

Finding the Balance: Strengthening MPA Governance by Mixing Top-Down, Bottom-Up, and Other Approaches

It is increasingly recognized that “top-down” and “bottom-up” approaches are critical to governing MPAs. That is, MPAs should combine the benefits of state control and binding legislation (top-down) with the benefits of community-based approaches that empower local people and involve them in decision-making (bottom-up). By pairing the approaches, an MPA gets regulations that are acceptable to an engaged and supportive community.

There is a third approach as well. To further strengthen community support for an MPA, managers are encouraged to harness the power of market forces. This could include fostering profitable alternative livelihoods that are compatible with an MPA’s goals, or attaching property rights to environmental resources.

All of this makes sense. But how these three main approaches (top-down, bottom-up, and market-based) should be combined in practice, and in different contexts, remains a challenge.

A new UNEP study aims to help clarify these matters. Led by researchers at University College London (UK) and Dalhousie University (Canada), the study draws

lessons from nearly two-dozen MPA case studies from around the world. Within the framework of the three main governance approaches described above, the study describes 40 separate strategies — or “incentives” — that can be used to steer community compliance with MPA regulations (see box). It also shows how each of the MPAs under study is applying its own unique mix of these strategies to fit its specific context.

The UNEP study’s main message is that the more diverse an MPA is in its application of governance strategies, the more sustainable it will be. In other words, it can better withstand the unbalancing effects of various drivers (e.g., global fish markets, incoming users, etc.) that could undermine the MPA’s effectiveness. “It is clear from these case studies that MPA governance should be considered in terms of how incentives can be combined, rather than whether any particular category of incentives is ‘best,’” states the study report.

Below, MPA News talks with the study’s three authors — Peter Jones, Wanfei Qiu, and Elizabeth De Santo —

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Governance incentives

There are many types of strategies that managers can apply to steer stakeholders toward complying with an MPA’s regulations. The UNEP study calls these steering strategies “incentives”, and identifies 40 of them. It organizes these incentives into categories that mirror the three main approaches to governance — legal incentives (consistent with top-down governance), participative incentives (bottom-up governance), and economic incentives (market-based approaches). It also adds two more categories that can be combined with these three approaches: interpretative incentives and knowledge incentives. Here are examples of each:

- **Legal incentives** — Example: Clarity and consistency in defining the legal objectives of MPAs, general and zonal use restrictions, and the roles and responsibilities of different authorities and organizations. [Note: Legal

incentives, as this study uses the term, are often mandates by another name.]

- **Participative incentives** — Example: Bringing in neutral facilitators to support governance processes and negotiations, or training state employees to do so.
- **Economic incentives** — Example: Promoting the “green marketing” of tourism, fisheries, etc. products from the MPA to increase profits through price premiums.
- **Interpretative incentives** — Example: Promoting recognition of and respect for the MPA’s regulations/restrictions, including the boundaries.
- **Knowledge incentives** — Example: Developing mechanisms for independent advice and/or arbitration in the face of conflicting information and/or uncertainty. 

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about their findings and how an MPA can know when it is applying the right mix of approaches.

How does an MPA know when it has the balance right in terms of the strategies it is applying? Or is the key simply to continue adding more and more strategies?

Elizabeth De Santo: We don't think that increasing governance complexity is something that needs to be done in perpetuity. When is the balance right? When you're achieving conservation objectives and can say, yes, this MPA is doing its job effectively. However, one also has to be open to the flexibility necessary for adaptive management approaches, and thus the complex balance necessary for achieving successful governance needs to be adaptable as well. So it is not necessarily about layering on more governance measures, but rather being open to changing the relative proportions of what is in place in order to meet new challenges.

Peter Jones: Increasingly, I tend to think more in terms of "seeking a good blend" of incentives, as socio-ecological governance systems are arguably too complicated and dynamic to be considered in terms of "getting the balance right." It is similar to how the thinking moved from talking in terms of the "balance of nature" towards a more dynamic representation of complex ecosystems, with the emphasis on promoting resilience. If you think you have "got the balance right," it probably means that you will soon be stumbling. The emphasis should always be on being ready for the unbalancing effect of driving forces. Borrowing further from thinking about ecosystem resilience, the report concludes that "resilience in MPA governance frameworks is woven by complex webs connecting incentives from all categories." So the key to effective and equitable MPA governance is seeking to combine different incentives rather than just getting the balance right or maximizing the diversity of incentives.

