



One People One Reef

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Collaborative Management
Solutions to Address Reef Health
and Climate Change Impacts to
Micronesian Outer Islands

An underwater photograph of a coral reef. In the foreground, there is a large, dense patch of pinkish-red coral. Below it, there are various other coral species, including some with rounded, brain-like shapes. In the background, a diver is visible, partially obscured by the water and coral. The water is clear and blue. A white, jagged, zig-zag line graphic runs along the left side of the image.

***“For it is true
that the Ocean unites
us and brings us together
but the Reef sustains us
in so many ways.”
-Sabino Sauchomal***

Our Vision

We are One People, One Reef.

Managing and conserving oceans in regions where people rely directly on the reefs for their livelihoods starts with an understanding of the problems, and of the cultural, historical and ecological context of resource challenges.

Our focus is the Yap outer islands. This vast archipelago has unique ecological and cultural resources, and engaging and supporting chiefs, leaders, reef owners and community members is critical to addressing food security and sustainable management as climate change presents new challenges. Outer islanders are serving as global leaders in this effort, and it is critical to support them and the 14 Atolls and associated coral reefs, stretching over 800 km of longitudinal distance into the Western Pacific , that they govern and manage.



Our Approach

OPOR combines indigenous traditions, knowledge and sciences with western sciences to collaboratively problem solve and plan for sustainable resource use and protection. It aims to support adaptive management backed by science. As many Pacific Island communities face the effects of climate change, it is a critical time to engage them in adaptive management planning. Collaboration and good stewardship are a match for the most difficult challenges. OPOR is a team of committed practitioners of collaborative research and marine scientists with expertise in ecology, genetics, behavior, education and sociology. Local leaders develop and implement the plans.

To support communities we

- Provide extensive ecological surveys of reefs and share findings.
- Develop and build capacity within these communities to monitor and manage their fish and reef resources locally by sharing knowledge and training local teams to gather data on fish catch.
- Provide data and genetic analysis to understand changes to fish and coral populations and to assess the efficacy of management practices the community develops.
- Provide a planning approach utilizing social and scientific data to help communities produce their own plans for the Outer Islands and region.
- Facilitate the exchange of information through meetings and workshops.

Executive Summary

One People One Reef is a collaboration between the outer island communities of Yap State, Federated States of Micronesia and a team of dedicated scientists. This project was formed at the invitation of the outer islanders who noticed a change in their reefs and the fish they catch to sustain their existence. These communities are on the front lines of climate change and are threatened by sea level rise, erosion and a changing food web, yet rely heavily on their reef resources.

It is a key moment in history to work with these communities. They autonomously govern and manage a vast area of coral reefs in one of the most biodiverse regions on the planet. We believe that the key to successful management and conservation in this archipelago can be found not from a new technology or innovation, but in their own history and traditions that have served them for millenia. What we can provide is knowledge about the effects of gear modernization, changes in resource extraction and changes in management on the resource and the habitat.

Managing and conserving oceans in regions where people rely directly on the reefs for their livelihoods must start with the people themselves. They are key to understanding reef declines and historical context, and the success of management efforts depends on their leadership. They need to be supported to develop and implement their own plans, not pre-determined ones.

Project Accomplishments

- We have characterized the reefs of Ulithi Atoll by benthic composition and fish community structure. These data are shared with the communities.
- We have worked with community members on all four inhabited islands of Ulithi to facilitate reef management plans.
- We have trained local science teams in fishery landings data collection methods. All four islands have designated local science teams that collect data - the largest database of its kind in the region.
- We have analyzed and shared results from landings data to inform managers.
- We have documented traditional practices, historical trends, and local knowledge of fishes and landings patterns.
- We have produced educational materials for schools and community members.
- We conducted a workshop on reef resource management with participants from 17 outer islands - the first gathering of its kind in the region.
- Our work has strengthened local capacity regarding reefs, fishes and resource management, laying the foundation for a framework for management planning and reef conservation that can serve as a model for the FSM.

Coral reefs around the world are currently suffering from multiple stressors, leading to a global decline that has been ongoing for decades. The status of coral reefs and associated fisheries of many remote island communities in the Western Pacific is not well known, yet these communities are on the front lines of critical habitat management and use, and they rely heavily on their reef resources.

Through extensive reef surveys, interviews, and community meetings, our work on Ulithi Atoll, Yap State, Federated States of Micronesia has provided information for communities to better understand and address these declines



We work with communities to help them develop and implement needed changes by sharing the ecological knowledge we acquire from the reefs, and by listening to what they have to say about their reef resources, the history of declines, and traditional management practices. This is an approach to empower communities to better understand and sustainably manage their reef ecosystems. Our project has three main approaches - all of them collaborative: community interaction and feedback, ecological data collection, and management planning.

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Community interaction and feedback. We seek to engage the community from the start and rely on them for information about the problems, the history, and their solutions. They inform us about the historical context of change, and provide us with data to help us ask the right ecological questions.

1. