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In US, Marine Spatial Planning Process Enters Regional Phase; Federal Role Is Reduced from Original Plans ^[2]

In 2010, President Barack Obama signed an executive order establishing a national ocean policy for the US. Among other actions, the policy called for a national process of coastal and marine spatial planning (CMSP), which would be carried out on a phased basis across nine regional planning areas ([MEAM 4:1](#) ^[3]). In the months since then, a federal interagency National Ocean Council - also established under the executive order - has developed a basic framework to help agencies at all government levels implement the policy, including the marine planning process.

That planning process is now entering its regional phase. Each region is tasked with building an intergovernmental planning body consisting of federal, state, tribal, and local representatives. In turn, each body will be responsible for developing its own set of regional goals, objectives, and, ultimately, regional spatial plans.

Based on the size of area involved (the US has the world's largest Exclusive Economic Zone), the nation's process of CMSP could be considered the most ambitious program of its kind. It has encountered both political and practical challenges. Political opponents of the planning process have charged it will lead to zoning of the oceans, thus limiting current activities, and have worked to eliminate federal funding for implementation. (For their part, Obama administration officials state the marine planning stops short of zoning [\[MEAM 4:4](#) ^[4]]). Facing funding limitations and other factors, the National Oceanic and Atmospheric Administration (NOAA), one of the lead agencies comprising the National Ocean Council, restructured its approach for a coastal and marine spatial planning program.

Although the CMSP process was viewed from the start to be primarily region-based, the reduced federal role may make the process even more decentralized than originally envisioned. Indeed, the nine regional plans could look significantly different from each other in terms of priorities and outcomes.

In this issue, MEAM talks with two planners about the process ahead:

- **Jessica Kondel**, marine planning coordinator for NOAA; and
- **Captain Eric Vogelbacher**, chief of planning and resources for the US Coast Guard Ninth District, who helps lead the Great Lakes regional planning process. (The Great Lakes region, which borders Canada, is one of the nine regions included in the US coastal and marine spatial planning process.)

Why was NOAA's coastal and marine spatial planning program disbanded last November, and has this affected national and regional CMSP work going forward?

Jessica Kondel: Both the change in the fiscal outlook from just a few years ago and changing understanding of the program needs have caused NOAA to redesign its CMSP Program. Instead of a formal program, NOAA is working within existing programs, scientific capacities, and ocean management authorities to support regional marine planning efforts by integrating and providing access to ocean and coastal data for transparent, science-based decision-making. NOAA's efforts, coupled with those of other federal agencies and regional, state, local, and tribal governments - as well as stakeholders, industry, and other partners - will support marine planning as a tool to better inform and guide decision-making that affects economic, environmental, security, social, and cultural interests.

Eric Vogelbacher: The question mentions the disbanding of NOAA's CMSP program, but people need to realize that this was not a massive core capability - just a few staff whose management activities have been integrated effectively into existing programs. NOAA consistently has been a dedicated and vigorous champion for implementing CMSP, both nationally and regionally, and I don't see this relatively minor adjustment affecting the vital support that they provide. Federal agencies are implementing the National Ocean Policy "out of hide", or within existing appropriation levels. This is mostly because the policy is seen as an effort to better coordinate existing responsibilities, switching from reactive processing of permit applications to becoming proactive, and creating a framework or master plan in which the permit applications can be handled more easily and with better context and information.

What does the process look like at the regional level right now?

Vogelbacher: CMSP is viewed as being largely in the hands of the regions, which will tailor planning efforts - in focus, form, and level of effort - to meet their specific regional needs and priorities. While the region has lots of leeway, we are eagerly anticipating the overarching program guidance that the National Ocean Council will be providing. They are wrapping up work on the National Ocean Policy Implementation Plan [released in draft form last January: www.whitehouse.gov/administration/eop/oceans/cmstp ^[5]] and a *Handbook for Regional Coastal and Marine Spatial Planning*. The implementation plan went through extensive public comment and policy review and is set to be released in the next month or so. We also anticipate that much of the handbook will be available soon. These will provide a comprehensive framework to facilitate coordinated planning.