Wanfei Qiu: In seeking to get the balance right in governing MPAs, it is important to recognize the linkages and inter-dependence between different incentives. For example, market incentives such as territorial user rights in fisheries (TURFs) can be very effective in promoting sustainable resource use. But they often require a legal basis to ensure that the rights of TURF owners are protected and their obligations are fulfilled. I tend to think of the balance in an MPA governance system as a dynamic one, with interconnected incentives designed to maximize the resilience of the system against forces of change.


Can you provide an example of an MPA that has actively broadened its base of incentives?

Jones: The Wash and North Norfolk Coast European Marine Site in the UK could easily have attempted to rely largely on its strong legal framework under European legislation. But the lead fisheries management authority chose to pursue a more participative approach that provided for local users to influence decisions and bring their knowledge into the processes. While legal incentives are still important and there have been conflicts, this case represents an excellent example of how different incentives can be combined.

De Santo: The US National Marine Sanctuary Program, as a system of 14 MPAs designated over nearly 30 years, is a good example of an adaptive governance approach. Each MPA's management plan is tailored to the context in which it is set, incorporating lessons learned from designation and management in other areas, and including adaptive management. We hope that our study and its next phases can provide this kind of shared experience and knowledge for other MPAs in the world, especially those that do not have the learning benefits from being in a system of MPAs.

In analyzing the 20 MPAs in your study, you asked which incentives were needed to improve governance in each case. Legal incentives (in other words, laws and penalties to steer human activity) were cited more often than the other categories of incentives combined. Does this mean that the other types of incentives are not as important as laws for helping MPAs reach their goals?

De Santo: We would not say that other incentives are less important. However, having a strong legal base for designation, monitoring, and enforcement of MPAs is clearly a necessary prerequisite for effective conservation.

Jones: While legal incentives are important, they cannot alone achieve the effective and equitable governance of MPAs. It is a bit like the legs of a chair — they are all important. 

[The UNEP report *Governing Marine Protected Areas: Getting the Balance Right* is available at www.mpag.info.]

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What Are the Main Challenges Facing the MPA World?

Underlying each edition of MPA News is a question: namely, what are the challenges that MPA practitioners face in aspects of MPA planning and management, and how are they addressing those challenges? Whether a particular article involves building MPA networks, or addressing an oil spill, or partnering with indigenous populations (to name some topics from this year's issues), the responses from practitioners are enlightening and are woven into the article.

Occasionally, however, we take a broader approach, asking practitioners for their insights on the main challenges facing the field. Below are responses from four experts, each of whom answered in the context of a particular country, region, or the field as a whole.

Challenge facing MPAs in Caribbean: Lack of political will

Alessandra Vanzella-Khouri, Senior Program Officer, Specially Protected Areas and Wildlife (SPA), UNEP Caribbean Region, Jamaica. E-mail: avk@cep.unep.org

The lack of political will is at the core of the many challenges that MPAs face in the Caribbean. From this lack of will stems the fact that management is weak or nonexistent for many, if not most, of the designated MPAs in the region. The resources (financial and human) are not being provided to help MPAs meet the conservation objectives for which they were established.

The true value (economic, ecological, cultural, aesthetic, etc.) of the natural resources protected within MPAs is not recognized by the politicians, decision-makers, or civil society at large. This is partly our own fault: environmentalists and scientists have not been creative or strategic enough in delivering the messages. The links between the MPAs and their economic importance to a country (supporting tourism, fisheries, coastal protection, and more) are not sufficiently emphasized. Nor are the vulnerability and fragility of the resources being protected. This has not been embedded in the internal national planning processes of nations.

Once MPAs are designated, they are all too often treated as if they are on their own, and must find solutions in isolation on how to survive. This means surviving not only in the financial sense, but also surviving among all the development pressures around them, as well as changing and conflicting policies and more. MPA objectives are being undermined by development and other actions endorsed by the same policy-makers who designated the MPAs in the first place.

Even when there are external financial resources to support/strengthen MPAs, management often doesn't have the capacity to handle and manage the funds.

They don't have the basic infrastructure, staffing, or even information to enable them to receive funds from donors. Again, this could all be changed with sufficient political will.

