

In an Era of Climate Change, How Can Managers Ensure That Today's MPAs Remain Relevant Over Time?

The oceans offer increasing evidence that global climate change is underway. Sea surface temperature is rising, while polar sea-ice is retreating. Coral reefs are suffering from severe bleaching events. Amid these and other phenomena — as well as the growing number of disturbing scientific forecasts on the effects of climate change on marine systems — MPA practitioners may feel somewhat helpless. Already faced with the day-to-day challenges of MPA management, many practitioners are simply not addressing the long-term issue of climate change in a focused, meaningful way.

The ultimate answer to the climate-change challenge is, of course, beyond MPA managers' control: that is, a global commitment to reductions in greenhouse gas emissions. But even if drastic reductions were made right now, it is still likely that climate change would continue through this century before finally reversing course, according to forecasters. For MPA managers to ignore the problem in the meantime will not make it disappear.

Three challenges for MPA managers

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Climate change is a serious and imminent threat to marine ecosystems. The ability of MPA management to adapt to climate change will be critical to the future of these systems, including the social and economic services that they provide.

There are at least three key challenges that need to be met if MPAs are to be still relevant half a century from now.

First, climate change acts cumulatively and synergistically to increase risk of damage and decrease recovery potential, making it even more difficult for MPAs to achieve their current goals. This risk will increase with the rate and extent of climate change. MPA management must accommodate this new reality by actively supporting climate change mitigation efforts through awareness raising and advocacy. Managers also will need to increase the effectiveness of efforts to manage activities and stresses that could exacerbate the impacts of climate change, such as water quality, fishing, and

By taking a proactive approach to the challenge of climate change, MPA practitioners can best ensure that their sites may withstand change over time. This month, *MPA News* posed a question to several experts:

"In the coming decades, global climate change could have significant impacts on the oceans: sea surface warming, coral bleaching, sea level rise, acidification, pole-ward shifting of habitats, and the possibility of species extinctions. The oceans could look quite different in 50 or 100 years. With this in mind, what can MPA planners and managers do to help ensure that today's MPAs — which are necessary for protecting today's biodiversity — are still relevant half a century from now?"

Their responses, below, are in their words. Additional responses — from Rod Salm, Jerker Tamelander, Kristina Gjerde, and Graeme Kelleher — are available on the *MPA News* website at <http://depts.washington.edu/mpanews/climate.htm>.

habitat damage. These efforts must extend beyond MPA boundaries.

Second, climate change will result in further degradation to marine ecosystems in the course of this century, making sites that are naturally resistant to climate-related stresses increasingly valuable to ecosystem resilience. These refugia, especially if they have the potential to be sources of propagules for recovery of damaged areas, will warrant especially effective management to protect them from other threats.

Third, MPA management needs to be adapted to explicitly accommodate the inherent, and increasingly variable, dynamic of marine ecosystems. Climate change alters the disturbance regime for natural systems, increasing the imperative for management goals to focus on process (e.g., recruitment success, algal removal rates) in addition to state (e.g., coral abundance, density of fish).

Climate change is resulting in unprecedented pressures on marine ecosystems and their management. It also has the potential to make MPAs more relevant than ever, if MPA managers can adapt to the challenge of climate change.

Dear reader:

This issue of *MPA News* covers the months of December 2006 and January 2007, allowing our staff a year-end holiday. In February, our regular monthly delivery will resume.

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MPAs as observatories of change

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We are asked to think globally and act locally. But when it comes to climate change, there is not much that MPA practitioners might feel they can do to address the problem from within the boundaries (often very limited) of the areas of their remit. However, considering that climate change is caused by human actions, and that human actions are affected by policy, MPAs are privileged observatories from where natural phenomena related to change can be observed, studied, and communicated to policymakers, to the media, and to the wider public. Protected areas can thus act as tools to drive policy change, and can contribute to slowing down and eventually reversing the problem at its origin. Monitoring is an integral part of management, and in the vast oceans' expanses it is within MPAs that regular monitoring is most likely to take place.

