A COLLABORATIVE RESEARCH FRAMEWORK TO COLLECT DATA FOR THE UNDERSTANDING OF COASTAL AND MARINE ECOSYSTEMS AND FISHERIES

Marcia Moreno-Báez[1], Catalina López-Sagástegui[2], Victoria Mariel Jiménez Esquivel[3], Octavio Aburto-Oropeza[1]

1. Scripps Institution of Oceanography, University of California San Diego; 2. University of California Riverside, UC MEXUS University of California; 3. Centro para la Biodiversidad Marina y la Conservación, A.C.

INTRODUCTION

Despite a heavy reliance on scientific research as the primary source of information to understand linkages between marine ecosystems and fisheries, a multi and interdisciplinary framework where geo-technologies and the fishing communities are included in a more participative manner is needed.

The incorporation of participatory approaches of collaboration, cooperation and co-production of information, guarantees the support needed to integrate the unique knowledge, experience, and skills of fishers and scientists. This paper describes a framework where fishers' and other community members' participation is crucial to understand the spatial and temporal dimension of small-scale fishing activities and their linkages with marine resources.

The framework was developed in the context of small-scale fisheries in Northwest Mexico. The procedure includes four phases:
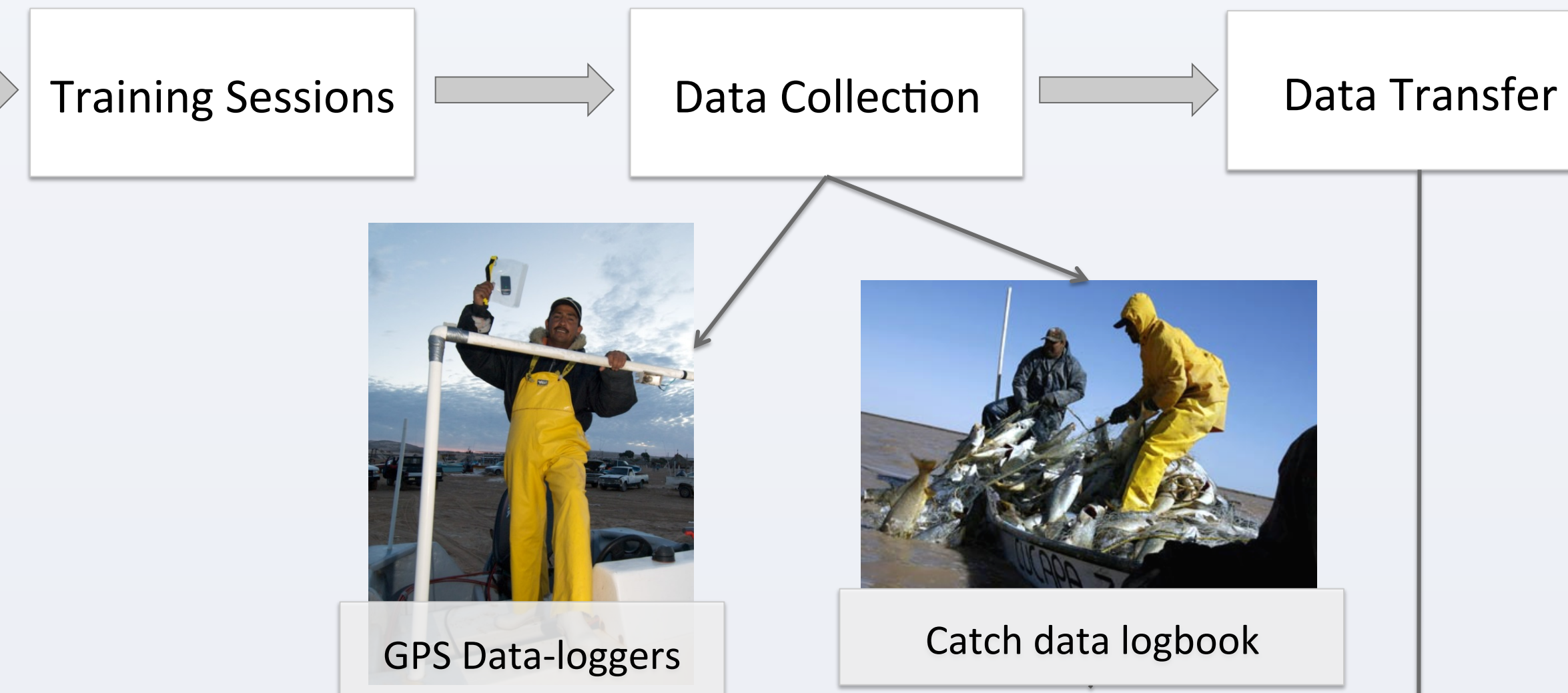

