

Monthly news, analysis, and guidance on marine protected areas worldwide

MPAs and ecosystem tipping points: What do managers need to know?

Scientists now recognize that ecosystems can sometimes undergo abrupt, dramatic changes in response to human use or environmental conditions. When a *tipping point* like this is crossed, we can witness upheaval in ecosystem structure and function and in ecosystem benefits to people. These tipping points can be hard to reverse due to feedbacks that reinforce the new state.

The crossing of such tipping points – and the shift to a new ecosystem state – has been observed in a wide range of marine habitats, from kelp forests, to coral reefs, to open ocean systems and more. This includes inside some MPAs. The northern section of the Great Barrier Reef Marine Park, for example, has experienced significant coral death as a result of high temperatures in 2016 and 2017. Different from coral bleaching, which results in white corals and can reverse in a few years, dead corals quickly [get covered with mats of non-symbiotic algae](#). The algae mats make it difficult for baby corals to re-establish. (A non-MPA example: in the early 1900s, overhunting of sea otters along the Pacific coast of North America caused a boom in sea urchins – the otters’ prey – which in turn led to destruction of kelp forests as abundant urchins overgrazed them.)

For MPA practitioners and other ecosystem managers, an understanding of tipping points is critical because they change the rules of the game. The new ecosystem state may function quite differently from the previous one, and respond differently to management interventions.

The Ocean Tipping Points collaborative research project, based at the University of California, Santa Barbara, seeks to understand and characterize tipping points in ocean ecosystems. [The project website](#) is a trove of information

on the subject, including how management can anticipate tipping points and what tools and resources are useful to avoid crossing them.

Carrie Kappel, principal investigator of the Ocean Tipping Points project, provides her thoughts here on what MPA managers need to know about this topic.

What MPA practitioners need to know about ocean tipping points

“MPAs, because they protect and rebuild biodiversity, have increased resilience and probably decreased the risk of tipping points. But they are not immune. Lots of the drivers of dramatic ocean change, including a warming climate, are happening rapidly and at large enough scales to threaten MPAs with crossing tipping points, too.”

On predicting or preventing the crossing of tipping points

“We have been working with ocean and coastal managers, including MPA managers, to try to develop tools that can help predict, prevent, or cope with such changes. The first step is working to understand and quantify the potential thresholds in your ecosystem – where a human or environmental driver has the potential to induce disproportionate changes in the system if it exceeds the threshold level. [Editor’s note: the terms *threshold* and *tipping point* are used interchangeably.] This can yield valuable reference points for monitoring and management. Then based on the potential risks and risk tolerance, one can establish a precautionary buffer around the undesirable tipping point and try to manage the driver to avoid reaching the threshold.

“It is important to recognize that tipping points may be operating at scales larger than your MPA. So try to account for that in monitoring and management. For example, if you are trying to measure the effectiveness of your MPA over time but during that same period the surrounding area shifts into an entirely different set of conditions, then detecting the MPA’s effect will be quite difficult. This is why it is so crucial we are investing in ecosystem monitoring and forecasting at multiple scales.

“Most of what we know about tipping points comes from looking back after they have already been crossed, which

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OCTO

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FOR THE OCEAN

Hi everybody,

This issue covers the months of July and August, allowing our staff a mid-year holiday. Best wishes for your work!



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will not help much if your system hasn't crossed a threshold yet. But looking to similar systems to learn by analogy can help. For example [Kendra Karr](#) and colleagues, and [Tim McClanahan](#) and his coauthors, have shown that the fraction of total unfished fish biomass remaining on a coral reef provides a good indicator of how close that reef might be to crossing a tipping point. This is a much better leading indicator than coral cover, which tends to respond only when it is essentially too late. They have shown that this has promise across Indian Ocean and Caribbean reefs so far."

On hope for recovery after tipping points are crossed

"There are numerous examples of coral reefs and kelp forests within MPAs that have rebounded after crossing a tipping point. MPAs can be critical in rebuilding sufficient populations of herbivores to control seaweeds on coral reefs or predators of urchins in kelp forests so that they can interrupt the feedback loops that impede recovery. This process may take a long time. Across different kinds of systems, the timeline of recovery tends to be on the order of decades."