Years ago, oblivious to the raging human controversy on whether climate was changing or not, thermophilic fishes in the Mediterranean had already started their northward expansion, which was first spotted from within MPAs. A large international protected area for cetaceans established in the NW Mediterranean, known as the Pelagos Sanctuary, was built around a permanent front that supports large amounts of northern krill. Should climate change significantly affect krill numbers, this will in turn cause population changes in the cetaceans that occur there to feed. Having a specially protected area for cetaceans on-site is the best guarantee that someone will notice and blow the whistle.

Species translocation, dynamic reserves

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In a world in which climate is rapidly changing, and where species distributions are likely to change as well, there is more need than ever for a truly global network of reserves to make these movements possible. A global network of reserves would need to be based on connectivity at both the level of adults and propagules. Where species are unable to cope with change rapidly enough, they may need to be translocated. This poses huge scientific and ethical questions (i.e., Will we just make things worse?). The science needed to underpin this network is highly challenging and will need to be undertaken at a massive scale to better understand movement patterns of organisms in natural and unnatural conditions, as well as the ways in which currents affect their dispersal. Reserve networks need to be set up in such a way that they can best act as appropriate stepping stones. Decisions on their location may also be informed by downscaled global climate models that will help predict local responses of the ocean in terms of

temperature, currents, wind, upwellings, and coastal factors such as waves and terrestrial runoff.

Dynamic reserves, shifting with climate at an appropriate rate, may need to be part of the solution. As sea level rises, the shape of the coastline will change, creating new habitats, and impact on current environmental quality in both negative and positive ways. We must know how these processes will affect reserves. With rising sea levels there will be a massive panic to armor coastlines and preserve real estate. Reserves can also provide a mechanism to try and preserve our natural coastlines. This may require a re-thinking of the land/sea interface in terms of what we mean by a marine reserve.

Integrating marine and coastal protected areas

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I do not believe we can be proactive enough to think about futuristic plans that involve anticipating a climate-changed environment and siting MPAs in areas that may be important to protect in the future. This is partly because our predictive capability is quite small; partly because our understanding of resilience is still quite limited; and partly because I cannot imagine generating the necessary political will to protect anything but those areas screaming for protection today.

However, I do think the realities of climate change and its potential to significantly change marine ecosystems really underscore the need for MPA planners to do a much better job of thinking about the land/sea interface, and working with land-use planners to design MPA networks that fully span marine, riverine, and coastal land areas in highly strategic ways. Design of such integrated networks would allow greater flexibility for adaptive management as sea levels rise. It would also allow coastal managers to better address heretofore underemphasized issues of land-based sources of pollution and the conservation of estuarine nursery areas and other significant habitats throughout watersheds.

In addition, the prospect of severe climate change behooves us to do a much better job of managing the MPAs we already have. There is little question that healthier ecosystems are better able to withstand the stresses caused by warming, rapid sea-level rise, changes in precipitation patterns and pollutant loading, and altered chemical composition.

Managing for ecological resilience

Lizzie Mcleod, co-author (with Rod Salm), *Managing Mangroves for Resilience to Climate Change* (<http://www.iucn.org/dbtw-wpd/edocs/2006-041.pdf>), USA. E-mail: emcleod@trc.org

MPA planners can take direct actions to address climate change threats, specifically coral bleaching. At The Nature Conservancy, our core strategy to address

climate change in tropical seas is to design networks of marine protected areas that are resilient to change. Key approaches include mitigating human impacts on reefs (e.g., pollution, sedimentation, destructive fishing) because healthy reefs are better able to respond to climate stress. Further, controlling land-based sedimentation and other sources of pollution are important mechanisms to help maintain water quality and reef health. MPA planners need to link with land-use planners and ICM programs to address land-based impacts.

MPA planners and managers can incorporate representative samples of the full range of habitat types into MPA design. These habitat types can be replicated to spread the risk of losing any one type from a disturbance. Managers can monitor herbivores that control macroalgae and manage fisheries to maintain optimal conditions for coral settlement on reefs where algae can outcompete the coral larvae for settlement space. Managers can also identify and fully protect coral communities that are resilient to climate change impacts. Finally, they can develop flexible MPA management strategies and boundaries to enable adaptation of MPA design and management to accommodate altering conditions caused by climate change.