In the Great Lakes region, there is much excellent marine planning work going on, but as far as a comprehensive systematic CMSP approach, we are still just taking initial steps. The federal partners of the Great Lakes Regional Planning Body have been meeting by phone regularly since December 2011, discussing ongoing projects and initiatives. State and tribal governments are currently identifying their points of contact who will be able to enter the dialogue to decide how best to tailor CMSP efforts for our region, especially in leveraging the many fine collaborative groups that already exist. Everyone is concerned with workload, but since none of the existing groups deal specifically with CMSP, we are seeing real value in organizing a team with this mission at its core. Still, we hope to design the team to have low overhead, taking advantage of existing relationships.

Once the team is established, we will follow the implementation plan and the handbook as appropriate for the region. Early steps will determine the region's priorities, assess

CMSP capacity, and work to close gaps in CMSP training. We have a good idea about the region's priorities, but need to hear from the state and tribal governments and stakeholders, since they are all central to this process. When we have our priority list and complete the capacity assessment, we will be able to determine the scope of what we can and want to tackle.

What are the main challenges facing the CMSP implementation process at this point?

Kondel: One of the current challenges we face is effectively communicating the goals and the benefits of regional marine planning in the United States. There are still concerns by many that they will not have a voice in the planning process, that the outcome will be a large-scale restriction of ocean uses, and that marine planning will create additional regulatory and permitting burdens. Because the ocean policy relies on existing authorities, we do not envision additional regulatory burdens.

Stakeholder engagement in the marine planning process will be instrumental to its success in any region. One challenge will be for each of the regions to develop mechanisms to ensure all relevant stakeholders are able to have meaningful input throughout the planning process. The handbook being developed by the National Ocean Council will provide guidance to the regional planning bodies on how they might want to approach stakeholder and public engagement to support a successful planning process.

Today's fiscal climate is challenging. This is why it is more important than ever to leverage existing resources and prioritize use of funds among projects and programs. Through regional marine planning, we will be able to identify and address regional priorities by applying and leveraging the limited resources available to address some of the key challenges facing the ocean, coasts, and Great Lakes.

After the CMSP process for the Great Lakes is completed, do you expect it will result in some sort of zoning system for the region's waters?

Vogelbacher: Zoning is a concept that many people unnecessarily relate with overly burdensome restrictions on uses. In fact, you could have large zones of unrestricted use. Ultimately, the region will decide what approach makes sense. Whether it is called zoning or something else, it would really surprise me to see a plan that cut up the entire Great Lakes into zones that significantly limit activity. What seems more likely is the continued - but better coordinated - establishment of limited-use areas and protected areas to deal with specific concerns developed from a regional perspective.

For instance, to protect and preserve historic shipwrecks the Thunder Bay National Marine Sanctuary prohibits bottom drilling and dredging. It seems to make sense to expand the sanctuary to include the large number of additional shipwrecks that have been discovered near, but outside of, the existing boundaries. In another example, a new rule has been proposed to expand the areas where discharge of dry cargo residue is prohibited, providing an effective spatial restriction on an activity and decreasing the impact on the environment.

I also anticipate the identification of areas where offshore wind production would make sense. Sited in areas of maximum wind potential and away from conflicting uses, such as shipping lanes, such a plan would both encourage industry to make use of the sites and streamline the permitting process. In addition, dedicated areas could include consolidated transmission corridors to bring power ashore. These examples reflect the reality that as better information becomes available, we can make better management decisions about how we use different parts of the Great Lakes. As the regional CMSP effort gains momentum, we will be able to make these decisions as part of a comprehensive picture.

As we engage with the state and tribal governments and the other regional stakeholders including industry, the public, and environmental groups, we will see what other drivers need to be addressed. Dead zones due to algae blooms are a high priority for Lake Erie. Water quality, fish habitat, and wetlands are concerns in other parts of the region. Four different hydrokinetic turbine projects are being pursued and at least one group is close to submitting a request for an offshore wind farm in the Great Lakes. CMSP should be able to help with all such challenges and opportunities.