On whether warming could involve a worldwide ocean tipping point

"There is still so much we don't know about how quickly marine species will be able to adapt or move to deal with our rapidly warming and acidifying oceans. But it is certain that there will be winners and losers and that many parts of the globe will become uninhabitable for their current suite of species. I am willing to bet that these dramatic ecological changes will have profound consequences for human communities that depend on the ocean for food, livelihoods, sociocultural practices, etc. We will not have to wait to see these kinds of changes, either. They are upon us. Species are already on the move, habitats are under stress, and people are losing access to the species on which they once depended." 

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To comment on this article:

<https://mpanews.openchannels.org/node/22821>

Editor's note:

This recurring column, MPA Training in a Nutshell, distills advice from what is likely the largest and longest-running MPA management capacity training program in the world – the [International MPA Capacity Building Team](#) (IMPACT). Run by the US National MPA Center (within NOAA's Office of National Marine Sanctuaries), the program has trained thousands of MPA managers in more than 40 countries. MPA News profiled IMPACT in our [July 2015 issue](#).

Anne Nelson co-leads IMPACT. In these columns, Anne is sharing quick and useful tips – best practices gathered by IMPACT from MPA managers worldwide.

MPA Training in a Nutshell: On building relationships with stakeholders

By Anne Nelson and the IMPACT team

Relationships built on trust between MPA management and stakeholders can strengthen community support for MPAs. By fostering such support, these relationships can help MPAs meet their management goals.

Ideally the relationships extend broadly through local communities, resource users, and MPA managers and related agencies. Building relationships early and consistently across these groups can be a relatively simple, productive, and positive experience. Here are useful strategies we've observed from managers:

- Build and expand the community's knowledge of why the MPA was established, its target resources, and its benefits. In effect you are telling the MPA's 'story'. This is a community effort: partner with schools, community organizations, and other groups that already actively share information with the community and resource users. They can amplify your message.
- Examine and understand how people seek out trusted information in your community. For example, is the best source of information for locals the post-fishing conversations at the dock? If so, consider how you can

share information through those conversations to build understanding of, support for, and participation in your MPA activities.

- Host a coffee session with informal discussions sharing the successes of your MPA activities over the last year. For example, this could feature monitoring results that are shared in a lively non-technical manner, and connected to particular interests of your community.
- Recognize that the relationship-building strategies that work best in each region may be unique to that region. Always look for ways to connect your MPA's story to the communication style and outlets of your community. 

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The MPAs of Central America (last of three articles): Lessons learned from the past 20 years

By Carlos A. Espinosa, Néstor J. Windevoxhel, and Juan C. Villagran

Protected areas in Central America showcase the region's magnificent landscape and tropical biodiversity – terrestrial and marine. They help maintain a sustainable supply of water, food, and other natural resources essential for all life in the region. And they provide Central America's inhabitants a way to protect their own economy, welfare, and future.

Sixty years have passed since the region's first coastal protected area, the Volcan Cosiguina National Park, was designated on the Gulf of Fonseca in Nicaragua. Over the past 20 years in particular, Central American governments and international supporters have designated many coastal and marine protected areas. Social awareness of the importance of these protected areas is growing, and the number of people prepared professionally to work for the conservation of these areas increases each year in the region.

However, despite these advances and [some examples of successful MPAs](#) in Central America, the efforts have not been enough to develop the management of many other areas nor maintain their conservation. [There remain many challenges](#), including even the spread of organized crime. So what are the lessons learned after years of effort, and how will these experiences help us focus better on meeting the challenges?

Lessons learned in financing and sustainability

Although progress has been made in all Central American countries to designate networks of marine protected areas, the MPAs usually do not have the necessary human and financial resources to be managed effectively. The national budgets for conserving these areas are much lower than those for terrestrial areas, which are often longer established and of greater public recognition. As a result, for the MPAs of Central America, there is substantial dependence on resources from external cooperation and international private donors related to marine conservation. At the same time, the FAO estimates that international cooperation for protected areas in Latin America [has decreased by about 50% in recent years](#).