Managing for social resilience

Heidi Schuttenberg, co-author (with Paul Marshall), *A Reef Manager's Guide to Coral Bleaching* (http://www.coris.noaa.gov/activities/reef_managers_guide). E-mail: heidi.schuttenberg@jcu.edu.au

Managing for ecological and social resilience recognizes that a process of uncertain change is underway, and aims to support the ability of the environment and dependent human communities to absorb shocks, regenerate, and reorganize so as to maintain key functions and processes. Rather than having a goal of maintaining circumstances as they are today, managing for resilience emphasizes protecting the factors that allow recovery after disturbance events. Additionally, this strategy recognizes that the future may be determined by unexpected changes, and it values the ability to be responsive to surprises.

On the social side, actions can be taken to support the human communities that depend on marine environments, such as fishers and tourism operators. Changes in resource condition are likely to cause changes in resource use patterns. Engaging with stakeholders during this reorganization will allow managers to build alliances, knowledge, and influence that can assist in effectively adapting management regimes to the new circumstances. Managers and resource users may wish to develop a climate change action plan that could include strategies for supporting ecological resilience, diversifying economic activities, enhancing human resource skills, making investments in capital and technology, or

Recent publications on climate change

Stern Review on the Economics of Climate Change, October 2006. Produced for the UK government by Nicholas Stern, former chief economist at the World Bank. http://www.hm-treasury.gov.uk/independent_reviews/stern_review_economics_climate_change/sternreview_index.cfm

"ITMEMS3 Statement on Coral Reefs and Climate Change", October 2006. Approved by attendees of the Third International Tropical Marine Ecosystems Management Symposium (ITMEMS3), Cozumel, Mexico. http://www.itmems.org/final/Statement_coral_reefs_climate_change_FINAL.pdf

"Dropping pH in the Oceans Causing a Rising Tide of Alarm", November 2006. Authored by Tundi Agardy and published in *The W2O Observer* newsletter <http://www.thew2o.net/newsletter.html>

reworking related government policies. As climate change makes life less predictable, such cooperative, adaptive approaches may be essential to achieving responsive, effective MPA planning and management.

Factors allowing for resistance to climate change

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The question is, what factors are likely to give sites the ability to resist climate change? In nearshore areas, these are moderately high background temperature and light variation, and reduced wind-driven water flow. These factors allow organisms to acclimate such that rare disturbances are not beyond their limits to acclimation. There are some areas where oceanographic factors result in sites that are not experiencing increases in water temperature, and these include some permanent (not seasonal) upwelling or high equatorial current-speed areas.

Canada's strategy for MPA planning amid change

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As one among several nations that have established comparatively few MPAs to date, a more relevant question for Canada is how climate change should be factored into its planning for an expanding MPA network. The need to exercise this opportunity is underscored by Canada's geographic setting as a mid- to high-latitude nation where climate change is already having noticeable effects, particularly in the Arctic. Rapid, on-going changes in the extent and seasonal duration of Arctic sea ice have been well-documented, and predictive models point to acceleration of these trends. Such climate-induced changes will affect not only the natural variability of marine ecosystems, including pole-ward range shifts for example, but the nature and

extent of human uses of these northern waters as well. Therefore, planning a network of MPAs requires consideration of both the biogeographic and socio-economic changes that may impinge on marine biodiversity.

Such considerations are being taken into account. As a member of the Arctic Council that links all nations bordering on the Arctic Ocean, Canada is a participant in the Arctic Marine Strategic Plan (<http://www.pame.is>) that includes the establishment of MPAs in the Arctic Ocean among shared objectives. Domestically, under Canada's Federal Marine Protected Areas Strategy (http://www.dfo-mpo.gc.ca/canwaters-eauxcan/infocentre/publications/docs/fedmpa-zpmfed/index_e.asp#toc), the three federal MPA agencies are developing a collaborative approach to MPA network design — one that will blend their distinct mandates, and those of provincial and territorial governments, to achieve an effective network of MPAs. This network will embrace the protection of biodiversity “hotspots” and critical yet separated life-stage habitats, especially those of keystone species. Other components will achieve broad representation of biodiversity within MPA boundaries, and replication and connectivity (particularly north-south) across the network will be objectives as a safeguard against climate change. Equally important, effective planning and management of this network will require integration into broad oceans management; monitoring programs to detect, assess and respond adaptively to change; and an expanded program to develop and sustain public awareness.

