

MPA Enforcement: How Practitioners Are Developing New Tools, Strategies, and Partnerships

Managing a marine protected area means managing people. If people do not comply with the regulations in place to protect an MPA's resources, the MPA will most likely fail to meet its goals. Education can play a major role in encouraging compliance, both by building community support for conservation and by informing the public about the penalties for noncompliance. But in cases where education is not enough, enforcement becomes necessary.

Enforcement — including surveillance and policing — can take many forms, depending on the budget and expertise available to MPA management and the geographic characteristics of the MPA. In November 2000, *MPA News* reported on the mix of high-tech and community-based strategies practitioners were employing at the time (*MPA News* 2:5). This month, we examine how managers and partners are continuing to develop new tools and strategies to make sure that MPA regulations are followed.

Enforcement of vast, remote protected areas

A major development in the global MPA field in recent years has been the designation of several very large no-take MPAs, such as the 362,000-km² Papahānaumokuākea Marine National Monument in the US and the 408,000-km² Phoenix Islands Protected Area in Kiribati. While these vast closures represent an advance for conservation, they present big challenges for enforcement. Keeping a lookout for offenders in these wide expanses can be like searching for needles in a large, far-away haystack.

Technology and partnerships can be key to making enforcement work in such places. Take Operation Kurukuru, for example. Operation Kurukuru is a massive, international enforcement operation in the Western Pacific to detect illegal, unregulated, and unreported (IUU) fishing, as well as smuggling and people trafficking. In 2009 over a span of 10 days, the operation:

- Covered an area of approximately 10 million km², including the Exclusive Economic Zones of the Cook Islands, Kiribati, Niue, Samoa, Solomon Islands, Tokelau, Tonga, Tuvalu, and Vanuatu;

- Included fisheries surveillance and enforcement staff from each of the above countries, as well as their counterparts from Australia, New Zealand, France, and the US;
- Involved 7 Pacific Class patrol boats (from Cook Islands, Samoa, Solomon Islands, Tonga, Tuvalu, Kiribati and Vanuatu) and 1 French patrol boat; and
- Was supported by aerial surveillance provided by 4 maritime patrol aircraft (from Australia, New Zealand, France, and the US).

Each country had access to a web-based map of surveillance flights, licensed vessels, and unlicensed vessels. The big prize of the 2009 operation was the arrest of a vessel fishing without a license in Kiribati waters: the Kiribati government fined the vessel owner and master a total of US \$1 million. (The illegal fishing did not occur in a designated protected area; if it had, the penalties would have been even greater. Several MPAs, including the Phoenix Islands Protected Area, were included in Operation Kurukuru's surveillance area.)

Martin Campbell of the Pacific Islands Forum Fisheries Agency, based in the Solomon Islands, coordinated the 2009 operation. "The aim is to produce an accurate and continually updated surveillance picture of the region," says Campbell. "This allows surveillance assets (both ships and aircraft) to be deployed effectively to target foreign fishing vessels that are considered to have a high risk of conducting IUU." There are several criteria involved in deciding whether a vessel poses such a risk, he says: its geographic position, its movement relative to EEZs where the vessel is not licensed to fish, and information from boarding and inspection reports, which provide a history of the vessel, company, and master's past compliance.

Spreading the word about these enforcement efforts plays an important role in compliance, says Campbell. "It acts as a deterrent to vessels considering breaching the laws and regulations," he says. "We take every opportunity, especially through the media, to sing the praises of the Regional Fisheries Surveillance Centre and successes like Kurukuru and the prosecutions of vessels."

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Aircraft and patrol vessels, as used in Kurukuru, clearly can be very effective in enforcement. But they may represent only a portion of the technological tools available to future surveillance of large MPAs, according to Jeff Ardron. He and Sandra Brooke, both of the Marine Conservation Biology Institute (MCBI) in the US, coordinate the Surveillance and Enforcement of Remote Maritime Areas project, or SERMA. In November 2009, SERMA convened an international group of resource managers, law enforcement personnel, and other experts to brainstorm solutions to enforcement challenges of large offshore MPAs.

