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Creating the Necessary Management Capacity for Marine EBM

Improved marine management is something to which most coastal nations aspire, and many have made commitments to EBM. When attempts to practice EBM are unsuccessful, the assumption is often that the “capacity” to practice it is lacking. Quick translation: there is not enough money available.

But capacity to do EBM is not automatically achieved with infusions of funding: throwing more money in the management pot does not guarantee that EBM goals will be met. In this context, what kinds of capacity are most important for EBM? And how can capacity be built so that management goes beyond the sectoral, to true ecosystem-based management?

What is “capacity building”?

The term “capacity building” generally refers to efforts to nurture and apply the capabilities of people and institutions at all levels. In the specific context of capacity for marine EBM, it means having the necessary human, financial, and informational resources to do management at ecosystem scales. This involves all aspects of planning and management: stakeholder involvement, monitoring, enforcement, evaluation, and more, including adaptive adjustments over time.

The ability to manage also requires an enabling context. That is, there must be good governance at all levels, and adequate time to plan and manage effectively. Agencies can be said to have true capacity for EBM when they (a) recognize the importance of EBM and (b) utilize the management tools that are most appropriate for their environmental, socio-economic, and political situations. Several commonly used capacity-building tools are listed in the box on page 3.

A new (U.S.) National Research Council report, *Increasing Capacity for Stewardship of Oceans and Coasts: A Priority for the 21st Century*, recommends ways to strengthen marine protection and management capacity. It was authored by an international committee of experts and is available online at www.nap.edu/catalog.php?record_id=12043. (Although the report costs US \$35.10 in hardcopy, the website allows readers to view it online for free, page-by-page.)

The NRC report walks readers through all processes of capacity building — conducting periodic assessments, planning for long-term funding, developing leadership and political will, and more — and offers a series of recommendations for ensuring that EBM is adaptable and sustainable. Much of this MEAM article on capacity building reflects lessons from the NRC report, supported by additional examples.

Common barriers

Common barriers exist to building adequate capacity. Institutions can be myopic and focused on protecting their turf, and sometimes do not work in harmony with other institutions. This fragmentation of management can lead to significant gaps in management coverage, and sometimes redundancy. It can also cause a lack of regionally agreed-upon priorities for steering capacity-building funds to effective EBM.

Overcoming these common systemic problems is essential for the range of institutions responsible for supporting EBM. These include not only conventional resource-management institutions (such as coastal management agencies or international scientific monitoring programs) but also institutions at the local level. Each of them needs to articulate capacity-building goals and plans for achieving them, including honest appraisals of institutional strengths and weaknesses. Institutions also need to develop ways to retain the capacity they have acquired, and create incentives for continued learning.

The need to build and retain EBM capacity is shared by developed and developing nations. A recent survey by the Coastal Services Center of the (U.S.) National Oceanic and Atmospheric Administration polled more than 250 coastal managers in the U.S. on their knowledge and application of EBM. Among the findings:

- 44% of coastal managers said they had less than “a working knowledge” of EBM;
- 88% said their organizations needed professional development training in EBM;
- 60% said a lack of resources affected their organizations’ implementation of EBM.

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The Coastal Services Center is now using the survey to guide its development of an EBM training course. (For full results of the survey, which covered a wide range of EBM questions, download *Summary Report for the Coastal Ecosystem-Based Management Course Needs Assessment* at http://csc.noaa.gov/bins/products/CEBM_Needs_Assessment_final.pdf.)

Making strategic investments

Given limited resources available to create adequate capacity for EBM — as well as increasing pressures on marine environments — investments in building capacity need to be strategic. This means relying on the best science: both on the nature of threats to marine resources, and on the socio-economic impacts of potential solutions.

The NRC report finds that in some cases, the donor community has not been strategic enough in its investments. Donors (both government and private) regularly focus on ecological conditions while spending little time assessing the existing capacity for coastal and ocean management. And when they do the latter, they rarely share their results with other donor institutions or with the host country. The report suggests that a standardized set of criteria for performing such capacity assessments would help ensure that adequate capacity exists to carry out funded programs. Unfortunately, no such set of standards exists.