MPAs as showcases for sustainable living

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MPAs need to spearhead discussions and management of climate change locally, including through eco-technology and awareness raising. While tropical MPAs are typically located in areas that contribute few if any emissions causing climate change, their visitors often come from countries that are the main “culprits” — the US and Europe in particular. Therefore, to increase the political constituency for lifestyle change there, MPAs should actively promote environmental awareness among visitors, with on-site showcasing of eco-technology (renewable energy, waste, and water management) as well as exhibits of any visible damage or trends from climate change, based on monitoring findings. Our experiences with guests on Chumbe Island are that they are amazed how “simple” zero-emission guest facilities can be, without sacrificing comfort and beauty. MPAs should also offer environmental education for local governments and people, who often aspire to having energy-wasting “consumerist” lifestyles.

Be open to a variety of management options

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We should be open to a variety of options as we plan for the future. With such an approach, we can expect that at least some solutions will prove to be more successful than others.

First, our existing protected areas may be vulnerable to change, and I would suggest that efforts on expanding existing MPAs would be a good start. We need many more marine protected areas than our current dismal numbers.


As we focus on increasing the number of MPAs, we have an opportunity to address potential change. Our approach to conservation planning needs to take into account the best predictions of change and focus on possible implications of climate change. It would be beneficial to create MPAs that anticipate future biodiversity concentrations, as caused by shifts in ocean currents, upwellings, or estuaries. We need to envision the implications of rising sea levels on salt marshes and try to capture as many of the newly created marine life nurseries as possible.

How do we do this? A critical step is to continue to invest in the modeling of change and shifts in biodiversity. In parallel, we must remain committed to convincing fisheries authorities that MPAs are a necessity for the future of their industry. Likewise, fishers and local communities dependent on marine life for their livelihoods must be recruited to be the advocates for future MPAs. If there are no drivers beyond the conservation movement, the above planning ideas will be irrelevant musings.

Using MPAs to monitor change

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MPAs cannot by themselves protect against global climate change. However, it might be an idea to monitor the effect of global warming by ruling out anthropogenic effects through the use of MPAs. If so, MPAs need to be set up in areas where all anthropogenic effects (including long-distance transport of contaminants) are assumed to be negligible. These areas must have a size/scale assumed to be right for studying expected effects (such as species composition, production, and reproduction).

For conservation of fish stocks, it is important to know the fish migration in and out of the MPAs, which may change significantly due to changing climate. If we can anticipate how stocks might change their spawning and/or nursery grounds with respect to climate change, it might be an idea to set up long-term MPAs in today's spawning/nursery grounds and the anticipated spawning/nursery grounds to monitor the transition due to climate. 

MPA Perspective The Sea Search Partnership: A Community-Based Monitoring Program for MPAs in Victoria, Australia

By Rebecca Koss, Anthony Boxshall, and Peter Brown

Sea Search is a community-based monitoring program for the system of 24 marine national parks and marine sanctuaries in the state of Victoria, Australia. The program teaches volunteers and school groups how to identify and monitor marine flora and fauna in their local MPAs. Through this “citizen science” approach, Sea Search generates useful data for protected area management while fostering greater environmental awareness and stewardship in the surrounding population.

Launched in 2004, the program is directed by The People and Parks Foundation (an Australian NGO) and sponsored by Parks Victoria and ExxonMobil. Its monitoring protocols — which focus on intertidal rock platforms, subtidal reefs, and seagrass beds — were designed by Deakin University in conjunction with community groups, ensuring a user-friendly set of methods that require no prior scientific knowledge. The Sea Search procedures are published as part of the Parks Victoria Technical Series, and are available on the program website at <http://www.seasearch.org.au>.


Community and school groups work with Parks Victoria rangers and a Sea Search project officer to collect seasonal data in their local MPA and at nearby control sites. The data contribute to management planning, and will be added soon to a centralized database with links to management agency data. Through this database, community volunteers will be able to track changes in their local park over time. This “ownership” of the data by community groups helps increase their sense of responsibility for the site (i.e., the need to collect high-quality data) and their skills (in scientific techniques and identification), while fostering passion for the marine environment, self-esteem, and social connections within their local community.