“There are many different types of tools that could potentially be used for surveillance of large or remote areas,” Ardron says. “These include such platforms as traditional aircraft and patrol vessels and well as unmanned air and surface craft, autonomous underwater vehicles, tethered and untethered inflatable balloons, and various types of buoys and satellites. These platforms can support any of a vast array of instrument packages such as different types of vessel monitoring systems, imaging technologies, and acoustic hydrophones. All of these have strengths and weaknesses and vary greatly in purchase and operating costs as well as ease of use. However, it is already clear that combining conventional tools with new and emerging approaches allows for a more targeted use of limited patrol resources.”

The SERMA workshop produced a list of recommendations, including on integrating remote MPA surveillance into national marine security, intelligence, and surveillance systems. “Cooperative integrated measures share costs and reduce redundancy,” state the SERMA recommendations.

Nonetheless, adds Brooke, it is not about simply handing over MPA enforcement to the military. “There are certainly advantages to having the military responsible for surveillance of these areas: they have powerful technologies and many more assets than civilian agencies,” she says. “However, there would also be disadvantages to placing full responsibility on the military. They have other priorities that would take precedence over resource regulations. In addition, the military often do not have the jurisdiction, training, or mandate to enforce these types of regulations, although this varies from place to place. The best of both worlds would be a cooperative arrangement whereby the military would use its tools and assets for surveillance, which would inform and guide enforcement activities by the appropriate civilian agencies.”

As part of the SERMA project, MCBI will soon release a report on technical options for surveillance. It is also planning a complementary report on enforcement strategies, involving the integration of new and emerging technologies into existing legal structures.

Private aid for enforcement

Marine protected areas worldwide suffer from chronic funding shortages. This affects enforcement programs. Some MPAs have partnered with private NGOs or foundations to secure funding for their enforcement efforts. But the support is often limited to the purchase of a patrol boat, or construction of a guard station, or capacity-building for staff. In the Galápagos Marine Reserve, a broad enforcement partnership has been established between management and the Sea Shepherd Conservation Society.

Sea Shepherd — which is well-known (or notorious) for its direct-action efforts against illegal whalers, in some cases ramming the whaling vessels with its own ships — has been involved in the Galápagos for nearly a decade (*MPA News* 3:4). Industrial fishing in the 140,000-km² marine reserve is banned by Ecuadorian law, but poaching has been widespread. In 1997, Sea Shepherd offered the use of its 29-meter patrol vessel *Sirenian* to the park and the Ecuadorian government. In 2001, the NGO and the Galápagos National Park Service agreed to partner. (The Park Service manages the reserve.)

“Our role is providing financial and logistical support to the Ecuadorian law enforcement agencies,” says Alex Cornelissen, who leads Sea Shepherd’s Galápagos programs. The support takes several forms:

- **Vessels:** Sea Shepherd loaned the *Sirenian* to the Park Service for the first five years of partnership, then donated the vessel to the Park Service. The NGO is now organizing the donation of another small vessel to the park’s fleet;
- **Hiring of personnel:** The NGO has hired two crew members for the Park Service’s floating base station Tiburón Martillo. (“Even though we are paying their salaries, they work for the Park,” says Cornelissen.) The station is located in the north of the reserve in an area of historically high poaching. Sea Shepherd has also hired an Ecuadorian attorney to examine strategies for strengthening punishment of environmental offenders in Galápagos;
- **Police dogs:** In 2008, Sea Shepherd purchased six trained police dogs from Colombia to help the Ecuadorian environmental police establish a K-9 unit that focuses on detection of illegal wildlife parts. The main goal is to target the smuggling of shark fins from Galápagos to the mainland;
- **Radios:** Sea Shepherd just completed implementation of new radio systems for the police and the agricultural control service. “We have donated and installed complete VHF and UHF radio networks for the entire archipelago that enable these institutions to perform their work in a safer and more efficient manner,” says Cornelissen.

“There are many types of tools that could be used for surveillance of large or remote areas. These include traditional aircraft and patrol vessels as well as unmanned air and surface craft, autonomous underwater vehicles, tethered and untethered inflatable balloons, and various types of buoys and satellites....”