Although new tools for financial sustainability have emerged in recent decades – payments for environmental services, trusts, compensation by the private sector – these mechanisms by themselves have not achieved full financing of protected areas. In fact these novel financial mechanisms have often led to further decreases in government investment, achieving an unintended negative effect.

To improve the financing of protected areas, a greater investment by the State to fulfill its social responsibilities will be necessary. This should include the involvement of diverse government sectors – military, agriculture/livestock, fisheries, urban development – in supporting protected areas and being mindful of their impact on the same. There will also need to be the active participation of civil society and the private sector through an inclusive governance system. With a few exceptions, initiatives to generate alternative livelihoods for communities with regard to protected areas have not achieved the results expected, due to factors like poor follow-up and weak markets for new products.

Lessons learned in governance and management

MPA governance in the region should involve greater participation of interest groups in management. Most protected areas in Central America encounter threats that originate outside them. Therefore it is impossible to achieve their conservation only with efforts made within their limits. It requires the engagement of MPA personnel in the surrounding communities.

In most Central American countries, the park directors and park guards have limited capacity to address environmental crimes or enforce the law with authority. The combination of a poor budget, limited interaction of park guards with users outside the protected area, and limited police backup results in inadequate enforcement capability. An important exception is Belize where the park rangers have police authority, are armed, are trained in legal matters, have the capacity to lead a police process, and can arrest offenders. The respect of Belizean citizens, and their resulting compliance with MPA regulations, is evident.

Although there are cases where progress has been made in the governance and management of these areas (like Belize, or Costa Rica), most areas in Central America do not have effective management. In addition, it has been difficult to find resources to increase the effectiveness and efficiency of enforcement and surveillance programs at sea.

Practices that are no longer recommended in the region

Relying principally on international financing for the management of MPAs is a practice that should not continue. Each project, initiative, or donation should seek that the national government contributes equal resources. If this

Editor's note:

The countries of Central America possess several decades of experience with coastal and marine protected areas. MPA News invited Carlos Espinosa, founder and director of [Dos Mares](#), to contribute insights on the past, present, and future of MPAs in Central America. Dos Mares promotes MPA sustainability in the region by disseminating marine science knowledge and conservation tools, and by fostering green business opportunities. Carlos is originally from Nicaragua, and worked for several international agencies in Central America, Mexico, Puerto Rico, and the United States before founding Dos Mares. The following is the third of three articles he has contributed. His first was [in our May 2018 issue](#). His second, with Néstor J. Windevoxhel as co-author, [was in June](#).

His co-authors on this third article – Néstor Windevoxhel again and Juan C. Villagran – both have extensive work experience with Central American protected areas and deep knowledge of the history, successes, challenges, and opportunities for biodiversity conservation in the region.

does not happen, most of the activities promoted will not be sustainable, and management of the areas will not improve in the long term.

The approach in which an MPA administrator defends the resources of the protected area against the rest of society is a strategy that has not allowed effective management of protected areas. Conservation efforts must be made not only within their limits but in their area of influence. This requires the involvement of protected area personnel in their surrounding communities.

Last, it is not advisable to continue to hire park guards without subjecting them to rigorous training. They must be able to enforce the law, represent themselves as a true authority, and increase their capacity for leadership, community

development, and conflict resolution. They should also have a better salary according to their abilities. 

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Editor's note:

The 2020 deadline looms for achieving 10% global MPA coverage – the goal under both [Aichi Target 11](#) of the Convention on Biological Diversity and the UN's [SDG target 14.5](#). As the 2020 deadline gets closer, the consideration of what counts as an MPA is gaining greater importance. Whether the world meets the 10% target may depend on it.

To provide guidance on what is an MPA, IUCN [released a set of consolidated standards in June 2018](#). The following article is a reprint of [one published in June](#) with insights on the IUCN standards from Mike Wong, IUCN World Commission on Protected Areas vice chair for the North American region. The article has been edited lightly by MPA News for style and length.

