managers share knowledge more easily and in more ways, beyond just newsletters. It is scheduled to launch in a preliminary "beta" version in the coming weeks. We will notify you when it goes live. The project is funded by a grant from the Gordon and Betty Moore Foundation.

Among other features, the website will offer:

- A robust and searchable library of articles and reports on marine spatial planning, EBM, and marine protected areas
- Open discussion forums on a range of ocean-planning topics
- Live chats with experts
- Tool instructional videos and "office hours" for tool guidance
- Regular blogs by leaders in the field
- And more

The website will also be fully integrated with issues of MEAM and MPA News, including the ability for users to comment on each article.

We look forward to continuing to improve our service to you. Thank you for your support.

John B. Davis
Editor, MEAM and MPA News

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Serious Fun: Using Games to Advance Coastal and Marine Management

Games are often considered as simply a form of entertainment. However, they can play important roles in other activities as well. By applying an aspect of fun to education, for example, games can communicate messages in ways that pure instruction sometimes cannot. And by transforming problem-solving processes into games, novel solutions can often be found.

One of the best-known examples of this is from outside the marine field. In 2008, a team of biochemists and computer scientists from the University of Washington created Foldit (**http://fold.it**). Essentially a series of online puzzles, Foldit awards points to players for successfully "folding" protein structures into three-dimensional shapes. Scientific knowledge of these twisting structures, which are difficult for computers to model, can help drive an array of biochemical and biomedical discoveries. In a matter of days, Foldit players found the answer to a longstanding science puzzle, the structure of a protein important to AIDS research.

Not many games result in science breakthroughs like that. However, several games are being used in the coastal and marine management field to advance understanding of various strategies and concepts. MEAM briefly examines a few of these.

1. Marxan reserve design games

Purpose: To teach how Marxan works
www.uq.edu.au/marxan/resgame/index.html

When designing networks of marine reserves, planners typically face a challenge: they must protect various environmental features while minimizing the cost of that protection on resource users, like fishermen. Finding the right balance, the optimal solution, can be a complex process involving many ecological and social factors, and powerful software tools have been developed to support that process. Marxan, developed at the University of Queensland, is among the best-known of these tools.

Perhaps less well-known is that there are two games based on Marxan: one is used in classroom settings while the other is applied in planning workshops. The classroom game is a training tool

continued on next page

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MEAM

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for planners, focusing on the technical details of how Marxan works. The workshop game is a simplified version, giving stakeholders a chance to play with the tool and learn its basics. In both games, players compete to build a reserve system that protects all conservation features for the least cost.

"The games are useful in demonstrating the optimization algorithm and, to a lesser degree, reserve design concepts," says Matt Watts, research officer at the University of Queensland. He says he would like to see more games available as teaching tools. "The more blurred the distinction is between simulations [like Marxan] and games, the more engaging it becomes for the audience," he says.

For more information: Matthew Watts, Environmental Decisions Group, University of Queensland, Australia. E-mail: **m.watts@uq.edu.au**

2. Go Fish, No Fish

Purpose: To introduce the concept of catch shares
www.edf.org/oceans/catch-share-design-center/go-fish-no-fish

Not all games have to be played on computers, of course. The game Go Fish, No Fish, which simulates the downsides of unmanaged fishing, is played on a table top. Players use their choice of materials — candy pieces, toys, or whatever is available — to represent target fish, bycatch, habitat, and other ecosystem features. Then the players progress through a series of fishing seasons, experimenting with various management strategies like no-take areas, catch limits, trip limits, territorial user rights, and ultimately catch shares.

The Environmental Defense Fund (EDF), which developed the game, has played it with fishery managers, fishermen, NGOs, policy makers, scientists, and other opinion leaders around the world. "We have seen a range of behaviors exhibited: from participants who want to maximize their economic outcomes to ones who are more conservative about how much fish to take," says Ashley Apel of EDF. "Regardless, participants always learn new insights into sustainable fisheries management, fisheries economics, or the fishing industry in general." She points to Belize, where EDF played the game with key government decision makers and the majority of the Belizean fishing fleet. Following the game, she says, the fisheries management system in two areas was changed from open-access to managed access, with territorial use rights provided to selected fishermen.