Challenge facing large remote MPAs: Surveillance and enforcement

Jeff Ardron, High Seas Director and Co-Lead on Surveillance and Enforcement of Remote Maritime Areas Project, Marine Conservation Institute, Washington, DC, US. E-mail: Jeff.Ardron@marine-conservation.org

The main challenge facing large remote MPAs is ensuring compliance in an affordable manner. This is particularly so for fisheries vessels, which are currently exempt from most international shipping reporting requirements. It is not that remote surveillance and enforcement need to be expensive, but rather that existing fisheries management systems suffer from two anachronisms that make it expensive: 1) they often do not consider remotely gathered evidence as sufficient for a successful prosecution; and 2) they allow offshore fishing activity a level of secrecy that it should not have.

Regarding the first impediment: this reluctance to accept data/evidence from new and emerging remote technologies — such as autonomous underwater vessels, acoustic recorders, mandatory automatic identification systems, and more — means that enforcement is largely confined to using conventional boats and planes that are very expensive, especially when sent hundreds of miles offshore. This makes it all but certain that illegal, unreported, and unregulated (IUU) fishing will continue. While there will always be a need for conventional enforcement like boats and planes, the time has come to expand the surveillance and enforcement toolkit.

Regarding the second impediment: states are increasingly aware that offshore fishing vessels, with all their data secrecy and exemptions from international shipping requirements, pose the potential for significant maritime security risks. Unless these loopholes are closed, they allow for an incident to occur that could impact national or international security and safety. Vessel monitoring systems (VMS), currently the option of choice for remote fisheries management, could soon become obsolete unless flag states and fisheries authorities are willing to share the data on a near-real-time basis, and to increase the reporting rate to something useful for true maritime enforcement, like 10- or 15-minute pings. (It is hard to tell what a vessel is doing if the VMS pings only once every hour.) National and international maritime security is an increasing concern and will soon trump the antiquated notion that fisheries

should be treated differently from other maritime shipping. (For more background on this: <http://pacmara.org/surveillance-and-enforcement-of-remote-maritime-areas>.)

In this transition to integrated “maritime domain awareness” (i.e., a government’s effective understanding of everything associated with its maritime domain) across agencies in the interest of security, the major threat to large remote MPAs — IUU fishing — could largely be addressed. The only remaining issue would be if fisheries authorities are willing to participate in integrated maritime management, with multi-agency sharing of data streams.

Challenges facing MPAs in Japan: Communicating science and strengthening local MPAs

Takaomi Kaneko and Mitsutaku Makino, Researchers, Fisheries Research Agency, Japan. E-mail: takaomi@affrc.go.jp

One challenge is the difficulty of coordinating the various interests of local stakeholders, which is inevitable for introducing new MPAs in Japan. Such “interests coordination processes” often become the barrier against adoption of fundamental and drastic measures needed to change the marine environmental situation. In support of protective management actions, scientists often try to explain the fruits of ecosystem conservation or biological diversity to all stakeholders, but it is very difficult. Ideally, periodic revisions and adaptive improvements of MPA design should be based on the best scientific knowledge available.


Another challenge relates to autonomous MPAs (AMPAs), a type of MPA in Japan that is implemented based on local initiatives. Such AMPAs usually have weak binding powers, so if some stakeholders break the rule, they may be not punished. This leads to moral hazards. Local government should provide legal support for AMPAs: for example, the users of ecosystem services, including the fishing industry, should be held accountable for sustainable use and this should be clarified in the legal framework.

Challenge facing MPAs globally: A false sense of security

Peter Jones, Senior Lecturer, Department of Geography, University College London, UK. E-mail: p.j.jones@ucl.ac.uk

A big challenge is to ensure that MPAs are effectively implemented. I worry that we could lull ourselves into a false sense of security because we are moving towards some notional target for MPA percentage area coverage (namely to meet national goals under the Convention on Biological Diversity). This is particularly through the push for more and bigger MPAs, many of which are for areas not particularly threatened, are not being effectively protected, or are politically and socially unsustainable, as in cases where MPAs are designated over the objection of local or traditional populations.


We must also focus on ensuring that MPAs are properly implemented through effective and equitable governance approaches. The driving forces that could undermine marine conservation — such as the increasing reach of, and demands for, seafood and coastal tourism — are growing. We must ensure that MPAs can withstand the potentially perturbing and undermining effects of these driving forces. Sometimes MPAs may be able to harness such driving forces and sail in their wind, but they must also be able to withstand them.