- Jeff Ardron
SERMA project

These programs have all required substantial funding, of course. Sea Shepherd has donors around the world. The Dutch National Lottery, for example, provides 500,000 euros (US \$688,000) each year to Sea Shepherd as a whole, and this year donated an additional 1 million euros (\$1.38 million) to fund establishment of an automatic identification system (AIS) for vessels in the Galápagos Marine Reserve. The AIS will enable Galápagos authorities to monitor vessels more closely and act instantly in cases of illegal activity. (For information on how AIS works, go to www.navcen.uscg.gov/enav/AIS/default.htm.)

“We are doing our best to provide the most powerful tools to the local authorities in order for them to improve their efficiency and results,” says Cornelissen. But the partnership stops short of Sea Shepherd actually patrolling and making arrests. “These are Ecuadorian waters and only Ecuadorian authorities are entitled to

uphold the regulations,” he says. “On the water, the only authority remains the navy, and on land these are matters for the Ecuadorian police.”

Advice on building, managing ranger stations

In Belize, an NGO called the Toledo Institute for Development and Environment (TIDE) was founded in 1997 to meet the growing environmental and development needs of the Toledo District (www.tidebelize.org). Among its programs, TIDE assists the Belizean government in planning and managing protected areas, including co-managing the Port Honduras Marine Reserve and the Paynes Creek National Park. TIDE also manages more than 20,000 acres of private protected lands. The organization has built a ranger station in each protected area to enforce regulations. Celia Mahung, executive director of TIDE, was asked for advice on planning and managing such facilities.

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Managing a changing set of enforcement challenges: Tubbataha Reefs Natural Park, Philippines


In December 2007, *MPA News* spoke with Angelique Songco, manager of the Tubbataha Reefs Natural Park in the Philippines, about enforcement challenges her offshore MPA faced (*MPA News* 9:6). A Chinese fishing vessel had been caught poaching hundreds of live fish in the no-take MPA one year before. Songco spoke of the delays in prosecution of the case, leading to the Chinese crew members becoming part of Palawan society while they awaited trial.

Recently we checked back with her to see how the prosecution — and enforcement in general in Tubbataha — were going:

- **MPA News:** Two years ago we discussed the Chinese vessel *Hoi Wan* that was caught fishing illegally in Tubbataha. Has the trial started yet?
- **Angelique Songco:** In a lower court, the accused pled guilty and were fined, and the boat was forfeited in favor of the government. But the counsel for the accused protested the forfeiture, which means the case continues to creep through our legal system and may take another year to finally reach a resolution.
- **MPA News:** Have enforcement challenges at Tubbataha changed over time?
- **Songco:** The entry of foreign poachers in the park — such as in the *Hoi Wan* case — is not a common occurrence. We are more challenged by incidents of topshell gathering by fishers from mainland Palawan. [Topshell is a marine snail (*Trochus niloticus*).] This is a recent development that began in 2006. We have found that the population of topshells in the park has decreased by almost 80% since then. These fishers harvest shells at night, making detection tricky. We have informants in the fishing villages, and we have made arrests based on their reports. Our information and education activities target fishing villages and schools in the known localities of illegal fishers. Through a grant from Jaeger-LeCoultre (a Swiss luxury watchmaker) and the intervention of the UNESCO World Heritage Centre, we purchased a more efficient radar system last year to replace the 12-year old model we had. The new system can detect most of the topshell poachers' boats. [Editor's note: there is a guard station in the park.] There was a decrease in topshell collection in 2009 but a few fishers continue to take the risk of incarceration.

• **MPA News:** Compliance and enforcement are related: the more compliance there is, the less need there is for enforcement. What strategies does Tubbataha use to encourage compliance?

• **Songco:** The downside to being an offshore MPA is that we are unable to provide adequate opportunity for people to appreciate its values firsthand. It is a challenge to bring people to the park, due to distance [it is 81 km from shore] and its seasonal restrictions on access. Instead, we endeavor to bring the park to schools and villages through photos and slide presentations. Regulations are well-publicized. The laws that apply to the park and their value are explained in the fishing communities.

As an offshore MPA, there is no specific community that has “ownership” of Tubbataha. Our audience is so wide and varied that it is challenging and costly to inspire support for conservation. We continue to strengthen information and education activities, upgrade enforcement equipment, and train personnel to meet the challenges inherent in an offshore MPA. 