Some other uses just need to be spatially mapped out and maintained. We plan to accomplish this through the use of a geographic information system (GIS) database. Shipping, for instance, is a primary source of jobs and economic prosperity for both the US and Canada. So the areas needed for the maritime transportation system should be accounted for and fenced off, helping ensure we retain free access through the vital network of canals, shipping lanes, and ports. This does not mean that shipping would be limited to only these specific areas; rather, any attempt by other users to develop or use the shipping areas in a non-complementary manner would be scrutinized and would be unlikely to receive approval unless they include an acceptable mitigation strategy. My expectation is that most of the areas in the Great Lakes and associated waterways will not have significant restrictions on legitimate uses.

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Tundi's Take: Circling Back to Hawaiian EBM ^[6]

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

I recently had the great pleasure of addressing the Hawai'i Conservation Alliance on the occasion of its 20th anniversary conference. In preparing for that speech, I learned much about how EBM is approached in the Hawaiian Islands, comparing that to trends and emerging developments around the world.

The global trends that I highlighted were largely negative: large-scale environmental change; accelerating consumption and its consequences; ecosystem imbalances and regime shifts; ever-increasing specialization in the sciences that impedes generalist, holistic understanding; and a general trend toward entropy and apathy as the scale and complexity of challenges grow to make us feel helpless and render us incapacitated.

But in Hawai'i, communities, academic institutions, and government agencies are bucking the trends. While the archipelago is indeed affected by global scale environmental change, Hawai'i's fortunate geography makes it less at risk from global warming, and also creates opportunities for learning about environmental phenomena in the natural lab that the islands (and nearby ones like Palmyra Atoll) present. This enlightenment about global change and what can be done to increase resilience of marine systems to it are exported to places struggling to understand the environmental changes occurring in their own backyards.

Though tracking global trends in economic growth and increasing consumption, Hawaiian islands like Oahu are also trying to mitigate the effects that consumption has on coastal and marine environments. For example, the city of Honolulu is committed to smart growth, and people like former mayor Jeremy Harris have shown leadership in engaging cities and municipal governments in energy efficiency and adaptation to climate change.

Regarding ecosystem imbalances, agencies in Hawai'i are practicing true ecosystem-based management, ratcheting down on uses that cause systems to spiral toward critical thresholds - whether caused by tourist over-use, fishing, or coastal development. Once degraded areas are now being restored, such as in Hanauma Bay Nature Preserve on Oahu.

It is hard to buck the trend in increasing hyper-specialization in the sciences - and anyway, many people would consider that a positive, not negative, development. Specialized knowledge has sprung forth from these islands: indeed, Hawaiian academic institutions have been contributing to the body of knowledge about marine and coastal systems at levels disproportionate to their size and number of researchers. But Hawaiians have learned the value of supplementing specialized scientific knowledge with traditional knowledge, and this has allowed the development of much more holistic, generalist views of how interconnected habitats and ecosystem components (including human beings) interact. Maybe this mindset is more natural in island environments but it does require a certain openness among scientists to what they might consider alternative knowledge bases, and use of a common language between scientists and non-scientists.

A conservation ethic

The scale of coastal and marine management challenges in Hawai'i is daunting, but widespread apathy and entropy are countered by a growing conservation ethic that rests on empathy: empathy for nature, and empathy for fellow human beings. Sure, not all is rosy in Hawai'i. Infighting among environmental groups, management agencies stretched to their limits (with the bulk of resources going to control of invasive species, which is a huge issue for the archipelago), and occasionally erupting social unrest all represent challenges. But as the huge attendance at the Hawai'i Conservation Congress attests (more than 1000 attendees, with a quarter of those being young professionals), there is a tendency toward information sharing, speaking to one another, and working together to meet common goals.

The examples of how this all translates into Hawaiian-style EBM are evident in small initiatives and large management regimes alike. On the small end of the spectrum, the traditional watershed management practice of Apuhua'a - whereby crops are sustainably grown upland, and water that drains from those agricultural areas then flows downstream to fishponds that then filter pollutants before they reach the sea - is a prime example of EBM in Hawai'i. At the other end of the spectrum, the management planning taking place at the 362,000-km² Papahānaumokuākea Marine National Monument and World Heritage site is capitalizing on the Hawaiian attributes to show how true EBM can happen at large geographic scales. In between, the conservation community of Hawai'i illustrates to the world how, by circling back to traditions and tried-and-true ways of problem-solving, society can move forward successfully.