I also worry that we could be swayed by arguments that improvements in marine spatial planning (MSP) and fisheries management will negate the need for MPAs. The reality is that MPAs are the cornerstone, if not the foundation, of ecosystem-based MSP and fisheries management. No approach alone can ensure that we have resilient and diverse marine ecosystems that sustainably provide vital flows of ecosystem services, but MPAs remain a critically important tool for achieving this. However, MPAs must also be effectively implemented, be they smaller areas in more intensively used inshore seas or larger areas in more remote areas. 

Notes & News

Palau signs agreement with Sea Shepherd to patrol shark sanctuary; Japan objects

Palau has signed a memorandum of agreement with the US-based Sea Shepherd Conservation Society for the NGO to protect the country’s waters against shark fishing. Fishing for sharks is banned in Palau; its waters are designated a shark sanctuary. The agreement would allow Sea Shepherd to use one of its vessels to patrol Palauan waters against poaching operations, at Sea Shepherd’s expense. It is similar to an agreement the NGO holds to patrol the Galápagos Marine Reserve in Ecuador (MPA News 11:5 and 3:4).

Sea Shepherd has established a reputation for employing aggressive actions against fishing operations it considers illegal, including Japan’s hunting of whales. As a result of the latter case, the Japanese government considers Sea Shepherd to be a terrorist organization and has objected to Palau’s signing of the shark-patrol agreement. Japan has made a counter-offer to patrol Palau’s waters with its own vessel. The agreement with Sea Shepherd is now on hold as Palau considers Japan’s offer. 

Australia Announces Plan for Large Network of MPAs off SW Coast

The Australian Government has released a proposal for a network of eight new MPAs for the country's South-west marine region. The network would be substantial: it would cover a total area of 538,000 km², or roughly 40% of the region's Commonwealth waters, which start 3 nm off the coast. The proposal was released alongside a draft marine bioregional plan for the country's southwestern waters. Both proposals are now open for public comment.

Although the Government refers to the proposed MPAs as "marine reserves", which often connotes no-take restrictions, the sites would allow extractive activity in some areas. As laid out, the new MPAs comprise three types of zones:

- Marine National Park zones: excluding all commercial activities and extractive recreational activities, except for vessel passage and non-extractive tourism.
- Multiple Use zones: allowing a range of existing activities to continue while excluding activities that carry a high risk to the conservation values of the MPAs. Under the proposal, excluded activities would include demersal gillnetting, demersal longlining, and demersal trawling.
- Special Purpose zones: allowing a wider range of commercial activities than in the multiple-use zones. Under the proposal, demersal trawling would be the only fishing method excluded from the special purpose zones.

However, the size of the no-take portions is significant — 53% of the proposed network's total area. Most of that is provided by the largest of the proposed sites: the


322,000-km² South-West Corner Commonwealth Marine Reserve, of which 77% (249,180 km²) would be zoned as no-take.

Announcing the proposal, Australian Environment Minister Tony Burke said, "We have a once in a generation opportunity to put in place the measures needed to protect our precious marine environment for future generations."

Impacts on fishing

In selecting the proposed MPAs, the government sought to represent all depth ranges, large-scale ecological features, and seafloor features in the marine region. It also sought to avoid the areas of highest use by, and value to, the commercial fishing industry. However, the government expects that of the 24 fisheries operating in the region, 16 may be affected, and some of these may experience significant displacement of fishing effort. According to a government analysis, the proposed network could displace fisheries catch worth 1-2% of the gross value of production of the region's fisheries. The Great Australian Bight Trawl Fishing Industry Association has already called the size of the proposed South-West Corner MPA excessive.

The government recently announced its policy on compensating displaced commercial fishing operators and fishing-dependent communities as part of its effort to establish a representative network of MPAs country-wide by the end of 2012 (see news brief on page 7).

The MPA network proposal and draft bioregional plan are open for public comment until 8 August 2011 at www.environment.gov.au/coasts/mbp/south-west/index.html. 

Comparing the Costs of Large vs. Small MPAs, and No-Take Areas vs. Multi-Use MPAs: Interview with Natalie Ban

Larger MPAs generally cost less to manage per unit area than smaller ones, and no-take areas are cheaper to manage than multiple-use MPAs, according to a study by an Australian research team, published in the journal *Conservation Letters*. The study estimated the management costs of two scenarios for a potential MPA in Australia's Coral Sea: one a single large no-take area, the other a multi-use MPA of which nearly one third was no-take.

