**Evaluating the effectiveness of TURF-reserves in Mexico**

**Proposers:**

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**Client:**

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**Project**

*Objectives*

The objective of this project is to evaluate the effectiveness of TURF-reserves established as collaboration between fishermen communities along Mexico and Comunidad y Biodiversidad (COBI). We aim to understand the degree to which management actions have achieved the goals and objectives –social, ecological, and economical- of each TURF-reserve. Thus, the project will focus on answering the following questions:

1. Environmentally, what is the state of the established TURF-reserves?
2. What are the economic costs / benefits related to establishing a TURF-reserve, and how long does it take for the benefits to out-top the costs?
3. Into what extent have the goals been met in each community, and how much time has it taken?

And also identify what has allowed for each location to stand where they are, and provide a framework in which we describe what combinations of socio-economical characteristics enable a successful partnership between COBI and coastal communities, and how this is translated in terms of conservation. Toooootaly rephrase this

*Significance*

Marine ecosystems around the world sustain significant anthropogenic impacts from activities such as overfishing, habitat deterioration, destructive fishing practices, pollution, and climate change (Halpern *et. al.*, 2008; McCauley *et al.,* 2015). Multiple solutions have been proposed in order to manage fisheries and restore marine environments. Two of the most widely used management strategies are Territorial Use Rights for Fisheries (TURFs) and Marine Reserves (MRs), which are usually implemented separately (Afflerbach *et al.,* 2014). Nevertheless, there are cases when both strategies are used together, thus creating TURF-reserves (Costello and Caffine, 2009).

TURFS are areas where exclusive extraction of natural resources is granted to fishers (Christy, 1982). The ownership of an area incentivizes fishers to sustainably manage their resources (Afflerbach *et al.,* 2014). MRs are areas from which extraction is null or limited. While MRs have proven to increase biomass (Lester *et al.,* 2009), and enhance resilience of the bounded region (Micheli *et al.,* 2012), they cannot solve everything. Thus, the combination of two of the most effective management strategies seems plausible.

In Mexico, until the last years, TURF-reserves established by TURF owners had no legal support, and were only recognized as so by the owners. This scheme did not allow a correct enforcement of the areas, and thus threatened the potential of recovery. Nevertheless, a recent regulation now allows TURF owners to establish a legally supported No-Take MR within their granted area.

COBI is one of the largest Marine Conservation NGO’s in Mexico, and has devoted 15 years to establish TURF-reserves in collaboration with coastal communities. Providing an assessment of the performance of these reserves will not only provide COBI with tools to better incentivize other communities …. Needs more

*Background*

Working tightly with coastal communities, COBI has established TURF-reserves: a coupling between Territorial User Rights for Fisheries and Marine Reserves. These TURF-reserves have been established in fisherman communities in three main regions: the Pacific Ocean, Gulf of California, and the Caribbean. Amongst these regions, COBI works with a total of 15 communities, where at least one TURF-reserve has been established.

Some of them have been in established for up to 10 years, and recovery has been observed in some TURF-reserves (*e.g.* Micheli *et al.,* 2012 for Isla Natividad, or Villaseñor-Derbez *et al.,* 2015 for Isla Magdalena). Yet, COBI lacks a national approach that comprehensively describes the state of each TURF-reserve. Needs more

*Available data*

Thanks to the yearly monitoring program at each location, COBI has an extensive database. The data includes fish count data, invertebrate count data, algal cover, and habitat heterogeneity. It is important to mention that all locations were sampled before the implementation of the TURF-reserves, thus providing us with a base line. There is data available for each TURF-reserve and its respective control zone. Databases will allow us to evaluate the recovery of the TURF-reserves, and may be made available to the group as soon as needed.

*Possible approaches*

Due to the environmental differences between the regions where COBI has established reserves, databases have slight differences between them. The first step will be to standardize databases into a common format that allows the group to work more efficiently.

To evaluate the recoveries of the TURF-reserves, we will look at yearly blah blah blah, just using the methods by Caselle et al, 2015

To evaluate the effectiveness of the TURF-reserves, the client has suggested to use IUCN’s “How is your MPA doing?” framework.

*Deliverables*

In addition to the final written report, poster, and oral presentation required by Bren School, our client has required us to provide at least one peer-reviewed article in which we report and summarize the major findings. We will also provide a translated and summarized version of the final report, as an internal document for COBI. This document must contain a framework in which we describe whatever I write down in objectives

*Internships*

COBI will provide at least one summer internship in Mexico for one of the students of the project. The intern(s) will work at one of COBI’s offices (Guaymas, La Paz or Puerto Morelos). They will work in the Marine Reserves project, under direct supervision of the regional Marine Reserves Manager (Alvin Suárez, Arturo Hernández, or Stuart Fulton, respectively). Financial support covering travel expenses may be available.

Number of internships and brief explanation, better develop in the supporting materials

**Supporting Materials**

*References*

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Costello, C., Kaffine, D.T. 2010. Marine protected areas in spatial property-rights fisheries. *Australian Journal of Agriculture and Resource Economics*, 54, 321–341.

*Budget and justification*

We do not expect the project’s basic operations during the school year to exceed the stipend provided by the Bren School ($1,300.00).

*Client letter of support (addressed to the group project comitee)*

* + 1. Internships
       1. Describe internships
    2. Funding
    3. Data