IUCN moves to help countries apply marine protection

By clarifying its standards, global body hopes to inspire more ocean safeguards

By Angelo O'Connor Villagomez, Pew Bertarelli Ocean Legacy Project senior officer

As more countries designate MPAs in their territories, the International Union for Conservation of Nature (IUCN), which for over 70 years has been the global authority on the status of the natural world and the measures needed to conserve it, has recently provided clarity to help countries more accurately report their MPAs to the [World Database on Protected Areas](#) (WDPA).

With more accuracy, governments, nongovernmental organizations, and other stakeholders can properly track progress toward global targets, such as the UN Convention on Biological Diversity's Aichi Target 11, which calls for protecting 10% of the ocean by 2020, and the IUCN recommendation of safeguarding at least 30% of the ocean by 2030.

To learn more about the IUCN MPA standards, I caught up with Mike Wong, the IUCN World Commission on Protected Areas' vice chair for the North American region.

Q: How does IUCN define an MPA?

Mike Wong: In place for over a decade now, the IUCN definition for a protected area is “a clearly defined geographical space, recognized, dedicated and managed, through legal or other effective means, to achieve the long-term conservation of nature with associated ecosystem services and cultural values.” This states that the primary goal of any protected area, including MPAs, must be conservation of biodiversity. In practice, however, the term MPA is being used to describe many forms of management applied to a defined marine area, ranging from no-take areas to those

that permit industrial levels of extractive activities. Only those marine areas that have a primary conservation objective should be described as MPAs.

How much of the ocean is protected?

Wong: Interesting question. According to UN Environment's [World Database on Protected Areas](#), MPAs cover 7.26% of the ocean as of May 2018. That's based on the best data we have, which is submitted by governments. Just collecting all the data is a monumental task, as there are over 15,000 MPAs designated around the world. Yet, recent reviews, including a 2018 peer-reviewed study [published in Marine Policy](#), have found that areas that may not meet the IUCN standard of an MPA are also included in the database.

Using a slightly different method of gathering data, the [Marine Conservation Institute's Atlas of Marine Protection](#) also estimates how much of the ocean is actively protected. The institute uses WDPA data as a starting point but compares it to national databases and other sources of regional, national, and local information to determine if areas are truly protected. The atlas estimates that about 3.7% of the ocean is actively protected as of May 2018.

How is IUCN working to address that discrepancy?

Wong: This discrepancy is not new, and there has been much discussion in the conservation community on what should actually count as protected. This is similar to the "paper park" discussions for terrestrial protected areas. To begin addressing the issue, IUCN organized a workshop of experts and managers in Washington, DC, in January 2018 to discuss how the classification system for MPAs can better ensure that areas designated and reported as MPAs are truly effective measures for marine protection.

These clarifications should help to inform decision-makers, scientists, and communities in the planning and establishment of new MPAs, which will have a stated conservation purpose. They will also help to guide continuous improvement of previously established areas that fall short of agreed global standards. *[Editor's note: View the global MPA standards from IUCN [here](#).]*

What were the outcomes of the workshop?

Wong: We know that well-designed and effectively managed MPAs conserve marine biodiversity and provide social, economic, and cultural benefits. The consensus outcome from the workshop was the need to publish a [short document](#) which makes clear what activities can and cannot take place in an MPA. The document does not propose new standards but emphasizes applying global standards that have already been agreed upon. The document also encourages governments to ensure that their MPA designations and reporting meet these standards of protection.

The workshop reaffirmed that the primary purpose of an MPA must be the conservation of biodiversity and that industrial activities are not compatible with MPAs. Our workshop also highlighted that at the 2016 World Conservation Congress in Hawaii, IUCN members [recommended](#) "a network of highly protected MPAs ... creating a fully sustainable ocean, at least 30 percent of which has no extractive activities" for the future.

Through an elaborate consultation process, IUCN shared the draft document

with members in February 2018 and accepted comments through April 2018. We received a lot of engagement from governments and stakeholders from around the world and have put together a document that helps clarify the difference between an MPA and areas designated for other uses, such as fisheries management.

So is this a new definition of an MPA?