Participatory Fisheries Research Process
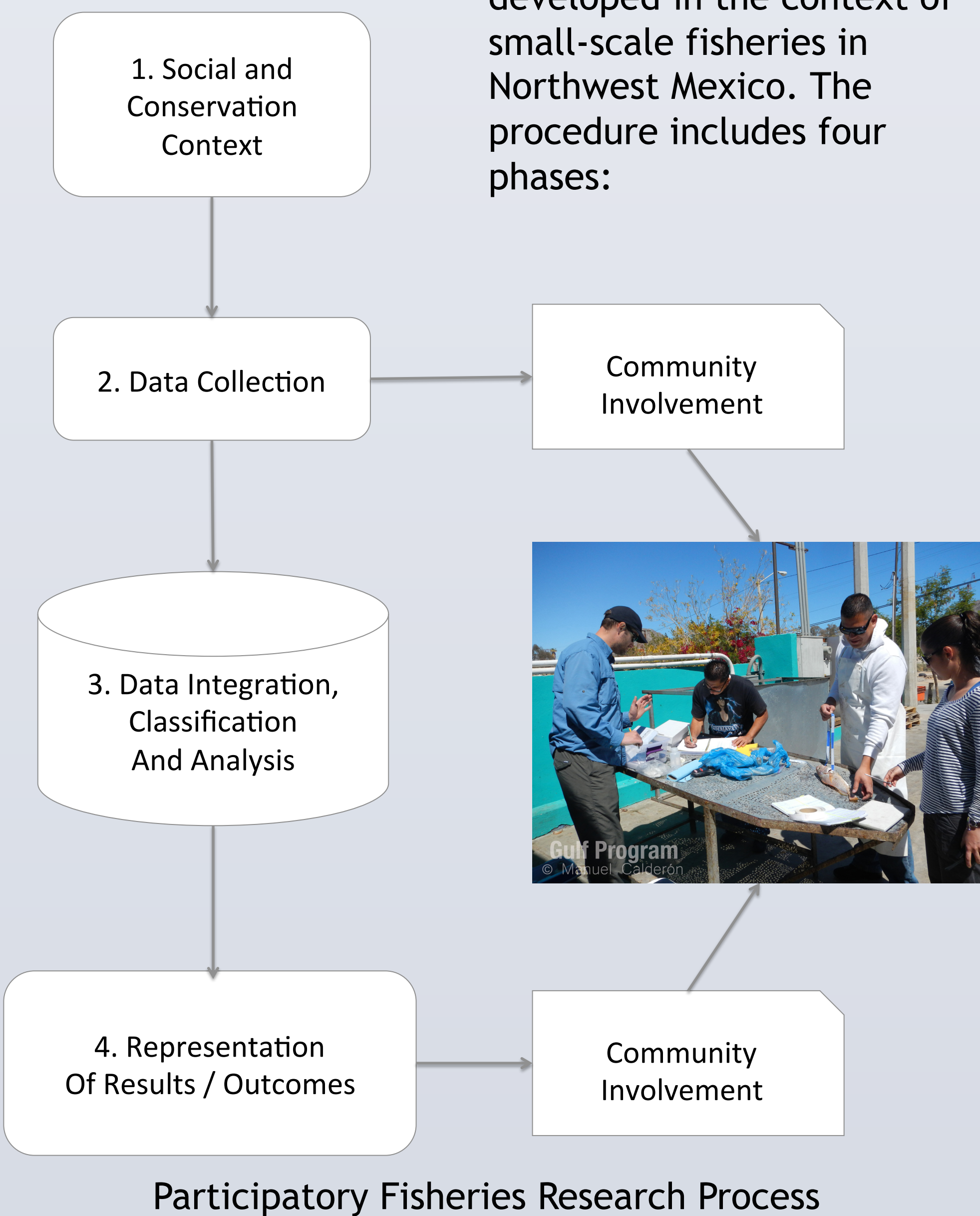
METHODS