The bottom line: annually, it would cost 70% more to manage a large multiple-use MPA than to manage a no-take area of the same size, according to the team's

estimates. This is primarily due to the costs of compliance and enforcement, they write. In short, the zoning in a multi-use area makes compliance more challenging, leading to more offenses and an increased need for monitoring and enforcement activity.

Led by Natalie Ban of James Cook University, the research team used three models to estimate costs: an existing model of global MPA management costs, a new statistical model based on Australian MPA management costs, and expert estimates derived from the management costs of the adjacent Great Barrier Reef Marine Park.

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The findings are relevant to current Australian policy-making. The Australian Government has designated the country's portion of the Coral Sea as a Conservation Zone for interim protection, and is assessing its possible inclusion in one or more Commonwealth MPAs. The Coral Sea Conservation Zone covers approximately 972,000 km² of Australian waters. Some conservation groups, like Pew Environment Group, are advocating 100% no-take coverage for the entire area, whereas a 30% no-take scenario would more closely approximate the no-take coverage of the Great Barrier Reef Marine Park.

An intriguing finding from the study: once an MPA reaches a very large size, its per-unit management cost may start increasing again. Natalie Ban spoke with MPA News about this phenomenon and her study's findings in general:

MPA News: You focused your calculations on one case: a Coral Sea MPA. Can your findings be generalized to MPAs elsewhere in Australia and the world?

Natalie Ban: Our estimates of management costs for protection scenarios of the proposed Coral Sea MPA were based on budget data from Australian Commonwealth MPAs and expert interviews. The expert interviews were specific to the Coral Sea, but the statistical model we used to estimate management costs is applicable to small and large MPAs elsewhere in Australia. We do not know whether Australian data reflect global patterns of management costs.

MPA News: You found that management costs per unit area generally decrease as an MPA increases in size. However, you also determined that in the case of very large MPAs, a certain threshold size is reached where management cost per unit area actually starts to increase again. You refer to this rebounding trajectory in cost as a "polynomial relationship". Can you explain this?

Ban: It makes sense that the per-unit management cost cannot decline indefinitely for really large MPAs, because then it would cost essentially nothing to manage these areas. We know this cannot be true.


Here is one way of thinking about the scale issue. Enforcement effort can stay relatively constant until an MPA or network of MPAs reaches a certain area. A single vessel is required for one small MPA and might also be adequate for two small MPAs, although 1.5 times the vessel time could be required. If a single medium-sized MPA is configured to encompass the two

smaller MPAs and additional waters, a single vessel could still be sufficient because the distance traveled is the same and there is less perimeter to patrol, resulting in a decreased per-unit-area cost and displaying an economy of scale. The same economies of scale might not hold when an MPA reaches a threshold area. If the MPA becomes very large, two vessels could be required to effectively patrol the perimeter, increasing management costs for compliance in absolute and per-unit-area terms. The additional vessel is an example of a stepped fixed cost. Together with variable costs (e.g., fuel, staff time), this would translate into the kind of polynomial relationship that we found for Australia between management costs per unit area and total area.

MPA News: In your view, does that polynomial relationship provide an argument against establishing really large MPAs?

Ban: Many factors in addition to management cost are important to consider when assessing potential sizes and configurations of MPAs. When considering only management cost, it would still be more cost-effective to have one large than two smaller MPAs, because it is so much more expensive per unit area to manage smaller areas.

MPA News: Earlier this year, a team at the University of British Columbia in Canada published a study analyzing the cost of establishing MPAs, as opposed to managing them ("Understanding the cost of establishing marine protected areas", McCrea-Strub et al., *Marine Policy* 35[1], 1-9). How do your findings compare to theirs?

Ban: Their findings were similar to ours in that they also found that larger areas are cheaper to establish per unit area than small ones. However, they did not find a polynomial relationship, and thus their study suggests that establishment costs are less per unit area even for extremely large MPAs, such as our Coral Sea scenarios. A polynomial relationship between size and cost might not be expected in establishment costs because they may be comprised predominantly of fixed costs that are not tied to the size of the MPA. For example, the quantity of staff and software needed for the planning phase of a marine park may be the same regardless of the size of the planning region, therefore resulting in a linear decreasing per-unit establishment cost as a function of MPA size. However, their study nicely complements ours, because both establishment and management costs are important to think about at the beginning of an MPA planning process. 