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“Ranger stations should be sited in a location that is central to the area under management,” says Mahung. Her organization’s Port Honduras Marine Reserve is multiple-use with no-take zones, and the ranger station is located on a small island (Abalone Caye) near the no-take zones. “This saves costs on fuel for patrols,” says Mahung.


A station on an island presents unique challenges that must be considered in planning, she notes. Moving construction materials and workers to the site is an increased cost compared to a land-based station. Maintenance of a station exposed to the weather on a small caye also includes costs of planning a trip to town by boat to pick up needed materials and a worker, then returning the worker to town afterward.

“The station must be designed and built with prevailing weather conditions in mind to result in a durable and sturdy building,” says Mahung. “The use of low-energy and alternative sources of energy including solar and wind is an advantage although staff should be trained in basic maintenance activities. A composting toilet is an asset to any station.” She says TIDE is always reviewing current conditions and resources for opportunities to make its stations more effective.

Mahung emphasizes the need for well-trained rangers to operate the stations. “TIDE is proud of its dedicated

staff,” she says. The rangers work on a two-weeks-on/one-week-off schedule and live at the ranger station during the two weeks of work. “With this as the situation, the station must be seen not only as the center of management for the reserve but also as a home with a suitable kitchen and comfortable sleeping areas,” she says.

TIDE has hired women as park rangers, and they perform the same duties as males. Some challenges have been encountered as staffers confront traditional stereotypes of male and female roles. “We have learned that the day-to-day interaction creates dynamics that require additional training in human relations skills and sensitivity to overcome stereotypes,” says Mahung.

TIDE views education in general as critical to the success of enforcing the MPA’s regulations. The organization offers an abundance of public environmental education programs (www.tidebelize.org/education_outreach.html), and also views each ranger as a frontline educator. “Compliance is improved as people accept the concept [of conservation] and develop stewardship for the protected areas,” says Mahung. “TIDE utilizes a system that relies on information sharing and warnings. To be stopped by a TIDE ranger on patrol is to receive information and education on the protected area and the importance of compliance with regulations.” 

Letter to the editor: Reserve effects

Dear MPA News,

I am writing in response to your article “The Reserve Effect on Fisheries: In Light of Recent Studies, Should It Be Considered Settled Science?” (*MPA News* 11:4).

MPA scientists should not get too set with classifying spillover as settled science. In the waters off East Central Florida, I have been fishing just west of a 96-square mile area called the Oculina Bank Habitat Area of Particular Concern since it was closed to reef fishing in 1994 (www.safmc.net/Portals/0/Oculina/OculinaRackCard.pdf). To date, the fishing is not as good in the open area as it used to be prior to the closure, despite all the promises of spillover. This is primarily for two reasons. First is that fishery managers closed the bank but posted too few guards to enforce the closure. Second is there are just as many, and perhaps more, anglers who now concentrate their efforts in the adjacent area. While my observations are anecdotal, they are supported by my fellow anglers who also fish the open area. We have seen no spillover.

Ron Rincones

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Journal issue examines reserve science

A special issue of the journal *Proceedings of the National Academy of Sciences* (PNAS) published in February 2010 is dedicated to recent science on no-take marine reserves, with a focus on how reserves can help meet conservation and fisheries goals simultaneously.

“There is plenty of new evidence to show that if reserves are designed well, they can benefit both fish and fishermen,” said Steve Gaines of the University of California Santa Barbara (UCSB), a guest editor of the PNAS special issue. One article in the issue examines sources and sinks for fish larvae and suggests that, if fishing is prevented in source areas and instead concentrated in sink areas, fisheries could realize a significant gain in value — greater than 10% according to model simulations.

The issue’s articles are downloadable for free. Go to www.pnas.org, click on “Early Edition”, then scroll down to articles on marine reserves that were posted on February 24 and February 22.

Chagos: Background on a Disputed Archipelago and Efforts to Designate its Waters as a Reserve

When the UK government launched a public consultation in November 2009 on whether it should designate an MPA around the Chagos Archipelago in the Indian Ocean (also called the British Indian Ocean Territory), it reignited a decades-old controversy on the rights of islanders who used to live there. Expelled by the UK government in the 1960s to make room for a joint UK-US military base, Chagossian refugees have campaigned for the right to return. The resettlement issue has wended its way through the UK court system and Parliament, and might go next to the European Court of Human Rights.