Failures in governance impede the growth of capacity. Stephen B. Olsen, a co-author of the NRC report, tells MEAM that *governance* is not analogous to *government*. "There is no single mode of governance that fits all societies and all circumstances," says Olsen, who has advised coastal zone management projects in Ecuador, Sri Lanka, and Thailand, among other nations. "Governance is a composite of the influence that government, civil society, and markets all exert on individuals and societies. Increasingly it is markets — particularly international markets — that are the drivers of change. In some settings the role of government as both a driver and a responder to ecosystem change is modest or even insignificant. As ecosystem change accelerates, government, NGOs, and markets all have important roles to play in the practices of stewardship."

To create the conditions for true EBM, the governance situation must account for the roles, responsibilities, and strengths of various institutions, and the larger societal context in which these institutions are embedded. To improve governance, key leverage points must be identified, including investing in leadership development in the realms of government, civil society, and the private sector.

Financing EBM capacity building

The greatest impediment to creating capacity for EBM, according to the NRC report, is lack of sufficient long-

term funding. But infusions of funds, as stated earlier, often do not lead to true EBM. This is partly due to the lack of attention given to long-term sustainable financing of projects. Donors and practitioners should each determine how capacity can continue to grow, or be effectively used, once donor investments have been made. Development of sustainable financing mechanisms — such as user fees; fines; licensing and certification; biodiversity offsets; mitigation banking; debt-for-nature swaps; and compensation mechanisms for environmental/social impacts caused by ocean industries — needs to be endorsed as a priority.

Another barrier to building capacity can crop up when the allocation of donor money is based neither on need nor on objective appraisals of whether the funding can be absorbed. Donors often attempt to minimize their risk by pursuing "low-hanging fruit" — problems that are easily resolved — rather than responding to the greatest management challenges. And there is a tendency to invest in tangible capital assets (vehicles, buildings, state-of-the-art technology), rather than investing in less tangible things like operating expenses and development of social capital. This means that EBM practitioners can be flooded with things that they do not need or cannot maintain — such as boats or equipment that are difficult and/or costly to maintain.

Additionally, infusions of large sums of money into projects in developing countries, especially small community-based projects, can often be counterproductive. As one example, an EBM project on Tanzania's Mafia Island faced the prospect of receiving large sums of donor funds that could not be absorbed by local institutions. This created such conflict that plans were developed to decrease the stream of donor support to levels that could be absorbed and utilized.

In the U.S., the coastal state of Rhode Island is one of many that face the challenge of securing adequate financial capacity for coastal management. In 2004, the state created an interagency commission — the Bays, Rivers, and Watersheds Coordination Team (BRWCT) — to apply EBM principles to the management, protection, and restoration of Rhode Island's fresh and marine waters and watersheds (www.coordinationteam.ri.gov). Now, amid a national economic recession and state-level budget cutbacks, the team is due to issue a plan this year to provide the basis for agency-based annual budgeting and programming.

Ames Colt, chair of the BRWCT, says, "We are seeking to launch the plan in a time of extreme fiscal duress in Rhode Island government. It is quite possible that agency budget cuts, some severe, will compel deeper strategic thinking and reorganization around EBM principles." A shortage of funds, he suggests, could focus the management spotlight on what is most needed to achieve EBM, and willow out programs that were superfluous to reaching that goal.

Public education

Capacity building occurs in the context of societal constraints to ocean and coastal stewardship, such as inadequate public education and environmental literacy, generally low awareness of ocean issues, and inhibited access to information.

These challenges, specifically regarding how oceans and coasts contribute to human well-being, pose a major obstacle to implementing EBM at large scales. Where there is little public knowledge of the importance of well-managed resources, there is often little political will to make the necessary changes. Facilitating the transfer of information is important to overcoming the ignorance barrier. Thought must be given to packaging current knowledge for current and future generations. In other words, information flows need to go beyond the specialized language of experts and out to the people — cascading down the steps of generations.