Furthermore, the program’s partnership among Parks Victoria, ExxonMobil, Deakin University, and The People and Parks Foundation emphasizes to community members that Sea Search — and, by extension, their participation in it — is considered important and valued in state government as well as by corporate sponsors. The state’s 24 MPAs were designated in November 2002 and cover 5.3% of state coastal waters (*MPA News* 4:7).

Challenges and Lessons Learned

The creation of any environmental monitoring program entails challenges. Community-based monitoring programs such as Sea Search automatically include an additional dimension of social agendas. To ensure the program meets the goals of park management and

community groups, we have found it important to address the following issues:

1. The program must be real for the management agency and other partners, with clear objectives and responsibilities: volunteers will see through token programs immediately. The agency must explain what questions it wants answered, and how data collected by community groups will be integrated into management goals and projects.
2. The commitment from institutional partners must more than match the volunteer’s commitment in terms of money, time, or other considerations. Volunteers should not be treated as a “free workforce” to meet agency ends and requirements, and their contributions should be valued and acknowledged by project and agency staff.
3. Monitoring methods must be scientifically robust to be useful, and should complement other data. It may be a waste of time collecting data that are incompatible with existing datasets. The methods must have acceptability among scientific peers.
4. Monitoring methods must be relatively easy for volunteers to apply. Feedback from volunteer trials is invaluable for creating user-friendly techniques.
5. Community groups will generally require agency support (logistical and financial) to assist with collection and maintenance of the data. The agency should also supply monitoring equipment to community groups — who generally cannot afford the out-of-pocket expenses required to complete monitoring surveys — and continually maintain that equipment. Volunteers become frustrated when equipment does not work.
6. Training in identification of marine flora and fauna is a must for community groups. Without it, volunteers will be unable to collect data correctly. In addition, ongoing data-quality assurance is vital for the program to be successful.
7. Engagement of corporate sponsors encourages social responsibility on the part of these corporations, and can facilitate opportunities for their employees to become active volunteers for the monitoring program.
8. This type of community monitoring program requires a project officer to work with agency staff and serve as a point of contact for volunteers. This person liaises between organizations; organizes the monitoring surveys with community groups and agencies; provides on-the-ground administrative presence during the surveys; offers support to volunteers through training and identification; and manages daily administration of the program. 

Editor’s note:

Rebecca Koss, with The People and Parks Foundation, is project officer for Sea Search, the program described in this essay. Anthony Boxshall is manager of marine national parks research for Parks Victoria. Peter R. Brown is chief executive officer of The People and Parks Foundation.

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Results from the *MPA News* Reader Poll: The Relationship between MPAs and Ecosystem-Based Management

The October 2006 edition of *MPA News* featured an article on the role of MPAs in ecosystem-based management (EBM), and vice versa. We invited readers to participate in a short online poll on the subject, with the goal of measuring baseline attitudes on the relationship between these management measures.

Several dozen readers from around the world participated in the poll — thank you. A summary of your answers is below. Three respondents were selected at random to receive an *MPA News* canvas tote bag. As ecosystem approaches to marine resource management become more widely applied, *MPA News* will continue to examine their evolving relationship with MPAs.

Poll results:

Question 1. Can an MPA be successful if there is no ecosystem-based management of adjacent water and land outside the MPA?

Answer:

Yes	52%
No	48%
Don't know	0%

Samples of explanations from respondents:

“Yes. If an MPA is intended to protect cultural resources, for example, then it may be successful irrespective of ecosystem-based management in adjacent waters. However, if its purpose is habitat protection or replenishment of stock — or even protection of a representative community — then success is dubious without ecosystem-based management in adjacent areas.”

“Yes, but only if the MPA encompasses a complete ecosystem, as does the Great Barrier Reef Marine Park. Otherwise, because of the interconnectivity of the sea, the answer would generally be ‘No’.”

“No. The essence of the ecosystem approach is in coping with the dynamic nature of marine systems. While an MPA can protect habitat within its boundaries, many of the species being protected are dependent on propagules from outside the area — hence that outside supply needs to be protected.”

“No, not any more. MPAs’ very existence is attracting more and more development around them. The more

scarce these ‘quasi-pristine’ areas are, the more people want to visit them and do business there.”