1. Social and Conservation Context
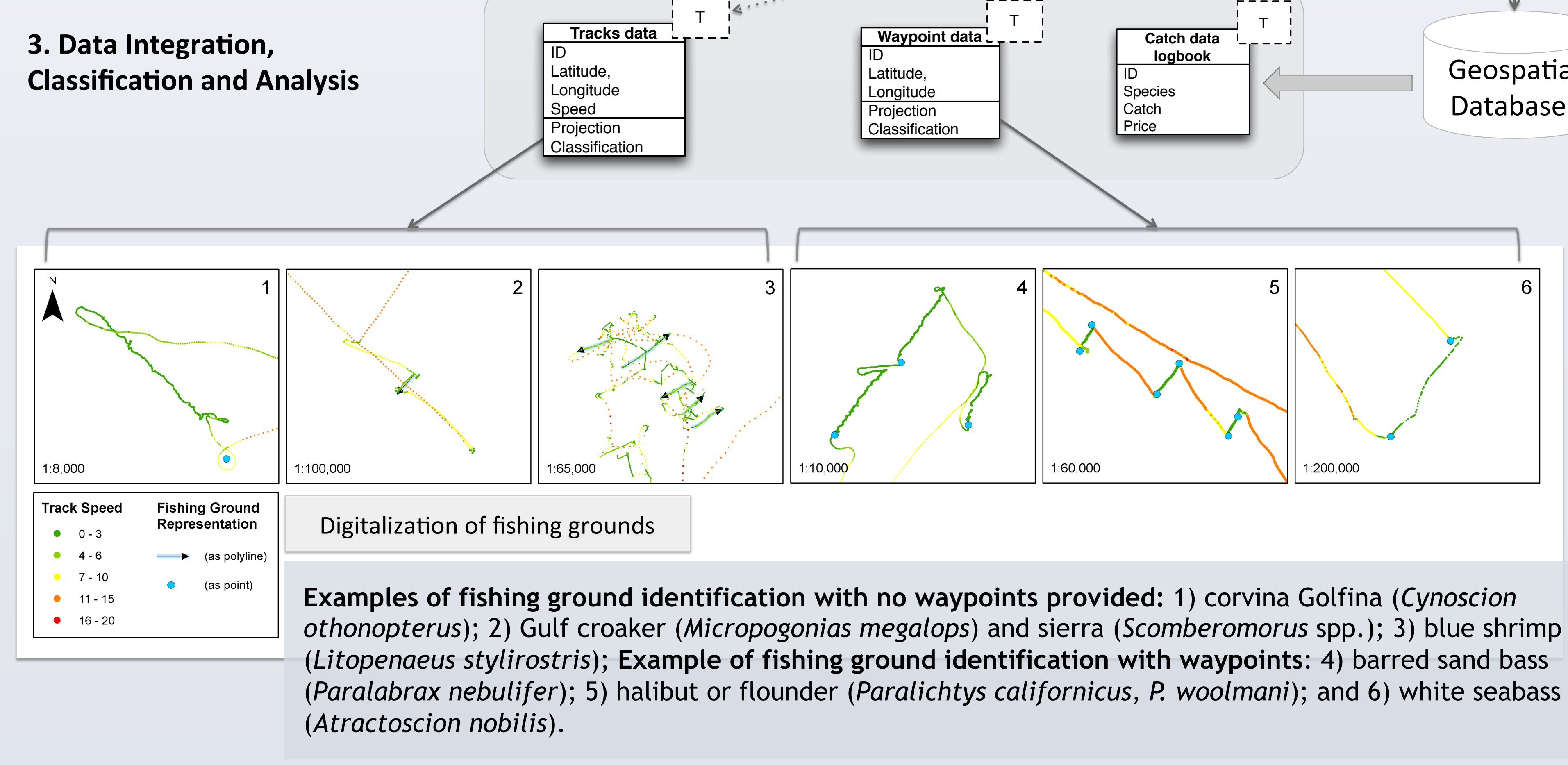
We describe a methodology where the use of GPS data-loggers and catch data are used to map target species with commercial value.