Perspective: Fisheries Research Needs to Change Course ^[7]

By Andrew Johnson, Bangor University

Editor's note: Andrew Johnson is a recent graduate of the University of Bangor (UK) with a Ph.D. in marine ecology.

Governments and scientists invest significant money and time every year in trying to understand where fish live and why, for the purpose of informing fisheries management. But it turns out that the research, as it historically has been conducted, is too often neglecting some very important factors.

Recently at Bangor University (UK), a review of fisheries literature revealed that research in the field of demersal fish habitat determination may benefit from changing direction (www.thefishsite.com/articles/contents/demfisheriesmay12.pdf ^[8]). Namely, if we are to successfully and sustainably manage our marine fish stocks, it is essential that fisheries scientists and managers better understand the link between fish populations and habitat as well as the spatial scales over which these relationships occur. The development of sound, predictive science in the field of demersal fish habitat determination - particularly in the context of informing conservation efforts - will require a reduction in study scale and an integration of biotic habitat variables.

By analyzing the results of over 100 peer-reviewed studies since 1976, my research team demonstrated that many studies tended to be spread across large areas of ocean ($\geq 100\text{km}^2$) and focus on the physical (abiotic) properties of habitat such as depth, sediment type, and salinity. Many therefore neglected small spatial scale associations and important biological (biotic) habitat variables like prey resource, predation, and competition between fishes.

Bias toward large areas, abiotic variables does not serve local-scale conservation or fisheries management

The common use of abiotic habitat variables is likely to be related to the ease with which such data can be gathered and the numerous annual scientific and commercial fishery surveys that operate over large sea basin scales. The collection of biotic data on the other hand often relies on time-consuming methods such as visual censuses and the analysis of whole marine communities. Analyzing fish stomach contents and seafloor communities, for example, can provide information about food web dynamics and the often-overlooked habitat variables of predation, prey resource, and competition.

Granted, the planning and management of large areas - including enormous MPAs designated in the Chagos archipelago (640,000 km² in area) and Kiribati (408,000 km²) - may benefit from research that focuses on abiotic habitat variables over larger spatial scales. However, area closures to manage fish stocks and marine biodiversity are more typically implemented over much smaller spatial scales. The UK, for example, is currently planning a coherent network of MPAs, and few of these areas match the common scales noted in our study. It is important that we increase the number of studies analyzing the relationship between fish and habitat at small spatial scales and the number of biological variables integrated in analyses if future management strategies plan to use findings from these studies in the design of smaller-scale MPAs.

Our analysis also showed a significant lack of studies looking at the relationship between fish and habitat over time. This is an especially important consideration for species whose habitat preferences change significantly with life stage development (e.g., juvenile to adult development) or for migratory species that may move in and out of already established management areas. If a species is known to migrate to a spawning ground every spring, for example, it is important not only to study the annual patterns of habitat association but also the finer time scale changes in habitat preferences during the important migration and spawning period. If this is neglected, management plans set up to close fishing in migration corridors and areas suitable for spawning may incorrectly assign closures to substandard spawning grounds, reduce fisheries productivity, and fail to protect spawning stock biomass during the spawning period.

If a more temporal approach is taken, it means that scientists can also begin to understand how fish habitat associations change over longer time scales. This will allow management to evaluate current practices more thoroughly and adapt them to reflect changes in fish stocks, climate, and so forth.

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Perspective: In the Coral Triangle Initiative, Is Support Filtering Down to MPAs and Local Practitioners? ^[9]

By Alan White, The Nature Conservancy

Editor's note: Alan White is senior scientist for the Asia-Pacific Program of The Nature Conservancy. He is also a member of the Coral Triangle Support Partnership, a consortium of WWF, Conservation International, and The Nature Conservancy. The partnership is funded by the Regional Development Mission in Asia of the US Agency for International Development (USAID).

In May 2009, the governments of Indonesia, Malaysia, Papua New Guinea, the Philippines, Solomon Islands, and Timor-Leste signed the Coral Triangle Initiative Declaration on Coral Reefs, Fisheries, and Food Security (CTI-CFF). CTI-CFF is a multilateral partnership that aims to safeguard the marine and coastal resources of the Coral Triangle region. Under the CTI-CFF, the six Coral Triangle countries collectively adopted a Regional Plan of Action, which was soon followed by each country's adoption of a CTI-CFF National Plan of Action that aligns with the goals of the regional plan. More than US \$100 million in multi-year grants has been committed by various international donor agencies to directly support implementation of the Coral Triangle Initiative.