Question 2. Can ecosystem-based management be successful if MPAs are not used as a component in that management system?

Answer:

Yes	46%
No	48%
Don't know	6%

Samples of explanations from respondents:

“Yes. There are many situations in which MPAs are not necessary to achieve EBM goals. For example, in many areas land-based sources of pollution are a more drastic problem than fishing pressure. A traditional community-based fishery that is well-managed in terms of gear and effort can be part of an overall EBM plan, and MPAs may not be necessary for such a plan to work.”

“Yes. MPAs can be tools or provide a framework, but are not the only solution. However, since human nature seems to understand black-and-white uses better than gray areas in management, this makes MPAs a logical product of EBM.”

“No. One reason why EBM risks failure without some areas managed primarily for conservation is that adaptive management — a key part of putting EBM into practice — requires controls. Such controls also provide fail-safes by conserving ecosystem components needed to rebuild in the case of poor management decisions.”

“No. Since an effective, comprehensive coastal EBM plan is a dream for most countries, MPAs are so far the only existing tool to establish real managed areas, no matter how small the MPAs are.”

Question 3. If you can, please give examples of places where you think ecosystem-based management is being implemented effectively.

Answer: The most common answer given was the Great Barrier Reef Marine Park, mentioned by 20% of all respondents. Other places mentioned by multiple

Paper available on MPAs in ecosystem-based management


The US Marine Protected Areas Federal Advisory Committee has released a white paper on the role that MPAs can play in implementation of ecosystem-based management, particularly in the US context. The paper, “Marine Protected Areas: Fundamental Tools for Ecosystem-Based Management”, is available at http://www.mpa.gov/pdf/fac/mpafac_letter_mem_1106.pdf.

respondents included Palau (7%) and the Wadden Sea (4%). However, more than half of respondents (52%) either skipped this question — implying they were unaware of any cases of successful EBM — or explicitly answered that they knew of no successful cases.

Question 4. What would help ecosystem-based management to become more widely practiced? (From a list of 10 options, respondents were asked to check all that were applicable.)

Answer: The answers were, with the percentage of respondents who selected each one:

- Better coordination between and within agencies (83%)
- Lesson-sharing among practitioners (72%)
- Training for practitioners (70%)
- Improved scientific information (63%)
- More widely available decision-support tools and models (61%)
- Greater clarity in EBM terminology (61%)
- EBM implementation guidelines and/or support documents (59%)
- Easier-to-use decision-support tools and models (59%)
- More peer-reviewed publications that address EBM (37%)
- Other (54%)

Respondents who checked “Other” suggested the following measures were also needed: education of decision-makers/stakeholders; more funding; better governance; and improved enforcement capacity. 

Notes & News

World Bank releases report on scaling up MPAs

The World Bank has released a report that assesses factors likely to determine MPA success and identifies opportunities for the Bank and its partners to scale up MPA implementation to meet global conservation targets, such as those set at the World Summit on Sustainable Development (*MPA News* 4:3). The report focuses on the intersection of MPAs and poverty. It examines how best to capture the potential benefits of MPAs for helping the world’s poor, while addressing the sociocultural and political realities of restricting access to the sea and regulating what has traditionally been considered common property. Included are studies of MPA implementation in three countries — the Philippines, Chile, and Brazil. The 100-page report, *Scaling Up Marine Management: the Role of Marine Protected Areas*, is available in PDF format at http://siteresources.worldbank.org/INTCMM/Publications/21108865/Final_Printed_Version_MPA_ESW.pdf.

Report proposes MPA-planning framework for eastern Canada, northeastern US

A new report co-produced by WWF-Canada and the US-based Conservation Law Foundation applies a MARXAN-centered framework to propose a network of priority areas for marine conservation in eastern Canada and the northeastern US. (The planning framework was detailed in a sister publication, released in October 2006 by WWF-Canada [*MPA News* 8:5].) The report marks the culmination of a six-year collaboration between the two NGOs. *Marine Ecosystem Conservation for New England and Maritime Canada: A Science-Based Approach to Identifying Priority Areas for Conservation*, is available in PDF format at <http://www.wwf.ca/marinepriorityareas>.