The UK government consultation (www.fco.gov.uk/resources/en/pdf/21153320/mpa-consultation-101109) closed on 5 March 2010. Reactions to it raised questions of whether the UK would be morally right to close off Chagos waters unilaterally. The refugees may return some day, for instance, and need to fish for food or income generation. Advocates for the refugees have pointed out that any no-take protections put in place now without Chagossian consultation could be overturned by refugees if, or when, they return to the archipelago.

In the field of MPA planning, Chagos is an unusual case. The archipelago has no current residents (save for roughly 4000 military personnel and contractors, mostly Americans) and yet the MPA-planning process has had as high an international profile as any in recent years, with advocates strongly for and against no-take status:

- An online petition distributed by an international group of conservation organizations — the Chagos

The Chagos ecosystem

- The Chagos archipelago is a group of seven atolls comprising more than 60 tropical islands but covering just 63 km² of land. It is 500 km south of the Maldives in the Indian Ocean.
- Chagos coral reefs host 220 species of coral and 784 species of fish. IUCN says the islands' extremely low direct impacts of human activities have created "unrivaled ecosystem health" and that its reefs are "the healthiest, most resilient coral reefs in the world."
- The archipelago's waters also contain sandy lagoonal habitats, seagrass habitat, mangroves, seamounts, deep-sea canyons, and hydrothermally active areas.
- Fisheries for skipjack and yellowfin tuna are active for two months of the year in Chagos waters.

Environment Network (<http://protectchagos.org>) — collected more than 275,000 names in favor of applying no-take status to the archipelago's entire 636,600-km² Exclusive Economic Zone and territorial waters.

- A competing online petition distributed by the Marine Education Trust, an NGO, proposed that any UK consideration of MPA status should allow for multiple use, and should also discuss resettlement of Chagossians and transfer of the archipelago's sovereignty to Mauritius. It collected more than 1500 signatures (www.marineeducationtrust.org/petition/protect-chagos).

- The government of Mauritius, where many of the expelled Chagossians settled in the 1960s, has called it "unacceptable that the British claim to protect marine fauna and flora when they insist on denying Chagos-born Mauritians the right to return to their islands all the while." (<http://bit.ly/9GFPO3>)

- IUCN submitted a letter to the UK government in support of full no-take status for Chagos waters, while "stressing the need for meaningful involvement of all relevant stakeholders in defining the outcome of the consultation." (<http://bit.ly/9AYwvQ>) The IUCN letter was criticized by the Mauritian government and by some members of IUCN's own Commission on Environmental Law, who called it "unethical" (<http://bit.ly/93L5Lk>).

Now that the public consultation period is over, the UK government must decide what to do. In its consultation, the three options it gave were: (a) designate the entire Chagos marine area as no-take; (b) designate it as no-take but allow exceptions for certain pelagic fisheries, such as tuna; or (c) declare no-take protections for the inshore reef systems only. Which one the government will ultimately choose — if any of them — remains to be seen. 🌊

Chagos timeline

1700s: The uninhabited archipelago is claimed by France, which establishes coconut plantations there and sends workers from Mauritius to work on them.

1814: Chagos is ceded to Great Britain by treaty upon the defeat of Napoleon. Plantations failed by the mid-1900s but some of the workers remained.

1967-1971: UK expels remaining population of 2000 Chagossians to make way for a joint US-UK military base on the island of Diego Garcia. Chagossians resettle in Mauritius and UK.

2000s: UK courts rule the expulsion of residents was unlawful and that Chagossians have the right to return home.

2008: The UK House of Lords rules that the UK government does not have to allow Chagossians to return.

2009: UK Foreign and Commonwealth Office opens public consultation on whether Chagos waters should be designated an MPA. The consultation closed on 5 March 2010.

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Notes & News**Pacific Island leaders to close 4.5 million km² of high seas to tuna vessels**

In February, Parties to the Nauru Agreement — under which management of Central and Western Pacific fisheries is coordinated, including on the high seas — released a joint declaration on the future direction of the region's tuna fishery. Among other measures, the declaration calls for the closure of 4.56 million km² of high seas to purse seine vessels. In size, the closures will total more than eight times the land area of France.