The game can be tailored to the situation in which it is played — such as including locally managed no-take areas in the Western Pacific, for example, or problems with bycatch in the EU, says Apel. There are simple and complex versions of the game, too, depending on the audience and other factors. "Instructions on the website are written for people to lead a game on their own without prior experience," she says.

For more information: Ashley Apel, Environmental Defense Fund, San Francisco, California, US. E-mail: **ashleymapel@gmail.com**

3. Trade-Off!

Purpose: To help stakeholders explore trade-offs in marine spatial planning
www.seaweb.org/resources/ebm/SeaWebsEBMCommunicationsProject.php

The board game Trade-Off!, developed in 2008, aims to prepare coastal stakeholders for marine spatial planning processes. It highlights the types of decisions that are typically made during spatial planning, such as where to site compatible activities and how to separate conflicting uses. Players must negotiate these decisions while assuming the roles of various stakeholder groups — compelling them to consider the situation from points of view beyond their own. The game was designed by SeaWeb, an environmental NGO, in collaboration with the Integration and Application Network at the University of Maryland Center for Environmental Science in the US.

"Trade-Off! helps participants recognize that marine spatial planning rarely gets to build on a 'clean slate'," says Kathleen Reaugh Flower, who led the game design process at SeaWeb. "You must consider complementary activities in your plan, and compromises need to be made between stakeholders."

The game has been used in association with real marine spatial planning efforts around the world, says Daria Siciliano, who now oversees Trade-Off! for SeaWeb. She says that players typically exhibit an unwillingness at first to make concessions, but peer pressure from other affected players/stakeholders often spurs more accommodating solutions. "This could be analogous to what happens in real-life discussions," says Siciliano.

For more information: Daria Siciliano, SeaWeb, San Francisco, California, US. E-mail: **dsiciliano@seaweb.org**

4. Where Rivers Meet the Sea, & other games

Purpose: To encourage students to care for marine ecosystems
http://games.noaa.gov

The US National Oceanic and Atmospheric Administration (NOAA) has created an online gateway to more than two-dozen web-based games on marine environmental issues. The target audience is children in elementary and middle school, encouraging them to care for coastal and marine ecosystems. Examples of games include Where Rivers Meet the Sea, which challenges players to restore an estuary, and Sea Turtles and the Quest to Nest, in which players protect sea turtle nesting beaches.

"We have designed the NOAA Games website as a portal to many environmental games developed by federal agencies and their partner organizations," says Peg Steffen, education coordinator for NOAA's National Ocean Service. The abovementioned estuary and sea turtle games were developed by NOAA in partnership with Montgomery College, and were evaluated in 2011 for classroom use. In the study, teachers applied their traditional instruction methods on estuaries and sea turtles with one class, and with a comparable class used the games instead. The results showed the games were as effective for learning as the traditional instruction methods.

The NOAA-designed games intentionally feature careers that pertain to coastal and ocean sciences — the goal being to inspire students' interest in those career paths, says Steffen. "Digital games can be powerful tools to learn the skills to succeed in the new global economy and to promote knowledge and behaviors of future environmental stewards," she says.

For more information: Peg Steffen, NOAA, Silver Spring, Maryland, US. E-mail: **peg.steffen@noaa.gov**

SimIsle: A mainstream computer game that introduced the public to coastal management concepts

In the early 1990s, the videogame company Maxis had a major hit with its SimCity franchise: players designed cities from scratch and experienced an array of intended and unintended consequences in the process. Wanting to apply the successful model to other games, Maxis published one that remains the closest the mainstream gaming business has come to coastal management simulations: SimIsle. In it, the player manages a tropical island and must balance development and conservation to achieve various goals.