In the Bahamas, a conservation initiative by The Nature Conservancy and the Bahamas National Trust has centered on the island of Andros. Using the occasion of a large-scale ecological assessment, the project has aimed in part to build local capacity by training Androsian students in marine science and management. (Background on the project is at www.nature.org/wherewework/caribbean/bahamas/press/press2137.html.)

Student participants not only developed skill sets, but contributed to capacity for outreach across generations. “Although we are growing as a country, Andros is definitely one of those parts that should be saved and conserved — a vital part of our beautiful Bahamas land,” said Ketroya Oliver, an Androsian college student.

Leadership

Local leaders and “champions” for the oceans need to be identified and nurtured. Support is also needed to catalyze scientific leadership, building on existing capabilities to enhance key areas of applied research. Creating centers of excellence and linking these centers in regional networks can help create a foundation of science for decision-making and spur leadership.

The approach to EBM of the Coral Reef Alliance (CORAL), an NGO with projects throughout Oceania and the Caribbean, focuses on developing capacity by encouraging ocean leadership at the community level. This is done by focusing resources on activities that leverage existing groups, local community interest, and private sector involvement around projects that increase MPA effectiveness. “We have found that perhaps the single-most important aspect for effective EBM capacity building has been in finding the right local people,” says Rick MacPherson, director of conservation programs at CORAL. “These people are able to broker the collaborative alliances between stakeholders — many of whom may not necessarily communicate with, let alone trust, one another. The challenge, of course, is finding the people who can play this delicate role early in a project. Our experience is that it is a formula partly based on knowing what to look for, as well as a dose of good fortune.”

CORAL’s project in the Namena Marine Reserve in Fiji demonstrates this. The Namena Marine Reserve is a remote, locally managed marine area where resident communities had previously established some degree of resource management. CORAL’s early work in Fiji involved recruiting a local field staffer who could bridge the concerns of two sectors: the local communities

“We have found that perhaps the single-most important aspect for effective EBM capacity building has been in finding the right local people.”

- Rick MacPherson, CORAL

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Commonly used capacity building tools for EBM

Management training programs

Example: Coastal Resources Center summer program in integrated coastal zone management — www.crc.uri.edu

Marine management degree programs

International Ocean Institute Advanced Degree Programs, in Malta — www.ioinst.org

Centers of excellence

Coral Reef Targeted Research Centers of Excellence www.gefcoral.org

Outreach and media training

Aldo Leopold Institute — leopoldleadership.org

Institutional evaluation and restructuring

Packard Foundation Organizational Effectiveness Program — www.packard.org

Scientific mentoring

Andros Rapid Assessment Project, undertaken by The Nature Conservancy — www.nature.org

Innovative financing assistance

GEF-assisted Marine Legacy Fund of Tanzania — see MEAM 1:2

Management networks

Partnerships for Environmental Management in Seas of East Asia (PEMSEA) — pemsea.org

Leadership recognition programs

Pew Fellows in Marine Conservation Program — www.pewoceanscience.org

Cosmos Prize — www.expo-cosmos.or.jp

responsible for Namena's reef management, and the tourism sector, which desired greater administrative transparency of the managed area.

MacPherson underscores the notion that leadership is a key element of capacity. "Ideal candidates for field staff are individuals already in some conservation role within the local community, or individuals whose connections to the marine recreation sector lend them unique credibility and access," he says. "CORAL was successful in sharing a percentage of staff time with one of our project partners to hire a local Fijian to serve this capacity-building role. An added bonus was that this young man was born and raised in one of our project villages, could advise on all aspects of Melanesian culture, and knew first-hand the challenges that the local community faced in managing their reefs. As a former divemaster for one of the resorts, he also had immediate credibility with tourism operators."

Importance of regional frameworks

EBM is more than an additive process of gathering local-level ocean and coastal management projects together until the scale of focus extends to whole ecosystems. It requires integration of management across sector-focused agencies, and often across the jurisdictions of coastal nations. The regional focus is paramount.