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"Promise and problems for estimating management costs of marine protected areas" appears in *Conservation Letters* (2011) 1-12. For a copy, e-mail Natalie Ban at the address above.

Notes & News

Correction

In the March-April 2011 issue of MPA News, the article “In Colombian MPA, Management Files Suit to Stop Oil Exploration Inside Boundary” misidentified Marion Howard’s affiliation with CORALINA, the Colombian government environmental authority for the San Andres Archipelago. Marion Howard is MPA advisor to CORALINA, not MPA coordinator.

Australia sets new policy on compensating displaced fishers

The Australian Government has announced its policy on compensating commercial fishing operators and fishing-dependent communities who are impacted by the designation of new Commonwealth no-take marine reserves. Called the Fisheries Adjustment Policy, it outlines the principles for providing assistance and broadly describes how the level of financial need will be calculated case by case, based on catch records and other industry information. The policy allows for communities and stakeholders to participate in the design and implementation of regional structural adjustment packages.

The policy is nearly identical to the one announced in 2004 by the previous government of Prime Minister John Howard. It remains unclear how the new policy’s implementation will differ from the Structural Adjustment Package that was applied following re-zoning of the Great Barrier Reef Marine Park. That program, managed by the Australian Government from 2004-2010, suffered from continual expansions in scope and nearly uncontrolled costs, causing it to balloon from an initial estimate of A\$10 million to at least A\$214 million (MPA News 12:5).

The current government under Prime Minister Julia Gillard has committed to the development of marine bioregional plans and new marine reserves in four identified regions across Australia, and the adjustment policy is intended to support that effort. A draft bioregional plan and marine reserve network for Australia’s South-west marine region has just been released (see page 5, this issue), and draft bioregional plans and draft marine reserve plans for the North, North-west and East regions will be announced later this year. A final network of marine reserves is expected to be in place by the end of 2012.

The new Fisheries Adjustment Policy is at www.environment.gov.au/coasts/mbp/about/policy.html.

Chile and US cooperating on MPAs

Under an environmental cooperation agreement between the two nations, Chile and the US have established a sister park arrangement between Francisco Coloane Marine Protected Area (Chile) and Glacier Bay National Park (US). Through the partnership, the two MPAs will collaborate to hold workshops, staff exchanges, and other activities to improve management of each site and support long-term protection of natural resources in each country.

Although located more than 10,000 km from each other, the MPAs are quite similar: they share a common climate and geography (glaciers descending to the sea) as well as similar activities (outdoor recreation, tourism, and commercial fishing). They also face similar challenges, as both parks lie near major shipping channels and support multiple endangered species, including whales. For more information on the cooperative arrangement, go to www.state.gov/g/oes/env/trade/chile/158714.htm.

Impacts of the March 2011 earthquake and tsunami on Japanese MPAs

As described to MPA News by Takaomi Kaneko and Mitsutaku Makino, both of Japan’s Fisheries Research Agency:

“The majority of Japan’s MPAs are ‘managed resource protected areas’ (IUCN category VI — www.iucn.org/about/work/programmes/pa/pa_products/wcpa_categories) maintained mainly by local Fisheries Cooperative Associations, which are groups of local fishers. FCAs are indispensable for planning, implementing, and monitoring MPAs — especially the autonomous MPAs that are implemented based on local initiatives. However, many facilities for fisheries were destroyed by the quake and tsunami, a lot of FCA members are dead or still missing, and survivors cannot go fishing because they lost their fishing vessels. This means the functions of FCAs as fish producers and as the local management authority for MPAs have been completely paralyzed.

“Also, the quake has dramatically changed the geographic and biological conditions for the coastal ecosystem in this area [eastern Japan]. At the moment, we don’t have enough scientific data to understand such changes. Also, fishing data are not available because the fisheries operations are not yet fully resumed. We are now starting to collect such data, and once the changes in biological and geographic conditions are clarified, we think MPAs in this area should be redesigned according to those changes.”

For more information:

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Guide on ecological scorecards for MPAs

A new manual analyzes the use of marine ecological scorecards and other tools to assess and report on the condition of MPAs, including trends in water quality, habitat, and living resources. The guide then presents a standardized marine ecological scorecard and condition report that has been tested at 10 MPAs along the Pacific coast of North America.