"SimIsle started out as a game idea called 'Eden' and I think that name points to my original intention to do a simulation of the rainforest and the tensions caused by development and deforestation," says Matthew Stibbe, who designed the game for Intelligent Games under contract to Maxis. "A friend of mine from university, who knew the subject well, prepared a detailed report on the rainforests of Borneo as a basis and inspiration for the game. I recognize some of its elements in the game such as ecotourism, deforestation, the interplay of salt and fresh water marshes, etc."

Later, says Stibbe, it became clear that islands were useful ways to package different game challenges for the player, as well as to bound the simulation to make it manageable. The game map became an archipelago and SimIsle was born, reaching stores in 1995.

"With a game like SimIsle the big requirement is to make the world believable, which is not necessarily the same as realistic," says Stibbe. "So actions such as chopping down rainforests, damming rivers, or building cities have understandable and, to some extent, predictable consequences. Testing and programming focused on creating a world where things behaved in interesting but internally consistent ways. We also spent a lot of time trying to make it entertaining and, although it sold pretty well, it wasn't a huge smash hit like SimCity so I guess we only partially succeeded."

Much has changed in game development since when SimIsle was created. In fact, some of the mathematical design strategies that Stibbe and his team considered using — but discarded for being too complex at the time — now provide the foundation for marine simulation tools like Marxan and other programs. Stibbe says if someone were to create a new, scientifically rigorous SimIsle today — as a training tool for coastal managers, for instance — it could be done fairly cheaply. "Twenty years ago, we did SimIsle in about 18-24 months at a cost of around US $400,000," he says. "You could do it today for much less."

For more information: Matthew Stibbe.
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Letters to the Editor

Streamlined permitting presents a trade-off for agencies

Dear MEAM,
Thanks for another interesting and useful issue. I am struck by what I think is an important connection between your April/May issue's discussion of trade-off negotiations, and Charles Ehler's insights on the myths and realities of marine spatial planning ("Perspective: 13 Myths of Marine Spatial Planning", MEAM 5:5). Dr. Ehler presents as myths the arguments that "MSP will replace single-sector management" (which, I agree, it will not) and "MSP will lead to more government regulations," where he argues that spatial planning should result in streamlined permitting.

I agree with Dr. Ehler in theory, but in practice I find streamlined permitting to be a very difficult outcome to achieve. I suggest the reason can be found in the lead article on trade-off negotiations.

Streamlined permitting does not replace single-sector management. By definition, however, it does require regulatory agencies to agree to limit their full review and permitting authority based on project type, spatial location, or some combination of the two. This is a form of trade-off negotiation. But it is one that the lead article seems to caution strongly against, because agencies are being asked to give something up with little or nothing to gain in return (from their perspective). Most agencies will agree that permit streamlining may be a good concept, but agencies' self-interest, inertia, and regulatory mandates are all pushing against it. Absent political pressure forcing them to the table, it is very difficult to get agencies to commit voluntarily to limit their permitting authority.

I suggest that unless permit streamlining is an explicit component of an MSP process from the beginning, with real agency commitment on that point, the "myth" that MSP will lead to more regulations is in fact correct: the MSP outcome will simply be layered on top of existing permitting authorities. I would also offer that successes and failures in reaching agreement among multiple agencies on streamlined permitting processes would be worthy of examination as a particular form of trade-off negotiations. I should note that my perspective comes from working on the California coast of the US.

Dan Berman
Dan Berman is Director of Conservation for the Humboldt Bay Harbor, Recreation and Conservation District in Eureka, California, US. E-mail:
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Ehler's response to Berman:

Dear Dan,
Thank you for your thoughtful comment on my summary of MSP myths. I agree with your observation that "unless permit streamlining is an explicit component of an MSP process from the beginning, with real agency commitment on that point, the 'myth' that MSP will lead to more regulations is in fact correct." However, experience in The Netherlands and Germany has shown that, in fact, permitting (known as "consenting" in Europe) can be streamlined when development proposals are in areas already identified (not necessarily "zoned") for development. Streamlined permitting is built into the MSP process in those examples.