Sometimes the key to creating adequate EBM capacity is developing an underlying regional governance framework. Arrangements such as the Commission for the Conservation of Antarctic Marine Living Resources, or CCAMLR (www.ccamlr.org) — an intergovernmental body that manages the resources of the Southern Ocean — can lay the groundwork for EBM successes. In 2007, for example, the 25 member nations of CCAMLR unanimously adopted a binding conservation measure to protect vulnerable seafloor ecosystems from destructive bottom fishing activities. Seamounts, hydrothermal vents, cold-water corals, and sponge fields around Antarctica will now be protected from the adverse impacts of bottom fishing. The measure is a significant step in protecting the Antarctic marine environment.

At the other pole, attempts to manage Arctic ecosystems have been relatively piecemeal so far, although that may be changing. The Arctic Council, an intergovernmental forum for Arctic governments and peoples (www.arctic-council.org), is embarking on several projects to look holistically at the Arctic ecosystem. One project will be an examination of Ecosystem-Based Ocean Management in the Arctic (EBOMA) to look at existing practices among the Council's eight member states. The Circumpolar Biodiversity Monitoring Program and other initiatives will monitor changes in the Arctic ecosystem on land and at sea, and will be part of the Arctic Observing Network, a project of the International Polar Year. Additionally, the Arctic fishery management plan being developed by the North Pacific Fishery Management Council

proposes to restrict fisheries in newly ice-free areas until a scientific basis for management exists.

Of course, society and geography at the poles are vastly different. While the Arctic is an ocean surrounded by sovereign countries — the northern regions of which have long been inhabited by indigenous peoples — Antarctica remains uninhabited by humans, save a small number of visiting scientists.

Mark Mallory of the Canadian Wildlife Service notes the Arctic's convolution of aboriginal interests, shared resources among countries, unclear jurisdiction on boundaries or rights of way, and internal overlap of bureaucracies. "In Canada, a big challenge is that local communities have considerable input and control over issues in their area, and their views may not be the same as those of different regulatory and management organizations," says Mallory. "Add to that the differing international views, and I think that reaching a pan-Arctic treaty [similar to CCAMLR] would be tough — and implementing it even tougher."

Will the capacity to practice EBM in a strategically important region like the Arctic ever be developed, through partnerships between governments and the indigenous people for whom the ecosystem is their sole life-support system? If so, it will require strong commitments and multilateral cooperation among the Arctic nations. ■

For more information

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Summary

Creating lasting capacity for EBM is necessary to resolve issues of ocean sustainability, and should be recognized as a vital investment of time and resources. Capacity needs to be strengthened not only in developing countries, but in developed ones as well. There is no single formula for creating adequate capacity, but the following elements are often features of it:

- 1) Implementing a long-term and sustainable funding plan, with a wide variety of sources making coordinated investments;
- 2) Relying on the best available scientific information across disciplines and, where that information may be lacking, investing in scientific and management training;
- 3) Communicating scientific information so that it is understood and accessible to the public;
- 4) Making strategic decisions based on assessments to pinpoint obstacles to EBM;
- 5) Catalyzing the creation of (or building on existing) regional frameworks for governance, cooperation, information exchange, and/or sharing of management duties; and
- 6) Investing in individuals and institutions to develop leadership.

Case Study: Creating Adequate EBM Capacity — The Great Bear Rainforest

The Great Bear Rainforest on Canada's west coast demonstrates how capacity to do large-scale, integrated management can be created and sustained. It is not a marine EBM project in the traditional sense: its focus is on the rainforest, not the adjacent coastal waters. But the initiative has much to offer the marine community in terms of lessons learned. Although full implementation remains to be carried out, these elements of necessary capacity for EBM are in place:

- Sustainable financing;
- Leadership;
- A good scientific base of information;
- High awareness and participation by stakeholders;
- A strategic plan based on assessments of governance, as well as ecology, of the region; and
- Political will generated by strong partnerships among governments, civil society, and the marketplace.

History of Great Bear

The Great Bear Rainforest and the islands of the Haida Gwaii are part of the largest coastal temperate rainforest complex on Earth. Its 21 million acres (85000 km²) represent a quarter of all existing coastal temperate rainforest worldwide. The project area itself extends more than 250 miles (402 km), from the northern end of Vancouver Island, across Queen Charlotte Strait, and along the coast of the province of British Columbia to the Alaskan border. To view a map, go to <http://depts.washington.edu/meam/greatbear.jpg>.

