**RETHINKING, REFRAMING, RE-IMAGINING THE IDEA OF OCEAN CONSERVATION: MARINE PROTECTED AREAS TO ENSURE A VIBRANT FUTURE**

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**The Problem**

Large ecosystems within the ocean were once de facto Marine Protected Areas (MPAs) simply because they were too far from land, too deep, or too inaccessible to exploit for human economic activity. Today, we fish, mine, and drill almost everywhere. We continue to develop better technologies to extract and exploit ocean resources to feed and power society. Consequently, these activities in conjunction with land-based extraction have seriously depleted and disrupted ocean ecosystems. These activities driven by larger economic forces primarily impact coastal communities that depend on the ocean for livelihoods and the rich array of creatures who call the ocean home. However, the value chains derived from these ecosystems and geographies reach far down the value chain to almost every human community.

From a conservation perspective, creating safe havens for life in the ocean is necessary and intuitive to the long-term sustainability of ocean ecosystems and resources. However, fishers, corporate interests, and communities often view MPAs and their expansion as a "net loss," despite studies indicating the long-term economic benefits of MPAs networks. There is broad acceptance of "green parks" on land, but demonstrating positive impacts that ultimately effect nearby communities with "blue parks" remains a challenge.

The concept of MPAs is not new – the first one on record (apart from tapu sites known from many native people's oral histories) was in 1888. Nonetheless, until about a decade ago, only 1% of the ocean was in any form of protection and less than 0.1% was fully protected from extractive activities. Over the last decade, there has been a major push to create more protected areas; we now have about 4% designated as an MPA and about 2% are fully protected. Countries have pledged to set aside 10% by 2020; scientists say we need at least 30% set aside in MPAs.

If MPAs continue to increase in size, what kinds of scalable efforts can drive change in public and local support, and how can we measure and ensure efficacy in these efforts?

**Core Constraints**

MPAs are constrained by three major factors in public opinion:

- Lack of awareness about the low area coverage of MPAs;
- Lack of knowledge and awareness of massive conservation benefits of fully protected MPAs;
- Lack of knowledge and understanding that those benefits spill out to adjacent areas and help make the oceans more resilient.

MPAs are further constrained by forces that impact their existence and efficacy:

- Commercial interests and small-scale fishers and communities who use the ocean now see MPAs as a negative, as a loss, and not an investment in the future;
- In some communities, community-based management projects offer some respite for depleted ecosystems and populations, but they require clearly delineated rights, and may not scale

beyond the community;
- Real-time monitoring and enforcement remains a critical challenge that while technology exists, action is much less frequent and politically untenable in many cases;
- Powerful lobbies for extractive industries push hard against MPAs; too few are pushing for them.

How might we increase awareness of the need, and the merits, but especially the long-term benefits of protecting the ocean that sustains us? The future of the ocean is one juxtaposed by the ability to use the resources in the ocean while ensuring they continue to exist for future generations and without destroying marine ecosystems completely.

**Challenge Statements**
This is a big challenge, with many possible solutions. Consider designing solutions that are scalable and address one or all of the following categories:

1) LOCAL AWARENESS SYSTEM: How might we create tools and systems to not only raise local awareness of the (ecological, cultural, and financial) benefits of MPAs, but also make sure that the protected areas maintain a viable ecosystem with healthy populations of marine life? Solutions might include, but are not limited to, technology to connect communities directly to local MPAs, more effective ways of demonstrating MPA impact, and technology-integrated systems for better participatory management of MPAs locally.

2) MONITORING & ENFORCEMENT: What kinds of scalable tools and systems can accurately monitor and enforce the protection of MPAs in new ways, so that "enforcement" is not perceived as yet another reason for powerful lobbies to view MPAs as negative? What kinds of functions can these technologies help augment and improve the functions of policy makers and managers of MPAs?

3) FINE-GRAIN MARINE SPATIAL PLANNING: What are the tools and systems needed for multi-stakeholder sustainable use of MPAs (cultural, economic, and environmental)? How might we create tools to design MPAs like how terrestrial multi-use protected areas are designed – what are the ecologically relevant spaces, what are the spaces for multi-use, how do you design for both economic outcomes & protection of marine life?