Charles Ehler
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There are "points of no return" in economics and society as well

Dear MEAM,
I agree wholeheartedly with Tundi Agardy's preeminent lesson of "Avoid points of no return." ("Tundi's Take: In Trade-offs and Choices, There is One Simple Rule", MEAM 5:5) However, all of her points of no return are ecological ones. After more than two decades of working with social scientists, I am finally waking up to the fact that not only have the economic sciences long had points of no return (like bankruptcy) but so do sociology and anthropology. I think the reason the inshore fisherfolk of Newfoundland and Labrador (Canada) fought so hard against the major quota reductions being advised for cod as early as 1988 (four years before the moratorium) was their intuitive belief (much later documented by social scientists studying the system) that their communities and culture had points of no return as well. That is, there would be a loss of work opportunities and emigration of young people that would transform their communities into near-ghost towns and their culture into little more than the substance of folk songs and yarns told by grandparents.

This is the real challenge of achieving "sustainability" — that there are non-linearities to regions of irreversible change not just on the ecological dimension of sustainability but on the economic and social dimensions as well. Governments and social systems can provide alternatives to those who pay the direct costs when points of no return are exceeded on the social and economic dimensions in ways that cannot be done for costs on the ecological dimension. However, many can (and do) argue that there is little real

difference between asking society to accept making residents of coastal areas adapt to fundamentally different lifestyles, lacking many of the things that gave their lives most meaning, and asking society to adapt to fundamentally different ecosystems that still do have some structure, function, and productivity — just different kinds and levels of each.

Personally I have not abandoned my conviction that the points of no return on the ecological dimension do matter the most. But I have lost my hubris that that is the only rational way to look at the situation — or the trade-offs.

Jake Rice
Jake Rice is senior national advisor for ecosystem sciences with Canada's Department of Fisheries and Oceans, Ottawa, Canada. E-mail: **Jake.Rice@dfo-mpo.gc.ca**

Tundi's Take: My "desert island" publications on marine EBM

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

The long-running BBC radio program Desert Island Discs asks public figures what things — including musical choices, a book, and a luxury item — they would take with them to a deserted island. The program has inspired many similar challenges over the years.

I was recently asked to make a list of what I considered to be the top 10 publications on ecosystem-based management, and for fun I envisioned it as a desert island list. Granted, the thought of being on a deserted isle with only books on EBM to read may seem less than thrilling. However, the following library would amply support the creation of a robust management framework around the island in the reader's free time.

I have listed these publications in no particular order:

- *Taking Steps Toward Marine and Coastal Ecosystem-Based Management: An Introductory Guide* (UNEP, 2011)

Incidentally, of all the publications on this list to have on a desert island, the *Taking Steps* guide is the one that could truly provide entertainment as well as information. The guide's images are attractive and the conceptual diagrams are outstanding. I understand that a second print run and improvements to the hardcopy layout are coming soon.

- *Ocean and Coastal Ecosystem-Based Management: Implementation Handbook* (Environmental Law Institute, 2009)
- "Integrated Ecosystem Assessments: Developing the Scientific Basis for Ecosystem-Based Management of the Ocean" (Levin et al., *PLoS Biology*, 2009)
- "Marine Ecosystem-Based Management in Practice: Scientific and Governance Challenges" (Ruckelshaus et al., *BioScience*, 2008)
- "Marine ecosystem-based management: from characterization to implementation" (Arkema, K.K., S.C. Abramson, and B.M. Dewsbury, *Frontiers in Ecology and the Environment*, 2006)
- *Great Barrier Reef Outlook Report 2009* (Great Barrier Reef Marine Park Authority, 2009)
- *Marine Spatial Planning: A Step-by-Step Approach Toward Ecosystem-Based Management* (Ehler, C. And F. Douvere, UNESCO, 2009)
- "Ecosystem-based marine spatial management: Review of concepts, policies, tools, and critical issues" (Katsanevakis et al., Ocean and Coastal Management, 2011)
- *Ocean Zoning: Making Marine Management More Effective* (Agardy, T., Earthscan, 2010)
- *Ecosystem-Based Management for the Oceans* (McLeod, K. and H. Leslie eds., Island Press, 2009)