Civil society has had an important role to play in the transformation of management of these forests from single-sector (timber management) to true EBM. In 1995, two NGOs that had long focused on the region's forests — Round River and Raincoast Conservation Society — joined forces with several national and international NGOs to initiate the Great Bear Rainforest campaign (www.savethegreatbear.org), with support from the David Suzuki Foundation. The other NGOs included Greenpeace, Forest Action Network, Rainforest Action Network, the provincial chapter of the Sierra Club of Canada, and Natural Resources Defense Council. Over the course of the ensuing decade, these groups called for improved management of the forests and also conducted research, helping to build scientific capacity to support eventual EBM.

In February 2006, the British Columbia provincial government announced that over 4.5 million acres (18000 km²) of the Great Bear Rainforest would be placed in protected areas and another 19 million acres (77000 km²) under strict EBM land-management guidelines. To manage this region, a landmark agreement was reached a year later, featuring an unprecedented consensus among

the timber industry, NGOs, First Nations indigenous groups, federal and provincial governments, and local communities. In an innovative public-private partnership, NGOs matched governmental commitment to ensure adequate capacity to manage the rainforest ecosystems sustainably. The Canadian federal government committed CDN \$30 million, as did the provincial government of British Columbia. In turn, The Nature Conservancy — acting as a conduit for private sector investment — and a core group of U.S. and Canadian foundations committed an additional CDN \$60 million. Together, this total of CDN \$120 million would support the forests' management, with the dual goals of economic and ecological sustainability.

“The challenges of our age require innovative approaches that place a premium on a healthy environment,” said Mer-ran Smith, BC Coast program director for ForestEthics, an NGO. “We are proving that conservation can attract investment and actually support jobs that won't threaten the living systems that we depend upon.” First Nations, provincial, and federal governments continue to meet in special Land and Resource Forums to decide on the policy and legislative framework for EBM, as well as on detailed land-use and resource management plans to put EBM into practice throughout the region.

Some parties remain skeptical about the outcome, saying that although the agreements have been lauded and financial commitments made, little has happened on the ground so far. The litmus test for true EBM will be when the EBM framework and the regional land/resource plans, to which all parties have agreed, are given legislative approval and implemented.

Conclusions

It is too early to tell if this ambitious EBM plan will result in conservation success and the safeguarding of the livelihoods and cultures of residents of the region. But if the project fails, it will certainly be difficult to peg the failure to a lack of capacity.

The main lesson from this large-scale initiative is that transformations of management from fragmented and sectoral to integrated and ecosystem-based are possible without the formation of new institutions. While the tendency in environmental management is to build capacity by investing funds in the creation of new institutions, the capacity may be more effectively grown by creating strong linkages, backed up by negotiated agreements, between existing institutions. Partnerships that span all aspects of governance — from civil society to governments to the business community — take the pressure off single agencies to create sufficient overall capacity for EBM. In the marine environment, where building capacity for EBM may be even more of a challenge, these innovative partnerships may have great potential to further EBM goals. ■

Transformations of management from fragmented and sectoral to integrated and ecosystem-based are possible without the formation of new institutions

EBM Perspective: Scaling Up Grassroots Capacity for EBM in the Philippines

Editor's note

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By Fernando Tiburcio and Paul Watts

In the Philippines, EBM stems from a grassroots approach supported by national economic conditions and responsive multilevel leadership. Given ongoing implementation of marine management, it may be that local-level institutions are in the best position to build capacity for EBM in this country.

Philippines culture and leadership

The archipelagic nation of the Philippines has a coastline that is more than 6,000 km longer than that of Africa's. Its population is rapidly surpassing 90 million and lives on just 300,000 km² of land. Dependence on marine fish for protein is without clear alternative, and fishing increasingly puts pressure on the Philippines' globally recognized biodiversity. Yet as a lesser-developed country, the Philippines has minimal government resources for EBM.