The reasons for the closures and other measures are conservation and economic profit, says Transform Aqorau, director of the Parties to the Nauru Agreement. "Closing these areas will give tuna stocks a chance to recover from fishing and will also limit fishing effort so that it stays within sustainable limits," says Aqorau. "It also means the Parties to the Nauru Agreement can charge more for access to their Exclusive Economic Zones through the Vessel Day Scheme, in which fishing days are traded and sold to the highest bidder." Roughly 25% of the global tuna catch is caught in waters under the Nauru Agreement.

The closures are expected to take effect in 2011. They will add to 1.2 million km² of closed areas that took effect under the Nauru Agreement in January 2010 (*MPA News* 11:1). Parties to the Nauru Agreement are the Federated States of Micronesia, Kiribati, Marshall Islands, Nauru, Palau, Papua New Guinea, the Solomon Islands, and Tuvalu.

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Peru designates marine reserve

In late December, the Peruvian Government designated the country's second marine reserve — Guano Islands and Capes National Reserve (Reserva Nacional Sistema de Islas, Islotes y Puntas Guaneras). The goal of the reserve is to protect a representative sample of marine and coastal ecosystems associated with the Humboldt marine current, including mating and breeding grounds for birds and fur seals, and spawning areas for fish and invertebrates. The export of guano from seabirds in the region was historically one of Peru's largest industries.

The new protected area covers 1408 km² and includes 22 islands and islets, 11 capes, and adjacent marine waters. For more information (in Spanish) on the reserve as a whole and each one of the islands and capes, go to www.sernanp.gob.pe.

Baltic Sea meets CBD 10% target for MPAs

The Helsinki Commission (HELCOM), the international body that coordinates protection of the Baltic Sea environment, has announced that over 12% of the Baltic is now in MPAs. HELCOM officials said this means the goal set by the UN Convention on Biological Diversity of protecting 10% of each marine ecological region in the world by 2012 has been met for the Baltic Sea. MPAs covered in the assessment include Baltic Sea Protected Areas designated under the Helsinki Convention and marine areas protected by the EU Natura2000 network.

HELCOM notes, however, that the quality of the network is still inadequate due to various pressures including eutrophication, ship traffic, and pollution. And although the overall goal of 10% has been reached for the sea as a whole, the goal has not been met for all sub-basins of the Baltic nor for all countries.

There are 10 contracting parties to the Helsinki Convention: Denmark, Estonia, Finland, Germany, Latvia, Lithuania, Poland, Russia, and Sweden, as well as the European Community. The HELCOM announcement on passing the 10% target is at www.helcom.fi/press_office/news_helcom/en_GB/HABITAT_Meeting_12.

Bermuda to push for designating Sargasso Sea as MPA

The government of Bermuda is initiating an international effort to protect the Sargasso Sea. According to Deputy Premier Paula Cox, the government is conducting a feasibility study on how it could partner with other governments and scientific agencies to designate an MPA, most of which would be on the high seas, outside any nation's jurisdiction. Protections would therefore require multi-lateral agreements, either within or independent of the United Nations.

The Sargasso Sea is a dynamic gyre in the middle of the North Atlantic Ocean and is noted for its globally unique concentration of floating *sargassum* seaweed, which serves as a nursery area for many species. The Sargasso is roughly 1,100 km wide and 3,200 km long. Bermuda is on its western edge and is the sea's only land mass.

"The health of Bermuda's marine ecosystem is entirely dependent on the health of the wider ocean that surrounds us," said Cox. One of the main challenges facing the Sargasso is a high concentration of non-biodegradable plastic waste and other pollution that accumulates due to the sea's circulation pattern, according to researchers.

High seas closures now viewable in animated Google Earth map

Researchers at the Institute for Marine Resources & Ecosystem Studies (IMARES) in The Netherlands have created an animated map in Google Earth to illustrate high seas areas that are now closed to bottom fishing. The areas, closed by Regional Fisheries Management Organizations (RFMOs), are intended to protect vulnerable marine ecosystems such as cold water corals and sponges. The animated map allows viewers to zoom in on closures and access information on each one. To download the map, go to www.highseasmpas.org. (To view the map, you will need to have Google Earth installed on your computer. It is downloadable for free at <http://earth.google.com>.)