For a version of this essay with weblinks to all of the publications, go to **www.MEAM.net/MEAM25.html#Tundi**

Crafting an Argument for Ocean Planning? Consider How Aristotle Would Do It

Success in management often comes down to convincing people to behave a particular way. Provide a persuasive argument and your audience is more likely to follow your suggestion. Provide an unpersuasive argument…good luck.

That may seem like simple advice, but crafting a convincing argument is as much art as science. Ask any manager who has entered a public meeting thinking, "If we just reason with the audience, they will agree our plan is the right one." Relying on pure logic and appealing only to the audience's heads can sometimes get you nowhere. That is just the way people are.

The art of persuading and motivating audiences is known as rhetoric, and several of its basic rules were laid down in ancient Greece by Aristotle. The rules apply just as well today as they did 2500 years ago. In the field of ocean planning, they may hold real value for those trying to convince others of the need for particular management measures — whether the audience to be persuaded is the general public, stakeholders, or even bureaucratic agencies themselves.

The gist of Aristotelian rhetoric is that there are three powerful tools of persuasion:

- *Logos*, appealing to the listeners' logic;
- *Ethos*, appealing to their character; and
- *Pathos*, appealing to their emotions.

Although ocean planners might assume *logos* is the most powerful of these tools — "If we just reason with the audience…" — it turns out it is often not. Sometimes an effective argument uses all three tools.

For more information:
Jay Heinrichs,
New Hampshire, US. Web:
www.**figarospeech.com**

Jay Heinrichs travels the world teaching Aristotelian rhetoric to companies, government agencies, and other institutions. *BusinessWeek* magazine profiled him this past March (**www.businessweek.com/articles/2012-03-14/jay-heinrichss-powers-of-persuasion**) and his 2007 book *Thank You for Arguing* was a business bestseller. He also writes two blogs, Word Hero (**www.wordhero.org**) and Figaro Speech (**www.figarospeech.com**), on effective communication. MEAM asked Heinrichs for his thoughts on applying Aristotle's lessons to the ocean-planning field:

In the US, the federal government has initiated a region-by-region process of coastal and marine spatial planning for US ocean waters. According to the government, this process will "decrease user conflicts; improve planning and regulatory efficiencies and decrease their associated costs and delays; and preserve critical ecosystem function and services" — an argument that seems fairly *logos*-based. How would you make an argument in support of the marine spatial planning process?

Jay Heinrichs: The analogy is your best method here, I think. But not a conservation-based analogy. You might want to talk about the need to avoid "collisions" of competing uses, with the process being a kind of virtual "traffic cop". This is more or less a *logos* approach, but one that uses an audience's existing comfort with the need for regulation on streets. If that language seems too informal, imply the traffic analogy with frequent use of the words "colliding" and "potential collision".

Pathos generally isn't appropriate in this formal context. And *ethos* can be tricky unless there's a trusted spokesman or representative who can speak for the initiative in terms the audience is comfortable with.

Overall, the focus should not be on regulation or "planning" so much as on the need for efficiency and for maximizing the use of marine resources over time. I always liked the approach of Gifford Pinchot, founding head of the US Forest Service, who spoke for the "greatest good, for the greatest number, over the greatest time."

You might also consider using the word "conservative" to support your argument. It is conservative to streamline regulations. And it is conservative to seek the orderly maximization of resource use over time.

The regional planning processes in the US will be run by administrators and scientists who are largely untrained in negotiating with the public. What exercises can you recommend for these people to help them develop their balanced arguments?