The Philippine Local Government Code of 1991 transferred responsibility and authority for nearshore manage-

ment from the central government to 850 Municipal Local Government Units (MLGUs) that exist in the country's nearly 50 Provinces. These MLGUs are responsible for some 22000 coastal *barangays* – the country's smallest political unit.

Philippine NGOs and academic institutions provide ongoing facilitation in light of this decentralization: organizing fisherfolk, establishing MPAs, and providing supplemental livelihood assistance. These interventions have led to the formation of fisherfolk federations and alliances that actively supplement government in formulating and implementing coastal laws and management. Consolidation outward from the local fisherfolk communities acts to engage a broad range of society and builds both consensus and capacity for EBM.

One leadership initiative, *PAMANA Ka Sa Pilipinas* (PAMANA), involves a national alliance of community-based MPA managers. Begun in 1999 with support from the Haribon Foundation, PAMANA has over 120 community members. It is now engaged with larger ecosystem initiatives involving fisherfolk organizations and *barangay* councils, moving from its initial focus on MPAs to larger bay-wide coordination.

EBM in the Philippines is best developed through engagement of stakeholders to achieve consensus on common perspectives and environmental mandates. Fisherfolk challenges are a priority. The Philippine Senate Environment Chair, Loren Legarda, said recently that there is a "policy imperative to provide the necessary measures to enhance the restorative capacity of our ecosystems; to nurture nature, to bring our soil, seas, forests and mountains back to health and vibrancy." Senator Legarda also highlighted the need to focus support on fisherfolk leaders, particularly given that fish wardens sometimes sacrifice their lives in the dangerous job of enforcing fishing restrictions.

In one example of capacity-building through academia, Aurora State College of Technology (ASCOT) in Aurora Province engaged PAMANA in an initiative to scale up from local *barangays*, establishing a North

Philippine Sea EBM approach in one of the Philippines' six marine bioregions. In the past decade ASCOT, in partnership with Volunteer Services Overseas (an international development charity), also initiated a province-wide coastal resources management program. The program links MPAs and fisherfolk interests in a network with assistance from USAID, the University of the Philippines Marine Science Institute, and the Philippine Ecogovernance Program.

Aurora Province has taken a leadership role on related population growth issues, initiating the first provincial reproductive health care ordinance in the country. Through adult education on sustainable development, ASCOT is aiming to influence family planning, fisheries resource partitioning, and ecosystem management. A proposed EBM diploma/degree curriculum was developed to complement existing national fisheries programs and institutionalize fisherfolk consolidation outward from the local communities. The curriculum engages society and builds consensus and capacity at the marine bioregion level. Similarly, PAMANA's expansion of enhanced and sustainable EBM linkages and chapters furthers EBM.

Conclusion

Many synergistic activities have emerged from the engagement of civil society and academia in EBM: participatory monitoring, cooperative patrols, advocacy, lobbying and co-management. Such activities allow leaders to learn from each other's skills and experiences. Having unified and coordinated activities among fisherfolk is the best approach to EBM in the Philippines because it builds on the strength of local organizations.

Developing Philippine EBM capacity involves leadership, integrated outreach education, and active scaling up from the grassroots to the national and international level. Focusing facilitation and scientific research on grassroots beneficiaries ensures cultural linkages remain intact and creates optimal capacity for sustainability. PAMANA builds capacity for EBM, not to protect a place, but rather to protect culture and livelihoods, and the environment upon which both depend.

Many feel a primary challenge for building Philippine EBM capacity is the sustained operation of the PAMANA Secretariat, particularly to implement communication strategies. PAMANA links local views nationally, at the same time disseminating strategies to implement national EBM policies. This avoids an exclusively top-down approach. Within PAMANA, MPAs and EBM are not mere buzzwords, but rather the basis for stewardship for future generations, because "*ang dagat ay buhay natin*" ...the sea is our life. 

Challenges in Capacity Building in Caribbean Small Island Developing States

By Lorna Innis

For many Caribbean small island developing states, marine EBM is an ideal, whereby the paths to success are defined and understood but the journey is often slow and arduous. Indeed as managers, technical officers, and government agencies begin to understand the ever-increasing range of disciplines required to achieve EBM in the long term, many countries incrementally reduce their expectations in order to match the skill sets and time available. Thus marine management is driven by what is realistically achievable rather than the maximum possible — EBM itself.