It was developed by the trilateral Commission for Environmental Cooperation of North America (involving Canada, Mexico, and the US). The guide is intended to help measure the progress of North American MPAs toward maintaining and improving ecosystem quality. *A Guide to Ecological Scorecards for Marine Protected Areas in North America* is at: www.cec.org/Storage/98/9685_Marine_scorecard_en.pdf.

Report: assessment of coral reef resilience in Bonaire MPA

A new report from IUCN examines coral reefs in Bonaire National Marine Park in the southern Caribbean, and assesses their resilience to climate change and other threats. The study describes the rapid assessment protocol that was designed for the project, and offers recommendations to help the site's habitats withstand various environmental stress factors. *Coral Reef Resilience Assessment of the Bonaire National Marine Park, Netherlands Antilles* is available at <http://data.iucn.org/dbtw-wpd/edocs/2011-008.pdf>.

New European version of reserve science booklet

The Partnership for Interdisciplinary Studies of Coastal Oceans (PISCO), a collaboration of four US universities, has released the latest booklet in its series on the science of no-take marine reserves. The new booklet summarizes current peer-reviewed knowledge and focuses in particular on Europe, with several case studies from European MPAs.

PISCO published its first "Science of Marine Reserves" booklet in 2002, and updated it in 2007 with US and international versions. It also produced a Latin & Caribbean version in 2008. The series is available at www.piscoweb.org/publications/outreach-materials/science-of-marine-reserves.

Reducing collisions between ships, whales in MPA

A new report by the US Office of National Marine Sanctuaries analyzes the threat of ship strikes on whales in the Channel Islands National Marine Sanctuary off the coast of California, and suggests options for reducing their likelihood. The report is in response to the events of December 2007, when four blue whale carcasses were discovered near or within the sanctuary. Based on necropsies, the four were determined to have all died directly from ship collisions; one was pregnant with a near-term calf. Prior to that, the maximum number of blue whale documented fatalities in a single year in the region had been three.

The report suggests several options for reducing the threat of ship strikes, including narrowing or moving the shipping lane that cuts through the sanctuary, or slowing ship speed. It also recommends a series of research and education measures, and consideration of voluntary, mandatory, and incentive-based policies to reduce risk. Some 6500 large vessels transit past the Channel Islands every year, the majority of them at speeds greater than 14 knots, according to sanctuary

management. The archipelago provides critical feeding grounds for the largest stock of blue whales in the world as well as other endangered cetacean species. The report is at http://sanctuaries.noaa.gov/science/conservation/pdfs/ship_strikes.pdf.

Survey seeks insights on mobile apps for MPAs

How can mobile devices and the software applications ("apps") that run on them be used for the benefit of MPAs and the marine community? A new survey aims to find out. A collaboration between the World Commission on Protected Areas - Marine and the University of Exeter (UK), the survey is part of a project to gauge the current state of mobile technology with regard to MPAs, promote existing solutions, and investigate new opportunities. Mobile apps, for example, could allow users to access information on MPAs or upload field data from sites they visit, according to the project leads. Apps could also focus on MPA-related education or entertainment. The survey is at www.surveymonkey.com/s/8PPJM9B.

Major supermarket chain voices support for MPAs

Safeway, the second-largest supermarket chain in North America, has expressed its support for marine protected areas in general and MPAs in California and Antarctica in particular. In an April 2011 statement on the company's website, Safeway announced:

"An important part of being a responsible seafood business is to not only limit the impacts of where we are fishing, but to set aside areas where we are not. Marine Protected Areas (MPAs) are important to ensure the biodiversity and productivity of our oceans. In California, Safeway is a proponent of the Marine Life Protection Act Initiative (MLPA), which balances the use and conservation of living marine resources through a statewide network of MPAs. Additionally, we are helping to preserve one of the last pristine marine areas on Earth: Antarctica's Ross Sea. Safeway has pledged to not buy or sell toothfish (Chilean Sea Bass) harvested from the Ross Sea and encourages Conservation of Antarctic Marine Living Resources (CCAMLR) member countries to designate the entire Ross Sea as an MPA."

Safeway's statement is at www.safeway.com/ifl/grocery/CSR-Food-Sustainability. In response to the supermarket chain's support for the California MLPA initiative, the Recreational Fishing Alliance (www.joinrfa.org), a national political action organization, called on its members to boycott Safeway.

Elsewhere in retailing: on 11 May, British high-end department store Selfridges launched Project Ocean, a campaign that raises funds for designating no-take marine reserves: www.selfridges.com/projectocean.