Wong: No, this is not a new definition. The standards document was written using existing agreed-upon resolutions, recommendations, and [guidance from the IUCN](#). What we did was to compile previously agreed criteria for what comprises a marine protected area in a single document — something that had not previously been done — and eliminate any doubt as to the kinds of activities allowed within a designated marine protected area.

We simply want to provide clarity to help countries report more accurately to the WDPA so that we can properly track progress of how much of the ocean is actually protected. The onus is ultimately on the countries themselves to follow, set, and meet these standards in their marine protection planning. But the IUCN will continue to work with its member states to help them adhere to and integrate these standards in their new MPAs, as well as to advise them on how they can improve upon existing MPAs that do not meet the standards.

How do you expect countries to apply the standards?

Wong: The goal here is to facilitate continuous improvement. The broad application of the term MPA has resulted in some countries reporting MPAs that do not meet the global standards. These areas may provide little to no conservation benefits right now, but it does not mean we throw up our hands and give up. Conservation is a perpetual process and by recognizing the need to change our approach we can make real progress for the future. We have seen such advancements in terrestrial protected areas under the [IUCN Green List](#) program. We know that by clarifying what qualifies as an MPA, we can help countries work towards creating real protected areas and meeting the qualitative as well as the quantitative elements of Aichi Target 11. By taking these actions, our next generation will be able to witness improvements in the health of our oceans and reversals in the downward trend of marine biodiversity. 

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For further information

MPA website of the World Database on Protected Areas. [Click here](#)

Atlas of Marine Protection, produced by Marine Conservation Institute. [Click here](#)

Sala, E. et al. "Assessing real progress towards effective ocean protection." *Marine Policy*, May 2018 [Click here](#)

"Is Canada taking shortcuts to meet its marine protection targets?" *Hakai Magazine*, July 2018. [Click here](#)

Costello, M. "Marine nature conservation must focus on fully-protected reserves, not resource management." Blog post, July 2018. [Click here](#)

New management concepts at one of the world's oldest MPAs: Building financial sustainability for the Exuma Cays Land & Sea Park, The Bahamas

By Captain Joseph Ierna Jr.

Editor's note:

Joseph Ierna Jr. is the Administrator of the Exuma Cays Land & Sea Park in the Caribbean nation of The Bahamas.

The business of marine protected areas is as diverse and complex as the environment we are managing. Through word association, here is a small glimpse of what we may encounter on a daily basis in one of our national parks:

Staffing, budgets, maintenance logs, patrol logs, standard operating procedures, ethics, conservation, research, education, science, technology, tourists, locals, private islands, big boats, little boats, moorings, anchorage, weather, currents, patrol, drones, CCTV, internet, satellite, vessels, groundings, firefighting, missing persons, illegal activities, poaching, theft, drugs, invasive species eradication, funding, government, grants, philanthropy, filmmakers, MOUs, generators, watermakers, renewable energy, waste management, pollution, plastics, and much more!

Recently I was afforded the great honor to serve as the Administrator of the 455-km² Exuma Cays Land & Sea Park (ECLSP) here in The Bahamas. This national park, designated in 1959 and a no-take since 1986, is one of the oldest marine parks in the world. It is managed by the Bahamas National Trust (BNT), an NGO that operates The Bahamas' entire 8900-km² national parks system.

Prior to my position with the ECLSP, I led an effort – still underway – to plan a financially sustainable MPA from the ground up: the Long Island Marine Management Area, also in The Bahamas. The concept is that MPAs should be run more like the private sector, namely by serving customers' needs – as well as the ecosystem's – and generating revenue in the process. [Editor's note: [MPA News profiled this effort in a 2015 article.](#)]

Similar ideas can be applied at a long-established MPA like the ECLSP, too. That is what we are looking to do. The ECLSP costs roughly US \$750,000 to operate annually but currently runs a \$300,000 deficit. And needed re-development of the park's infrastructure – including new buildings and lab space, repairs to existing structures, additional vehicles and vessels, and new energy and communications systems – will cost an additional \$4.6 million. New revenue is necessary.

Aligning parks and the private sector

So how can we generate the new revenue? For that matter, how can protected areas worldwide – which all too often have inadequate funding – generate new, self-sustaining revenue streams?