In the past, a mature EBM system might have aimed solely for maintenance of ecosystem integrity. But the current paradigm requires the enhancement of human well-being as well. Thus even more capacity development is required under the comprehensive new objectives that EBM comprises today. Capacity needs to be built correspondingly in areas such as resource economics and other social sciences.

The Caribbean Region

In the Caribbean region, EBM presents an even greater challenge to already-stressed human resource capability of small island developing states.

The member states bounding the Caribbean Sea represent dramatically different political, social, and cultural systems, further separated by a range of technical and technological capacities. Contrast the United States, or Mexico, and their approach to marine management, with the management capacity of an Antillean small island. The difference has not only to do with availability of funding for management, but also differences in availability of information, access to technology, strength of institutions, experience of personnel, existence of leadership, and political will.

Throughout the Caribbean Basin, the institutional arrangements for EBM vary from a well-funded and functioning Coastal Zone Management Unit and/or Fisheries Ministry in some countries, to an absence of any institutional support for EBM in others. The Caribbean Sea as a shared marine space, with shared living marine resources, would benefit greatly from a collaborative effort on the part of all bordering countries to achieve EBM. (The Caribbean Large Marine Ecosystem Project, funded by the Global Environmental Facility, is an attempt to achieve this — see <http://cavehill.uwi.edu/cermes/clme.html>.)

Incremental capacity development: Barbados

An ideal case for incremental capacity development in the Caribbean Region is Barbados, where coastal erosion had emerged as an important issue. In response, the

Government of Barbados first commissioned a baseline study to examine the capacity for protecting the country's beach resources. As understanding grew of the links between beach condition and coastal water quality or coral reef degradation, policy makers adopted an ecosystem-based approach to coastal zone management, with capacity development at its core. The Government identified human competency requirements, and laid out plans for institutions, legislation and policy. Steps included developing integrated coastal management institutions with clear lines of communication, staffed by individuals who had gone through good training programs. As a result, the country has succeeded in creating good capacity for coastal EBM.

However, even Barbados has its challenges. As in other countries, limited human and financial resources prevent Barbados from conducting adequate long-term planning to ensure sustained progress toward EBM. In addition, when small island governments invest in training officers in the different EBM disciplines, these individuals often migrate to jobs in regional or international organizations, as their former pay levels become less attractive once training is completed. This causes a leak of human capacity for continuing EBM efforts in their home countries. Retaining trained and committed individuals is not a problem unique to the Caribbean, of course, but it is acutely felt in the region.

An additional challenge: a plethora of international projects aimed at building capacity in small island developing states has produced well-trained technical officers, but these officers often have little or no actual authority to change policy or influence governance at their national levels. This political environment, coupled with lack of technology and instrumentation to conduct meaningful work, contributes to the leakage of capacity in the Caribbean small islands.

Conclusions

Leaders must be persuaded that effective EBM reduces a country's vulnerability to many pressures and hazards. By building ecosystem resilience, EBM enables:

- Consistent food production;
- Improvement of the tourism product;
- Protection against natural hazards;
- Greater resistance to negative effects of changing climate; and
- A solid basis for incremental improvement in the overall economy.

The nations of the Caribbean Region would benefit from a cooperative approach to developing marine EBM throughout the region, but local capacity needs to be increased as well. This requires continued international development assistance, but with incentives to encourage trained individuals to remain in the region and advance their own countries toward EBM goals. Capacity should be grown organically and incrementally, not built suddenly and left to rest on socio-politically shaky foundations. At the same time, political will needs to be strengthened, and leadership created, based on the realization that ecosystem health and economic health are vitally linked. ■

Editor's note

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Note from the editor

Dear MEAM Reader,

This is my second issue as editor of *Marine Ecosystems and Management*. I view the newsletter with great excitement, particularly the opportunity it offers to help bridge chasms between disciplines, as EBM requires. This includes linking the sometimes-isolationist marine community with the broader world of environmental management. Terrestrial managers have much to teach, and much to learn from, marine ecosystem-based managers.