Public Meetings

2. Data Collection Process

Training Sessions → Data Collection → Data Transfer

GPS Data-loggers   Catch data logbook

3. Data Integration, Classification and Analysis

Tracks data	Waypoint data	Catch data logbook
ID	ID	ID
Latitude	Latitude	Species
Longitude	Longitude	Catch
Speed	Projection	Price
Projection	Classification	
Classification		

Geospatial Databases

Track Speed	Fishing Ground Representation
0 - 3	(as polyline)
4 - 6	(as point)
7 - 10	
11 - 15	
16 - 20	

Digitalization of fishing grounds

Examples of fishing ground identification with no waypoints provided: 1) corvina Golfina (*Cynoscion othonopterus*); 2) Gulf croaker (*Micropogonias megalops*) and sierra (*Scomberomorus* spp.); 3) blue shrimp (*Litopenaeus stylirostris*); **Example of fishing ground identification with waypoints:** 4) barred sand bass (*Paralabrax nebulifer*); 5) halibut or flounder (*Paralichtys californicus*, *P. woolmani*); and 6) white seabass (*Atractoscion nobilis*).

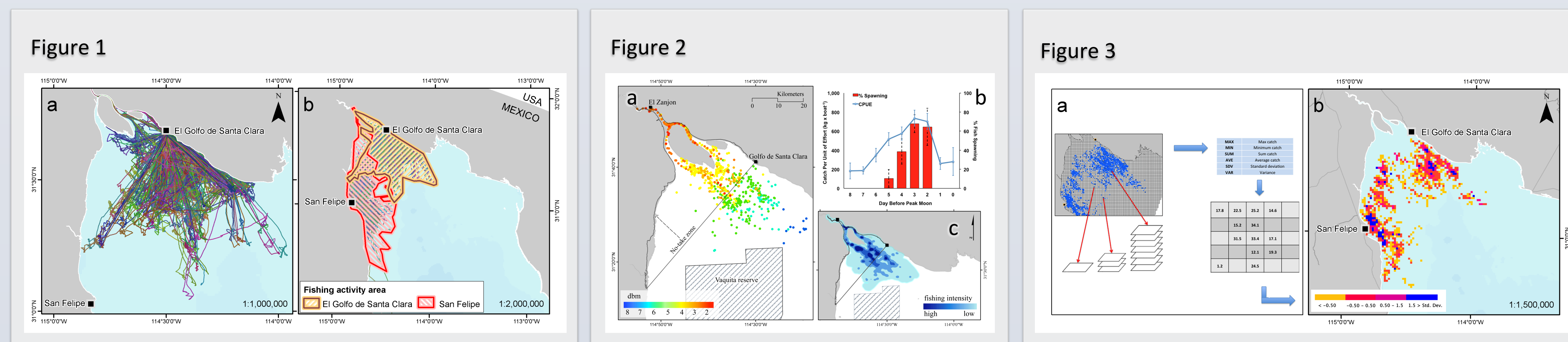## SPATIAL AND TEMPORAL REPRESENTATION OF DATA

Figure 1: a) Fishing trips displayed as tracks for one year in El Golfo de Santa Clara, Mexico; b) Fishing activity area polygon for El Golfo de Santa Clara and San Felipe, Mexico, showing a common area of fishing activity. Figure 2: From Erisman et al., 2012: a) positions of Gulf corvina (*Cynoscion othonopterus*) spawning aggregations in relation to lunar day (day before peak moon, dbm) and management zones within the Biosphere Reserve; b) semi-lunar trends in catch rates of the Gulf corvina fishery; c) spatial fishing intensity; Figure 3: a) assignment of catch data through the spatial join tool and statistics obtained by pixel through summarized process tool; b) example of total catch per area (sum of catch per cell) for Gulf croaker (*Micropogonias megalops*) in one fishing season, using the Standard deviation classification method.