Report: Consulting firm examines Australian MPA processes

One of the world’s largest business-consulting firms has produced a report on the designation of MPAs in Australia. In the 195-page report *Australia’s Marine Protected Areas: Challenging Times Ahead*, the firm Ernst & Young examines why and how MPAs are being designated there, and recommends a strategy for improving the effectiveness and efficiency of these MPAs. The report was prepared for two industry groups — the Australian Fishing Tackle Association (AFTA) and the Boating Industry Association of New South Wales. It is available online at <http://www.afta.net.au>.

Paper available on lessons from Victoria (Australia) MPA planning

A new paper in the journal *Ocean & Coastal Management* (vol. 49, no. 12) describes lessons learned from a 10-year public process to plan a network of MPAs in the Australian state of Victoria. The Victoria government approved the network in 2002 (*MPA News* 4:7). Paper reprints of the journal article, “The long and winding road: The development of a comprehensive, adequate and representative system of highly protected marine protected areas in Victoria, Australia”, are available from the author — Geoff Wescott of Deakin University — at geoffrey.wescott@deakin.edu.au.

Report: Synthesizing all natural knowledge at a Canadian coastal park

The Gwaii Haanas National Park Reserve and Haida Heritage Site, on the Pacific coast of Canada, has released a 413-page report synthesizing nearly all

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information available about the site — traditional indigenous knowledge, modern human uses, geology, biodiversity, habitat distribution, and more. It is the fifth report in a series of baseline marine science inventories for the Haida Gwaii region, also known as the Queen Charlotte Islands. Report editor Norm Sloan says a synthesis such as this is particularly helpful for remote areas with histories of relatively little scientific synthesis. "The Haida Gwaii region is Pacific Canada's most isolated archipelago with a population of just 5000 people spread across six communities, all in very rural settings," he says. "So there is little resident technical infrastructure, yet a great need for technical information, given current land-use planning and marine conservation planning processes [for an adjacent proposed National Marine Conservation Area] underway." For a hard copy of the report *Living Marine Legacy of Gwaii Haanas V: Coastal Zone Values and Management around Haida Gwaii*, e-mail Norm Sloan at norm.sloan@pc.gc.ca, or provide an FTP site to which the document may be sent.

Conference session to share lessons between terrestrial, marine protected areas

The 21st Pacific Science Congress — to be held 12-18 June 2007 in Okinawa, Japan — will feature a half-day session focusing on lesson-sharing between management of terrestrial and marine protected areas in the Asia-Pacific region. Topics will include establishing successful models of community-driven conservation, incorporating future climate change into resource management, and other subjects. For more information on the session, e-mail John Burke Burnett at burnett@bishopmuseum.org. Background information on the Congress in general is available at <http://www.psc21.net>.

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Research Spotlight: The EMPAS Project

A project is underway to develop fisheries management plans for MPAs within the German EEZ of the North Sea and Baltic Sea. Called the *Environmentally Sound Fishery Management in Protected Areas* project (EMPAS), it is analyzing conflicts between nature conservation goals and fishing activities. In evaluating all fishing activities of all fleets operating in and adjacent to the 10 sites, EMPAS is expected to significantly improve the quality of data used in studying such conflicts. The project was initiated in 2005 by the German Federal Agency for Nature Conservation and the International Council for the Exploration of the Sea (ICES), and will deliver its recommendations to the German government.

The 10 sites under study were nominated to the European Commission by Germany in 2004 to bring the nation into compliance with the EU Birds and Habitats Directives. Two of the nominated MPAs are designed specifically to protect birds, and took effect immediately upon nomination; the remaining eight are to protect fauna, flora and/or habitats and are still under consideration by the European Commission. The EU Birds and Habitats Directives aim to maintain biodiversity through conservation of species and natural habitats, including development of a coherent European ecological network of protected zones by 2010 — called the Natura 2000 network. In total, the 10 sites comprise 31.5% of Germany's EEZ in the North and Baltic Seas combined.

The EMPAS management plans, which could involve a mix of spatial and temporal regulations, will apply only to the 10 sites, not to adjacent waters. However, project coordinator Søren Anker Pedersen of ICES says he expects the proposals and lessons learned from EMPAS to be useful for other projects to develop ecosystem-based fisheries management plans in EU waters, whether inside or outside of MPAs.

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