One viable path is for protected areas to align with private sector projects. Through such partnerships, revenue from private sector partners is fed into protected areas' conservation efforts. In the case of the ECLSP, for example, natural partners could include the yachting industry, filmmakers, and scientists willing to pay a fee to work in a healthy ecosystem with high-quality lodging and lab space. The park already generates fees from mooring, anchorages, and camping but can do more. We need to get creative about identifying these partnership opportunities and bringing the protected areas and private sector communities together.

In recent years, the ECLSP has explored many ideas about public-private partnerships. But concerns about the perception of putting business interests ahead of natural resource protection have led this to remain a largely untapped funding mechanism for the park.

However, in the past five months of operations, as Park Administrator, I have led negotiations with private sector players and we are now advancing these ideas into commitments of possible investment actions. Such partnerships represent advantages for both sides. The private sector partner would receive access to operate in one of the most beautiful places in the world – with strong accountability measures built in. The park would gain funding needed to purchase equipment, strengthen infrastructure, and build staff and operations capacity.

Challenging the private and public sectors to fund parks

We have an opportunity before us to make a difference for future generations. It is time to take the next step and challenge private and public sectors to direct funding resources to operate our protected areas. We need to identify the economic incentives. I am encouraged here at the ECLSP: we are on the forefront of setting standards in operating financially sustainable national parks, including eventually across The Bahamas' national system of 32 sites. This is the future for protected areas. 

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<https://mpanews.openchannels.org/node/22824>

Researchers, take note: P-values do not tell you what you probably think they do

Researchers rely on statistics in their work and p-values are a commonly used statistical tool, including in fisheries and marine conservation science (among many other fields). P-values are widely interpreted as a way to determine the probability that a null hypothesis is true or false. A p-value less than 0.05, for example, is often taken to mean an experiment's findings are "significant" and the null hypothesis should therefore be assumed false.

But that assumption is a fundamental misunderstanding of what p-values actually tell us. As data scientist Mike Hay points out in three recent blogs on OpenChannels.org ([first](#), [second](#), and [third](#)), a p-value is really the probability that, if the null hypothesis were true, we would obtain a statistical result as extreme or more extreme than we got with our data. That is quite different from how it is typically applied and understood.

As evidence of that difference, Hay shows how a "significant" result under 0.05 could actually have more than a 50% chance of being incorrect(!). "Calling everything with $p < 0.05$ 'significant' is just plain wrong," he writes. Hay works for OCTO, which also publishes MPA News.

Interpreting p-values incorrectly presents a threat to the credibility and accuracy of scientific results, he writes. The fields of psychology and medical science are currently experiencing replication crises due to the use of poor statistical methods. "Fisheries and marine policy have many of the same risk factors driving the unreliability of scientific findings in those other fields, but no one has actually attempted to do any replication studies yet," says Hay.

His blogs are a plea to marine scientists to tighten up their statistical methods. Hay [recommends greater use of Bayesian statistical models](#), which can more easily avoid the pitfalls of p-values. 

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To comment on this article:

<https://mpanews.openchannels.org/node/22826>

MPA Science Corner

Most of remaining marine wilderness is not in MPAs yet – MPA success and failure –
Reefs that could survive climate change – Inefficient MPAs – Making permit decisions
for MPA research

These recent articles on MPA-related science and policy are all free to access.

• **Article:** Jones K. R. et al. "[The Location and Protection Status of Earth's Diminishing Marine Wilderness](#)." Current Biology (2018) [Editor's note: this paper is only temporarily free to access. However, the manuscript will continue to be available for free at <https://marxiv.org/azq53>.]

Finding: This study finds that just 13% of the global ocean could be considered wilderness – i.e., free of intense human impacts that threaten biodiversity. And less than 5% is both wilderness *and* currently in MPAs.

• **Article:** Giakoumi, S. et al. "[Revisiting 'Success' and 'Failure' of Marine Protected Areas: A Conservation Scientist Perspective](#)." Frontiers in Marine Science 5, (2018)

Finding: This study identified factors for MPA success and failure using peer-reviewed publications and expert knowledge. Stakeholder engagement was considered the most important success factor, and its absence was the main cause of failure.