The Regional Plan of Action is organized around five goals, each supported by a technical working group chaired by one of the six countries:

1. Priority seascapes designated and effectively managed (chair: Indonesia)
2. Ecosystem approach to management of fisheries and other marine resources fully applied (chair: Malaysia)
3. Marine protected areas established and effectively managed (chair: Philippines)
4. Climate change adaptation measures achieved (chairs: Indonesia and Solomon Islands)
5. Threatened species status improving (chair: Philippines)

The technical working groups include national representatives from each country and various partners that provide technical and financial assistance, including USAID, the

government of Australia, the Global Environment Facility, and the Asian Development Bank. The Regional and National Plans of Action contain indicators and targets for each of the five goals at both the regional and national scales that are to be accomplished by 2020.

MPAs are clearly supported within the CTI: goal #3 includes a target to "establish and make fully functional by 2020 a Coral Triangle Marine Protected Area System (CTMPAS)." The MPA Technical Working Group on which I serve is designing the CTMPAS framework, where each country will contribute qualified MPAs to a region-wide system of MPAs. Criteria under consideration for determining qualified MPAs include meeting minimum standards for effective management, addressing core biodiversity issues, fulfilling fisheries and climate adaptation needs, and, where appropriate, providing key connectivity linkages within the larger MPA system. A projected benefit of the CTMPAS is that it provides an incentive for each country to elevate its standards for MPA design and management so that its MPAs will qualify for inclusion in the system.

But some might ask whether any of the CTI system or the CTMPAS provides support to local MPA and EBM practitioners, particularly in the form of funding. The answer to this comes down to the tradeoffs between national or regional programs versus focusing at the local level. In fact, the CTI does work at many levels. However, the reality is that it does not necessarily increase funding for all local areas.

Initially focused on sharing knowledge among nations

This is because CTI, at least initially, is not set up to increase funding for all local areas. In its development stage, the CTI is focused on linking the countries to share their lessons, expertise, approaches and limitations so that at the regional and national levels, there is more consistency and a more common understanding of the issues and their solutions. Plus, it is a young regional program and the overall coordination mechanism, the CTI Secretariat, is not yet fully ratified by the countries.

On the positive side of support to local practitioners and MPAs, funding is provided for particular "integration sites" in each country. At these sites, MPAs and networks of MPAs are being designed to address multiple objectives that include fisheries management, biodiversity conservation, and climate change concerns in a manner that builds resilience. These integration sites, mostly supported by the USAID-supported Coral Triangle Support Partnership, are building capacity within communities and local governments to implement large and small MPA networks. These networks will factor in social, economic, and governance aspects necessary for long-term sustainability. In addition, several new large projects are just beginning to support more field programs with funding from the Asian Development Bank and the World Bank in addition to the ongoing programs under The Nature Conservancy, World Wildlife Fund, and Conservation International, among other NGOs working in the region.

Thus, while local project-support mechanisms exist, the Coral Triangle is a very large area and contains various levels of complexity to accomplish effective marine resources management and food security. It is a tall order to achieve the overall goals of the CTI in a few years and much of the success will rest on the ability, motivation, and political will of the national and local governments involved and their levels of capacity and funding from internal sources.

The original vision of large-scale financial support due to the creation of the CTI has not played out as some would like. But in the larger scheme of things, there is a tremendous amount of attention being given to marine conservation and coastal management in the region and CTI is pushing that along at a faster pace than otherwise would be expected. In fact, the CTI is quite a remarkable program whereby the six countries have banded together to protect and manage their incredible diversity of marine resources. These countries are committing their own resources to help accomplish this and it is no small undertaking. The CTI is moving and growing and, with time, intends to be a showcase for marine conservation.