**Background Information**
For some local context in Sarawak, there is one national marine park located off the coast of Kuching, as well as multiple land-based parks that contain vital coastal and wetland ecosystems. Talang Satang National Park centers around two vital islands off the Sarawak coast with small protected regions of reefs surrounding the islands. Tourist access to the island is heavily controlled and quite expensive. There is a sea turtle hatchery hosted on the island as well as one in Tanjung Datu National Park on the border with Kalimantan. Talang-Satang National Park covers an area of 19,414 hectares and was created in 1999 to enhance marine turtle conservation in Sarawak.

Sea turtle eggs, while illegal to sell or consume in Sarawak and Sabah, are a common and prized delicacy in Sarawak and throughout Malaysia. Many local fishermen will scout beaches both in and around national parks and harvest eggs from nests for personal consumption and sale to others in their community. There is minimal enforcement of the illegal sale or consumption of sea turtle eggs (perhaps due to the limited size of the staff, resources, and few park rangers) and a lack of community

support for any large-scale behavior change. Similar problems are faced by coastal and island communities throughout Malaysia and Southeast Asia. In this example, the MPA could be expanded to include the coastal regions around the islands and additional coastline and reefs. However, enforcement and monitoring would remain a critical challenge to enacting change with demonstrable environmental impacts. The fishery off the coast of Kuching is a critical one for local economies and the Sarawak government is constructing a massive fish intake port to process catches and centralize management for accurate catch counts. Ensuring local economic and environmental sustainability are two critical inter-related challenges. Local fishermen and communities who rely on the resources from these coastal areas would need to be incentivized to not collect and consume sea turtle eggs.

**Further Reading and Examples**

For updated information on MPAs, see IUCN: https://www.iucn.org/news/protected-areas/201709/global-shift-marine-protected-area-analysis-and-reporting

For novel monitoring technologies, be inspired by Sail Drone: https://www.saildrone.com

A comprehensive report on Surveillance and enforcement of Remote Maritime Areas can be found here: https://www.dropbox.com/s/27og2eo6o10e0jk/serma_tech-options_v12.pdf?dl=0

**Reports and Papers**
**See MPA folder in this Dropbox:**
https://www.dropbox.com/sh/h3u5c1tqm1iibss/AADV7N2BGnsZ4MkSTq-8UGAda?dl=0

McCook et al. Adaptive management of the Great Barrier Reef: A globally significant demonstration of the benefits of networks of marine reserves:
https://www.dropbox.com/s/6i3ijqr4f2ztxj1/McCook%20et%20al.pdf?dl=0

Bennett, NJ; Dearden, P: From measuring outcomes to providing inputs: Governance, management, and local development for more effective marine protected areas:
https://www.dropbox.com/s/adf81disy6couhy/Bennett%20and%20Dearden%20From%20measuring%20outcomes.pdf?dl=0

Bennett, NJ; Dearden, P: Why local people do not support conservation: Community perceptions of marine protected area livelihood impacts, governance and management in Thailand:
https://www.dropbox.com/s/l2wm99xbxin16y3/Bennett%20and%20Dearden%20Why%20Local%20People%20do%20not%20support%20conservation.pdf?dl=0

OECD: Marine Protected Areas Economics, Management and Effective Policy Mixes:
http://www.oecd.org/env/marine-protected-areas-9789264276208-en.htm

Lubchenco J. and Grorud-Colvert, K. Making waves: The science and politics of ocean protection:
https://www.dropbox.com/s/ug54hhdzkwh4azu/Lubchenco%20and%20Grorud-Colvert%20Science%20paper.pdf?dl=0

UNEP: Protected Planet Report 2016: https://www.unep-wcmc.org/resources-and-data/protected-planet-report-2016

Gill et al. Capacity shortfalls hinder the performance of marine protected areas globally: https://www.nature.com/articles/nature21708

Edgar et al. Global conservation outcomes depend on marine protected areas with five key features: https://www.nature.com/articles/nature13022

Mascia et al. Impacts of marine protected areas on fishing communities: https://onlinelibrary.wiley.com/doi/pdf/10.1111/j.1523-1739.2010.01523.x

Erisman et al. Fish spawning aggregations: where well-placed management actions can yield big benefits for fisheries and conservation: https://onlinelibrary.wiley.com/doi/pdf/10.1111/faf.12132