• **Article:** Beyer H. L. et al. "[Risk-sensitive planning for conserving coral reefs under rapid climate change](#)." Conservation Letters (2018)

Finding: This study applies Modern Portfolio Theory – an approach used in financial analysis to reduce risk – to create a global selection of reefs with a higher chance of surviving climate change impacts and being able to regenerate other reefs.

• **Article:** Jantke, K. et al. "[Poor ecological representation by an expensive reserve system: Evaluating 35 years of marine protected area expansion](#)." Conservation Letters (2018)

Finding: This global study of MPA efficiency suggests MPAs are often unnecessarily expensive in terms of their impact on fisheries, and also miss protecting many unique ecosystems.

• **Article:** Saarman, E. T. et al. "[An ecological framework for informing permitting decisions on scientific activities in](#)

MPA News

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[protected areas.](#)" PLOS ONE 13, e0199126 (2018)

Finding: This study gives MPA managers a framework to help them weigh the costs and benefits of proposed research projects, and to make informed permitting decisions based on potential ecological impacts of the research.

For a free, weekly list of the latest publications on ocean planning and management, including MPAs, [subscribe to the OpenChannels Literature Update here](#).

In addition, [OCTO](#) – the organization that produces MPA News and OpenChannels – also runs [MarXiv](#), the free

research repository for marine conservation science and marine climate change science. Each week the MarXiv team produces [brief, one-page summaries of selected papers](#) in its repository for an audience of managers and policymakers. Share your research in MarXiv now and we may summarize your paper, too! 

To comment on MPA Science Corner:

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Notes & News

Large meteorite lands in MPA

Add this to the tasks of an MPA manager: What do you do when a large meteorite lands in your MPA? The Olympic Coast National Marine Sanctuary (OCNMS), off the Pacific coast of the US, asked that question in March 2018 when a two-ton space rock flew into Earth's atmosphere, became a giant fireball, broke up into countless pieces, and crashed into the MPA's waters. The impact was detected on seismometers nearly 3000 km away.

In what is believed to have been the world's first hunt for a meteorite at sea, scientists from OCNMS and other institutions recovered fragments of the rock in July 2018. Using a remotely operated vehicle, the expedition found meteorite debris 25 km offshore, lodged in the seafloor's mud and sand in waters 100 meters deep. A [press release is here](#) and [media coverage is here](#).

Belize Barrier Reef removed from World Heritage in Danger list

In June, the Belize Barrier Reef Reserve System – a UNESCO World Heritage Site and the world's second largest coral reef system after the Great Barrier Reef – was removed from the List of World Heritage in Danger. The decision was taken at UNESCO's annual World Heritage Committee meeting and followed the advice of IUCN. For nearly 10 years, the Belize Barrier Reef has faced threats from potential oil exploration and unsustainable tourism development. But Belize's announcement of a ban on oil drilling across its marine territory, as well as reinforcement of legal protections against development in its mangroves, led to the positive upgrade by UNESCO. An IUCN [press release is here](#) and UNESCO's [announcement is here](#).

Canada to designate 1000-km² MPA

The government of Canada has announced its intent to designate a 1000-km² MPA within the Gulf of St. Lawrence, in eastern Canada. The proposed Banc-des-Américains (American Bank) Marine Protected Area has been an Area of Interest under Canada's Oceans Law since 2011. The MPA designation proposal [underwent a 30-day public consultation process](#) in June-July 2018 and the MPA is expected to become an official MPA in 2018.

The site provides important habitat for North Atlantic right whales, blue whales, leatherback turtles, and several commercially important species of fish and crustaceans. The proposed regulations for the MPA would establish two management zones. Commercial and recreational fisheries would be prohibited in Zone 1, although fishing by indigenous groups for food, social, and ceremonial purposes would be permitted. In Zone 2, commercial trap, longline, and hand-line fishing would be allowed as long as they are not for certain forage fish species. A background on the proposed MPA [is here](#). A press release by the Canadian Parks and Wilderness Society (CPAWS), which campaigned for the MPA for several years, [is here](#).