DISCUSSION & CONCLUSION

- An effective collaborative framework can be achieved by providing access to the findings to a diverse range of potential users, including the participants and collaborators, and most importantly local fishers.
- It is important to consider that participation in research is also negotiated through different community members; therefore their participation in activities where results are shared varies greatly in terms of the inclusiveness.

- An effective collaborative framework provides access through scientific manuscripts (Erisman et al. 2012), short reports with explanations of the main results, publications in a blog and maps printed for stakeholders.
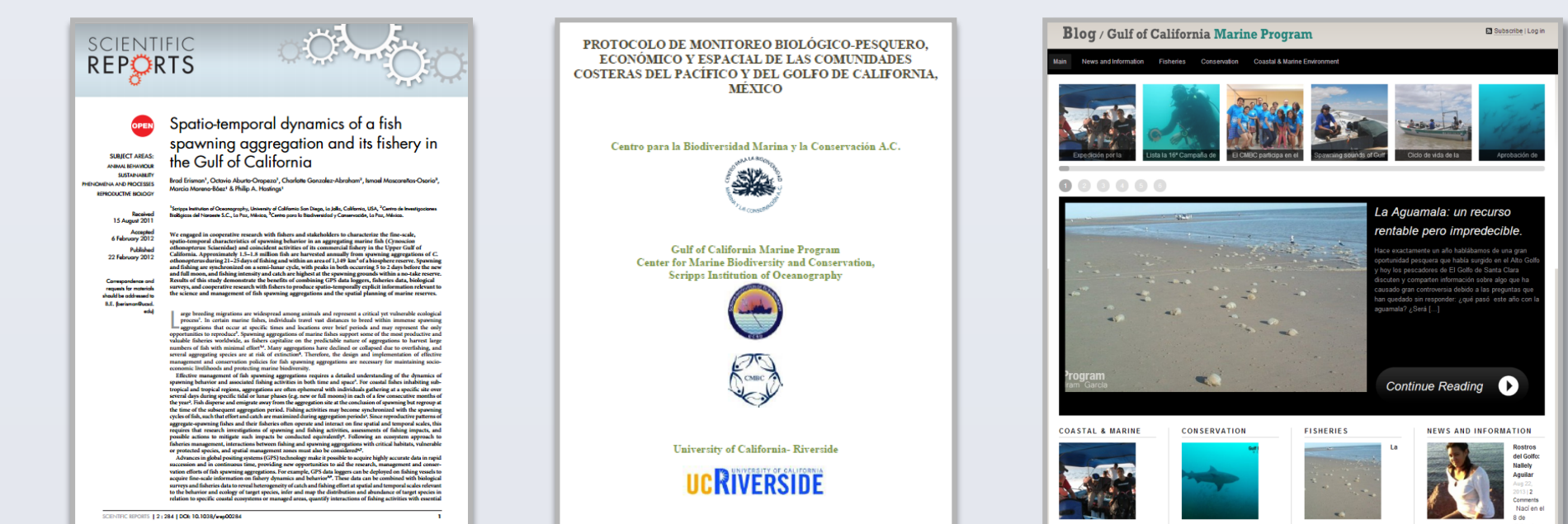
- The inclusion of spatial and temporal dimensions of fisheries is a key element for successful development of spatial zoning and marine spatial planning initiatives.
- Through the active participation of individuals, this framework offers a chance to engage with local contexts in a way that promise better understanding of the dynamics of human uses of natural resources.

REFERENCES

- Edwards, S. F., J. S. Link and B. P. Rountree (2004). "Portfolio management of wild fish stocks." Ecological Economics 49(3): 317-329.
- Erisman, B., O. Aburto-Oropeza, C. González-Abraham, I. Mascareñas-Osorio, M. Moreno-Báez and P. A. Hastings (2012). "Spatio-temporal dynamics of a fish spawning aggregation and its fishery in the Gulf of California." Scientific Reports 2(284).

Marcia Moreno-Báez, Post-doctoral Scholar
Center for Marine Biodiversity and Conservation
Scripps Institution of Oceanography, University of California San Diego. 9500 Gilman Drive, La Jolla, CA 92093-0202 8750 Biological Grade, Hubbs Hall
Email: mmorenobaez@ucsd.edu

www.PosterPresentations.com