Heinrichs: I conduct workshops that last at least half a day, in which we rehearse the arguments and anticipate the other side's language. My immediate advice would be to avoid sounding clever. Instead, look for analogies and other figures of speech that please the persuadable audience. In my workshops, I teach the art of the *synecdoche*: taking a pleasing part of something and making it represent the whole. But that's a complicated tool that needs some explanation. This stuff is not easy.

The term "marine spatial planning" itself may not resonate particularly well with *ethos* or *pathos* thinking. Should stakeholders be expected to agree to tradeoffs in the name of good "marine spatial planning", or would you recommend another term be used?

Heinrichs: I would strongly recommend an informal term to supplement "marine spatial planning". The word "planning" smacks of bureaucracy and interference with free markets. "Enhanced mapping" or "active mapping" might be easier to swallow. In my work, I look for the least controversial part of an issue and use that as a basis for branding and labeling. M

Notes & News

Presentations from International Marine Spatial Planning Symposium available online

Thirty presentations from the International Marine Spatial Planning Symposium — held 14-16 May 2012 in Rhode Island, US — are available online at **seagrant.gso.uri.edu/baird/2012_marineplanning/2012_marineplanning.html** . The meeting brought together MSP practitioners from 10 countries to share their experience and best practices. It was co-hosted by the University of Rhode Island/Coastal Resources Center, Rhode Island Sea Grant College Program, and the Rhode Island Coastal Resources Management Council.

UN publication summarizes theory and practice of marine spatial planning

A new publication by the Scientific and Technical Advisory Panel of the Global Environment Facility provides a summary of marine spatial planning experience worldwide, including available tools, barriers to MSP use, and innovative methods. Drawing from examples, the report discusses the potential such planning has — "as yet not fully realized," according to the authors — to align conservation and development interests while protecting vital ecosystems and the services they deliver.

Although officially still in draft form, the document is available to the public. Prepared in support of the Conference of the Parties to the UN Convention on Biological Diversity, the *Synthesis Document on the Experience and Use of Marine Spatial Planning* is at **www.cbd.int/doc/meetings/sbstta/sbstta-16/information/sbstta-16-inf-18-en.pdf** .

Global analysis of value and management of forage fish populations

A new report provides the first global estimate of the total economic value of forage fish to commercial fisheries, including their indirect "supportive" value when left in the ocean. Forage fish are small schooling fish such as sardines and anchovies; they play a central role in marine food webs as prey for larger fish, seabirds, and marine mammals.

Produced by the Lenfest Forage Fish Task Force (a team of scientists funded by the Lenfest Foundation), the report concludes that, globally, forage fish are twice as valuable in the water as in the net. That is, the supportive value of forage fish left in the water as food for commercially valuable predators is US $11.3 billion annually, compared to a direct catch value of $5.6 billion. Noting that the direct and supportive values can vary significantly by region, the report recommends a method that managers can use to assess the relative values, and management tradeoffs, for their own area. The report *Little Fish, Big Impact* is available at **www.lenfestocean.org/foragefish** .

Audit of Mesoamerican Reef management sets baseline, finds some successes

An evaluation of programs to protect and manage the coral ecosystems of the Mesoamerican Reef — which provides a diverse array of goods and services to Belize, Guatemala, Honduras, and Mexico — cites some success stories while acknowledging an overall decline in reef health. The "eco-audit" incorporated 22 management indicators within seven themes, such as fisheries management and coastal zone management, and drew input from government agencies, NGOs, and businesses. The eco-audit is intended to be repeated every two years. Conducted by the Healthy Reefs Initiative and the World Resources Institute, the evaluation is available at **www.wri.org/publication/2011-eco-audit-mesoamerican-reef-countries** .