Majority of krill fishing industry agrees to closures in Antarctic coastal waters

An association of companies that together represent 85% of the Antarctic krill fishery has voluntarily agreed to stop fishing in waters around the Antarctic Peninsula where penguin colonies are present. The voluntary closures will cover roughly 74,000 km² and will become permanent in 2020.

The commitment was made by the Association of Responsible Krill Harvesting (ARK), which has member companies from Norway, Chile, South Korea, and China. One of the companies, Aker BioMarine, said in a statement, "Through

our commitment we are showing that it is possible for no-fish zones and sustainable fisheries to co-exist. Our intention with this commitment is to support [the Commission for the Conservation of Antarctic Marine Living Resources]'s work on establishing a network of large-scale science-based marine protected areas in the Antarctic." An ARK [press release is here](#). A Greenpeace [press release is here](#).

Insurance industry launches commitment to protect World Heritage Sites

[UN Environment's Principles for Sustainable Insurance Initiative \(PSI\)](#) – a collaborative initiative between the United Nations and the insurance industry – has launched the first-ever global insurance industry [statement of commitment](#) to protect the outstanding universal value of World Heritage Sites. The statement commits signatories to take various actions to prevent or reduce the risk of insuring and investing in companies or projects whose activities could damage World Heritage Sites.

Early signatories to the statement include Swiss Re, Peak Re, National Reinsurance Corporation of the Philippines, Interamerican, La Banque Postale, Risk Management Solutions, Certified Sustainable Insurance Partners, Microinsurance Network, Philippine Insurers & Reinsurers Association, Earth Security Group, and ICLEI – Local Governments for Sustainability.

"The industry's risk management services, insurance solutions, and investments are powerful ways to tackle increasing economic, social, and environmental challenges," said Butch Bacani, who leads the PSI at UN Environment. "With this global commitment, insurers are speaking with a united voice to protect the priceless and irreplaceable assets that make up our world heritage for present and future generations." The statement was launched in partnership with WWF and the UNESCO World Heritage Centre. UNESCO's [announcement is here](#).

MPA readings from around the web

- **Study: Do Coral Reef Reserves Protect Ocean Life? Yes, But....** (via Oceans Deeply)

Examining whether it's better to preserve marine areas that are still pristine or those that need the most protection. [Click here](#)

- **Blue finance: Why marine PPPs could be a win-win** (via Euromoney)

How an MPA in the Dominican Republic – the Southeast Reef Marine Sanctuary – might show how protected areas can pay for themselves. [Click here](#)

- **Bold initiative aims to protect coral reefs in the Dominican Republic** (via Mongabay)

Another article on the Dominican Republic's Southeast Reef Marine Sanctuary. [Click here](#)

- **Malaysia's Conservation Experiment: One marine park in Malaysia is trying to find a collaborative solution to Southeast Asia's environmental woes** (via The Diplomat)

Detailing challenges facing Tun Mustapha, Malaysia's largest MPA, and its surrounding communities. [Click here](#)

- **The importance of gender equality in conservation** (via IUCN Save Our Species)

An interview with IUCN's Global Gender Office. [Click here](#)

- **What Does This Deep-Sea Expedition Mean for the Indigenous Haida Nation?** (via Forbes)

How a deep-sea expedition of a Canadian MPA was co-managed by the indigenous Haida Nation, the Canadian government, and others. [Click here](#)

- **Intelligent drones crack down on illegal fishing in African waters** (via UN Environment)

How a former Microsoft executive is using drones and artificial intelligence to track illegal fishers in West Africa. [Click here](#) 

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- The Reverse Fishing License Mechanism for Kiribati's Phoenix Islands Protected Area: An Experiment in MPA Financing
- CCAMLR Fails to Make Progress in Establishing Antarctic MPAs

Ten years ago: [July 2008](#)

- What Does Your MPA Cost?: Considering the Various Costs of MPAs to Stakeholders and Management
- MPA Perspective: The Outer Continental Shelf – Opportunities for Marine Environmental Protection

Fifteen years ago: [July 2003](#)

- Using Locals in Enforcement, Some MPA Managers See Improved Compliance as a Result
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