My three decades of work at the nexus of the marine science and policy fields have taken me through Africa, Asia, the Caribbean, the Mediterranean, the Pacific, and the Americas. I have seen first-hand many of the struggles of putting EBM into practice. The purpose of MEAM is to help the EBM community address those challenges together. If you have ideas for articles or suggestions for improvements, please let me know. I look forward to hearing from you, and to growing and strengthening the field of EBM.

Tundi Agardy, Ph.D. editor@meam.net

Notes & News

Next issue: watershed management and linkages to estuaries

In our next issue, MEAM will look at marine EBM from the perspective of river basin commissions and watershed management. Do you have examples of freshwater EBM successes or failures, or thoughts on how lessons learned from such projects might apply to the marine environment? If so, please tell us at editor@meam.net. Thank you.

Major new book published on integrated coastal zone management

A new reference book on integrated coastal zone management (ICZM) provides what is likely the most comprehensive analysis of the field to date. Edited by an international team of ICZM experts, the 800-page *Integrated Coastal Zone Management — The Global Challenge* features case studies from around the world: Asia, Africa, the Americas, Europe, the Middle East, island nations, and more. The book highlights coastal EBM, and looks at the changing global scenario of ICZM through several interrelated themes, including the scaling of ICZM.

The book costs US \$226 and is published by Research Publishing Services, based in Singapore and India. To learn more about the book and to review the table of contents online, go to www.researchpubonline.com/books/iczm.html

Proceedings from workshop on large marine ecosystems

A new report offers proceedings from a 2007 workshop in Cape Town, South Africa, on the economic valuation of large marine ecosystems (LMEs). Sponsored by IUCN, the workshop gave an overview of economic valuation as a tool in LME management, and profiled several cases of LME valuations worldwide, including for the Benguela Current, Caspian Sea, and Yellow Sea. The 18-page report *Economic Valuation of Large Marine Ecosystems* is available at www.iucn.org/THEMES/MARINE/pdf/ev_workshop_report.pdf

Correction

In our previous issue (MEAM 1:2), there was an error in our identification of Michael Sissenwine, who authored the essay “Globalization and Scaling in Ecosystem-Based Management”. He is a visiting scholar at the Woods Hole Oceanographic Institution in the U.S. and a marine science consultant. He formerly served as director of scientific programs and chief science advisor for the U.S. National Marine Fisheries Service.

The EBM Toolbox

By Sarah Carr

Integrating diverse tools, and why there is no EBM “SuperTool” yet

Editor’s note: The goal of The EBM Toolbox is to promote awareness of software tools for facilitating EBM processes, and to provide advice on using those tools effectively. It is brought to you by the EBM Tools Network (www.ebmtools.org), a voluntary alliance of leading tool users, developers, and training providers to promote awareness, development, and effective use of technology tools for EBM in coastal, marine, and watershed environments.

Ecosystem-based management involves integrating information from diverse fields (such as ecology and economics), sectors (conservation, industry), and sources (scientific studies, traditional knowledge). It can also involve integrating diverse software tools, such as land use planning tools, ecosystem models, and conservation site prioritization tools. Linking such tools — i.e., making them “interoperable” — can provide EBM practitioners with a structured and scientific means of bringing communities together and facilitating communication.

Would it be better if we just had one tool, an EBM “SuperTool”, that could be applied to every EBM project — rather than having to piece together a different set of tools for each project? Not necessarily. EBM projects are very different from each other, so a single SuperTool would have trouble addressing the needs of most EBM projects without being prohibitively complex and data-hungry. In addition, interoperating tools from diverse sectors allows specialists to keep individual tools up-to-date with the latest developments in their respective fields, thereby bringing that new knowledge into EBM.

That said, it is undoubtedly desirable for the EBM field to have a suite of user-friendly tools to address the greatest demands for integration. Current projects on tool interoperability are an important step toward this goal. To learn more about interoperability projects being conducted by some EBM Tools Network members, check out “Advancing Ecosystem-Based Management: A Decision Support Toolkit for Marine Managers” at www.marineebm.org.

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