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BOX: Other sources on Coral Triangle Initiative

Official website

www.coraltriangleinitiative.org ^[10]

Coral Triangle Atlas, within ReefBase

<http://ctatlas.reefbase.org> ^[11]

US Support to the Coral Triangle Initiative

www.uscti.org ^[12]

Coral Triangle Support Partnership

www.usctsp.org ^[13]

Reefs at Risk Revisited in the Coral Triangle (World Resources Institute, July 2012)

www.wri.org/publication/reefs-at-risk-revisited-coral-triangle ^[14]

Notes & News: Ocean Health Index - EBM case studies - EU marine spatial planning - Shifting baselines - UN Oceans Compact ^[15]

Ocean Health Index scores marine ecosystems on sustainability of services

A new measurement called the Ocean Health Index evaluates the condition of marine ecosystems according to 10 human goals, representing an ecosystem-based assessment of the ecological, social, and economic benefits that a healthy ocean provides. The higher the score (on a scale from 0 to 100), the healthier the ecosystem: in other words, the more sustainably it can deliver a range of benefits to society now and in the future.

Developed by an international team of researchers and organizations led by Ben Halpern of the University of California at Santa Barbara, the index gauges ecosystems according to each of the following goals:

- Food provision
- Artisanal fishing opportunities
- Natural products
- Carbon storage
- Coastal protection
- Coastal livelihoods & economies
- Tourism & recreation
- Sense of place
- Clean waters
- Biodiversity

An ecosystem's index score is the average of its 10 goal scores. "We need an Ocean Health Index to help provide managers, policymakers, and the public with a way to pull together all the pieces of how we benefit from oceans and what affects them," says Halpern. Currently, the lowest score generated by the index is 36 for Sierra Leone's waters; the highest score is 86 for the waters surrounding uninhabited Jarvis Island, near Hawai'i. The global score for all EEZ waters is 60.

The project website - www.oceanhealthindex.org ^[16] - walks visitors through each of the goals and how they are evaluated, and provides the index score for each of 171

coastal countries and territories. The Ocean Health Index is also described in detail in an article in Nature magazine, available at www.nature.com/nature/journal/vaop/ncurrent/full/nature11397.html ^[17].

New website offers dozens of case studies on marine EBM in practice

Launched in June 2012, the website "Marine Ecosystem-Based Management in Practice" provides a treasure trove of new research and analysis on marine EBM initiatives, including 20 in-depth case studies and 45 shorter "case snapshots" of EBM efforts from around the world.

Developed by research teams at the University of Michigan (headed by Julia Wondolleck and Steven Yaffee) and Brown University (headed by Heather Leslie), the website documents the approaches and accomplishments of each EBM project, and analyzes the challenges the projects faced. The website also draws lessons across the 65 cases for improving the practice of marine EBM. The cases are searchable by various characteristics such as governance type, ecosystem scale, primary issues, and more.

The in-depth case studies involved detailed interviews of participating individuals, agencies, and other organizations. The shorter case snapshots involved web-based reviews and document analysis. The project was funded by the David and Lucile Packard Foundation. The website is at <http://webservices.itcs.umich.edu/drupal/mebm/> ^[18].

European wind energy producers call for EU directive on marine spatial planning

To help meet Europe's needs for offshore renewable energy, the European Union should draft a marine spatial planning directive to (a) ensure a level of consistency among national planning efforts and (b) make certain there is adequate ocean space for both offshore energy generation and traditional uses. That is the conclusion of a report by the European Wind Energy Association, funded by a grant from the European Commission to recommend policies for removing obstacles to offshore renewable energy generation.

According to national projections, EU member states are set to achieve around 45 GW of offshore renewable generation capacity by 2020 (from wind, wave, and tidal sources), amounting to a ten-fold increase of today's capacity in less than a decade. The report *Delivering Offshore Electricity to the EUs* at www.ewea.org/fileadmin/ewea_documents/documents/publications/reports/Seanergy_2020.pdf ^[19].

To combat shifting baselines, report collects reminiscences of reef scientists

A new report collects the memories of the older generation of reef researchers from their dives at particular sites in the 1960s and 1970s. Inspired by a discussion on the Coral-List listserv about what coral reefs were like decades ago compared to today, the report aims to combat the phenomenon of shifting baselines in ecosystem science: i.e., the tendency for each generation to build baselines anew, thus failing to recognize slower, long-term changes.

The report *Reef Reminiscences: Ratcheting back the shifted baselines concerning what reefs used to be* is published by the Institute for Water, Environment and Health at United Nations University. It is available at www.inweh.unu.edu/Coastal/Publications.htm ^[20].