Book on valuing ecosystem services at local and regional levels

A new book produced by The Economics of Ecosystems and Biodiversity (TEEB) study, an international initiative to draw attention to the global economic benefits of biodiversity, outlines how valuations of ecosystem services can be applied to local and regional management efforts. Among other features, the book

describes the rationale for valuing ecosystem services, methods for doing so, and how payments-for-ecosystem-services systems can be designed. *The Economics of Ecosystems and Biodiversity in Local and Regional Policy and Management*, published by Earthscan, costs US $84.95 and is available at **www.routledge.com/books/details/9781849712521** . Other TEEB publications, including some free ones, are available at **www.teebweb.org** .

Report describes framework for responsible coastal tourism development in Mexico

A new report by the Center for Responsible Travel outlines strategies to ensure coastal tourism development in Mexico is conducted in an environmentally sustainable manner. Describing the potential environmental impacts of various facilities (coastal resorts, retirement homes, marinas, and golf courses), the publication offers guidance on the responsible development and operation of each, as well as case studies to illustrate good practices. The 102-page report *Alternative Development Models and Good Practices for Sustainable Coastal Tourism: A Framework for Decision Makers in Mexico* is at **www.responsibletravel.org/resources/documents/reports/Alternative%20Coastal%20Tourism%20in%20Mexico.pdf** .

New study analyzes value of preventing further harm to oceans

The chemical and ecological foundations of the ocean are being jeopardized by human activity, putting at risk ecosystems on which humans depend, concludes the preview of a forthcoming book that analyzes the economic value of preventing further harm to the oceans. Based on research by the Stockholm Environment Institute, the book analyzes six categories of damages that can be priced meaningfully and affected realistically by policy decisions taken today and in coming decades: acidification, ocean warming, hypoxia, sea level rise, pollution, and overuse of marine resources.

"The services provided by the ocean are immensely valuable but inadequately integrated in national, regional, and global economic analyses and plans," states the book's preview executive summary. "The ocean is the victim of a massive market failure and dilution of political will, with devastating consequences for its ecosystems and the billions of people dependent on them." The 11-page preview summary of the book *Valuing the Ocean* (available at **www.sei-international.org/publications?pid=2064**) was released to inform preparations for the Rio+20 Earth Summit; the full book will be published later this year.

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

The EBM Toolbox by Sarah Carr

Are you headed to Oakland for the Society for Conservation Biology's North America Congress in July 2012?

Join the EBM Tools Network for "Tools for Planning for Climate Change in Coastal and Marine Ecosystems"

This symposium (to be held Tuesday, 17 July, from 11 am to 1 pm PDT) will highlight multi-sectoral tools and approaches for assessing and reducing the vulnerability of coastal ecosystems and infrastructure to climate change. We will start with an overview of the Climate Adaptation Knowledge Exchange (CAKE; **www.cakex.org**), an online information source and community for climate change adaptation, and an overview and analysis of currently available tools for climate change planning from the EBM Tools Network (**www.ebmtoolsdatabase.org/resource/climate-change-tools-matrix**). Then we will move to overviews of:

- NOAA's Roadmap for Adapting to Coastal Risk (**www.csc.noaa.gov/digitalcoast/training/roadmap**), a methodology that guides users through hazard identification and social vulnerability assessment
- NatureServe's Toolkit Approach to Integrated Vulnerability Assessment and Adaptation Planning (**http://ebmtoolsdatabase.org/resource/webinar-presentation-integrating-climate-vulnerability-assessment-and-adaptation-conservati**), an approach for developing adaptation alternatives at a landscape level
- ClimSystems' SimCLIM (**www.climsystems.com/simclim**), a tool for generating scenarios of impacts from and adaptations to climate variability and change
- Natural Capital Project's InVEST (**www.naturalcapitalproject.org/InVEST.html**), a tool for evaluating the effects of climate and adaptation on ecosystem services
- PRBO's Our Coast Our Future (**http://data.prbo.org/apps/ocof**), a tool for addressing the vulnerability of the San Francisco Bay Area shorelines to climate change.

Contact me at **sarah_carr@natureserve.org** for more information.

Sarah Carr is coordinator for the EBM Tools Network. Learn more about EBM tools and the EBM Tools Network at **www.ebmtools.org** .