US, France sign agreement on Pacific MPAs

In November 2009, the US Office of National Marine Sanctuaries and France's MPA agency (Agence des Aires Marine Protégées) launched a program to share experience and expertise among their respective MPAs in the Pacific. The US MPAs to be involved in the exchange will include Papahānaumokuākea Marine National Monument, Fagatele Bay National Marine Sanctuary, and Hawaiian Humpback Whale National Marine Sanctuary. Staff from these sites will learn about traditional culture and management methods in French Polynesia, and staff from Polynesian MPAs will visit the US sites in return. The US and French agencies expect to expand the partnership eventually to MPAs in the Caribbean region. For more information, go to <http://oceanservice.noaa.gov/news/weeklynews/dec09/franceagreement.html>.

Ticket sales from Disney movie will go toward MPA-related program

A portion of each ticket sold for Disney's movie *OCEANS* in its opening week will go to support marine conservation in The Bahamas. The nature film, which uses new underwater filmmaking technologies to explore the world's seas, will debut on 22 April 2010 in the US and Canada.

Disney will donate US \$0.20 per ticket to the Adopt a Coral Reef program operated by The Nature Conservancy, with a minimum of US \$100,000 pledged to the program. The Adopt a Coral Reef program conducts research to identify biologically significant areas in Bahamian waters, in support of the establishment of a national network of MPAs. The Bahamian government has embraced the goals of the Caribbean Challenge (<http://bit.ly/aNujNB>), which calls on Caribbean nations to protect 20% of their marine and coastal habitats by the year 2020. More information on the *OCEANS* film is at <http://disney.go.com/disneynature/oceans>.

Publication available on protected areas in Latin America

A new report examines the status of protected areas in Latin America and their role in the region's sustainable development. It includes a chapter on MPAs as well as sections on World Heritage Sites and relationships between indigenous territories and protected areas. Much of the publication analyzes outcomes of the Second Latin American Congress on National Parks and Other Protected Areas, held in Bariloche, Argentina, in 2007. Based on that analysis, it also presents perspectives for the upcoming decade.

The report was co-produced by the IUCN Colombian Committee, National Parks Colombia, and Fundación Natura Colombia. *Protected Areas and Development in Latin America: From Santa Marta 1997 to Bariloche 2007 and Perspectives for a New Decade* is available at <http://data.iucn.org/dbtw-wpd/edocs/2009-046.pdf>.

IUCN report: Protected areas help people cope with climate change

A new report from IUCN documents the role of protected areas in mitigating and adapting to climate change. It features a section on coastal and marine protected areas in particular, including their use in sequestering carbon dioxide. It also describes how climate change considerations can be factored into protected area design, management, and governance.

"[Protected areas] are helping society cope with climate change impacts by maintaining essential services upon which people depend," states the report. "Without them, the challenges would be even greater, and their strengthening will yield one of the most powerful natural solutions to the climate crisis." The report *Natural Solutions: Protected Areas Helping People Cope with Climate Change* is available at http://cmsdata.iucn.org/downloads/natural_solutions.pdf.

Report available on economics of MPAs

A study commissioned by the Conservation Council of Western Australia (an NGO) concludes that marine reserves in Australia's southwest region could generate AU \$55 million (US \$50 million) per year in tourism and could also boost commercial fish stocks. The study is reportedly the first of its kind in Australia, comparing the economic benefits of establishing marine reserves to potential losses by commercial fishers who are denied access to the areas. The government of Australia is currently in the planning and early implementation stages of developing a representative system of MPAs in Commonwealth waters by 2012. As part of the strategy, the government is developing bioregional plans for each of Australia's five marine regions, including the southwest. The report *The Economics of Marine*

Online training program available on reef resilience

A virtual training program is available on how to build resilience to climate change into coral reef MPAs. Created by The Nature Conservancy in partnership with the US National Oceanic and Atmospheric Administration (NOAA), the free online course includes an introduction to coral bleaching, a description of the main principles of resilience, and recommendations on how to design and manage resilient coral reef MPAs. To enroll, go to www.conservationtraining.org and click on "Reef Resilience (Self-paced)".