UN's Oceans Compact sets strategic vision for improved oceans management

In August, United Nations Secretary-General Ban Ki-moon announced a new initiative called the Oceans Compact, setting a general vision for the UN system to address the "precarious state" of the world's oceans. Citing the threats of overfishing, pollution, climate change, and more, the Oceans Compact calls on countries to work together to achieve better oceans management, including through ecosystem-based management and MPAs.

To help in guiding strategies, the compact proposes creation of an Oceans Advisory Group, consisting of executive heads of involved UN system organizations, policymakers, scientists, industry and NGO representatives, and others. For more information: www.un.org/Depts/los/ocean_compact/oceans_compact.htm ^[21].

EBM Toolbox: Six Field-tested Tools for Comprehensive Marine Spatial Planning and MPAs ^[22]

By Sarah Carr

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, an alliance of tool users, developers, and training providers

There are dozens of software-based tools that can be used to support comprehensive marine spatial planning projects and the planning of marine protected areas. Such tools can help stakeholders to:

- Define their social, economic, and ecological objectives;
- Develop geographically explicit plans, policies, and regulations;
- Estimate the degree to which plans, policies, and regulations will meet defined objectives; and
- Monitor performance of protected areas and zones at meeting defined objectives.

Not all tools will fit all projects, though. Some tools have been applied more widely and successfully than others over time. These field-tested, useful tools for MPAs and comprehensive marine spatial planning include, in alphabetical order:

Cumulative Impacts Model

A method for mapping the impact of human activities on marine ecosystems. Steps in the mapping process include gathering or creating maps of human activities that impact marine ecosystems, estimating the ecological consequences of these activities, creating a cumulative impact map, and ground-truthing impact scores. The resulting cumulative impact map helps users evaluate where best to site activities and focus conservation efforts.

Integrated Valuation of Ecosystem Services, or InVEST

A suite of spatially-explicit ecosystem service models. InVEST allows users to map and model ecosystem service flows and their changes under alternative management scenarios, and can be applied at multiple scales in coastal and marine regions.

MarineMap

A web-based decision-support tool that allows users to visualize the social, economic, and ecological attributes of coastal areas; spatially locate uses and activities; assess the application of uses relative to guidelines, ecological conditions and socio-economic factors; and share information and analytical results with others. Note: MarineMap is currently being replaced by second-generation tools including SeaSketch and Madrona.

Marxan with Zones

An extension of the popular Marxan conservation planning software. It allows users to allocate land and sea parcels to multiple zones, each with their own targets, planning unit costs, and biodiversity benefits. This allows users to create zoning plans that meet a variety of conservation and human-use objectives while minimizing total cost of implementation.

Multipurpose Marine Cadastre

An integrated marine information system that provides authoritative and up-to-date ocean information, including offshore boundaries, infrastructure, human use, and energy potential. It allows users to assess suitability of sites or zones for ocean uses such as wind energy facilities.

Links to case studies on each of these tools are available at <http://openchannels.org/tools/field-tested-tools> [23].

[Sarah Carr is coordinator for the EBM Tools Network. Learn more about EBM tools and the EBM Tools Network at www.ebmtools.org [24].]

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- [3] <https://meam.openchannels.org/news/meam/new-us-ocean-policy-calls-marine-spatial-planning>
- [4] <https://meam.openchannels.org/news/meam/what-role-does-ocean-zoning-play-marine-spatial-planning-viewpoints-eu-us-and-china>
- [5] <http://www.whitehouse.gov/administration/eop/oceans/marine-planning>
- [6] <https://meam.openchannels.org/news/meam/tundi%E2%80%99s-take-circling-back-hawaiian-ebm>
- [7] <https://meam.openchannels.org/news/meam/perspective-fisheries-research-needs-change-course>
- [8] <http://www.thefishsite.com/articles/contents/demfisheriesmay12.pdf>
- [9] <https://meam.openchannels.org/news/meam/perspective-coral-triangle-initiative-support-filtering-down-mpas-and-local-practitioners>
- [10] <http://www.coraltriangleinitiative.org/>
- [11] <http://ctatlas.reefbase.org/>
- [12] <http://www.uscti.org/>
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