Science spotlight:

Global study shows MPAs help to stop coral loss

A global analysis of more than 8000 coral cover surveys from 1969-2006 has compared annual changes in coral cover inside MPAs to unprotected areas. The study, published in the journal *PLoS ONE*, found that marine protected areas halted the loss of coral cover over time while coral cover on unprotected reefs continued to decline. In the most recent complete year in the study (2004-2005), for example, coral cover within MPAs increased 0.05% in the Caribbean and 0.08% in the Pacific and Indian Oceans. In contrast, unprotected reefs in that same year declined 0.27% in the Caribbean and 0.41% in the Indo-Pacific.

The loss of coral cover does not immediately reverse upon MPA designation, perhaps due in part to the slow growth rates of many reef-building species, according to the study's authors. "The benefits of MPAs appear to increase with the number of years since MPA establishment," wrote Elizabeth Selig, currently of Conservation International, and John Bruno of the University of North Carolina (US).

There were regional differences in the time it took to see a benefit from MPAs to coral cover. In the Caribbean, coral cover continued to decline (albeit more slowly) for approximately 14 years on average after protection began; then it stopped declining and began increasing. In the Indo-Pacific, coral cover in MPAs continued to decline for five years on average before rebounding.

Selig speculates the regional differences may have to do with differences in fishing pressure and other local factors. "High-level exploitation of fisheries and the loss of top predators has been well-documented in the Caribbean, so it may take more time there to restore the natural dynamics that could lead to indirect benefits to corals," she says.

Notably, the authors included MPAs in their study that still allow fishing or have poor enforcement of regulations. So the study's findings may represent an underestimate of the benefits that could come from well-enforced, no-take protection, they write. The article "A Global Analysis of the Effectiveness of Marine Protected Areas in Preventing Coral Loss" is downloadable for free at www.plosone.org/article/info:doi/10.1371/journal.pone.0009278.

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Survey: How should IUCN's protected area categories best be applied to MPAs?

An online survey seeks the views of MPA practitioners on how IUCN's protected area categories can best be applied to the marine environment. The six categories, which were designed for application in marine and terrestrial protected areas, range from "Strict Nature Reserve" to "Protected Area with Sustainable Use of Natural Resources". The survey is open through 12 April 2010, and can be accessed at www.surveymonkey.com/s/CBT7N86.

In 2008, IUCN developed new guidelines on applying the categories across all protected areas — terrestrial and marine (available at <http://data.iucn.org/dbtw-wpd/edocs/PAPS-016.pdf>). Findings from the current online survey will inform the drafting of an IUCN supplementary guidance document providing more detail on applying the categories specifically to MPAs.

Article reveals lessons from scientific program to rezone the Great Barrier Reef

An article in the journal *Ocean & Coastal Management* describes the science-based process used earlier this decade to guide the rezoning of the Great Barrier Reef Marine Park. Central to the process was the development of a set of biophysical operating principles that provided the basis for designing a network of no-take areas within the park. The 10 principles — which included protecting uniqueness, avoiding fragmentation, and protecting fewer, larger areas rather than more, smaller areas — are recommended by the paper's authors for application to MPA-planning processes elsewhere.

The article "A process to design a network of marine no-take areas: Lessons from the Great Barrier Reef" is available by subscription at <http://bit.ly/crHhk1>. However, the set of biophysical operating principles is available for free at <http://bit.ly/b0PayC>.

Underwater sculptor looking for people to cast

Sculptor Jason deCaires Taylor, who creates sculptures of human figures for underwater display in MPAs and was profiled in our September-October 2009 issue ("Applying the Arts to MPA Planning and Management", *MPA News* 11:2), is seeking people to cast as part of his latest installation. The installation will be submerged in the National Marine Park of Cancun, Isla Mujeres and Punta Nizuc in Mexico, and ultimately will involve 400 figures. If you are interested in being immortalized in the installation, apply by sending a photo of yourself to info@underwatersculpture.com. Applicants must be available to travel to Cancun. For more information, go to www.underwatersculpture.com.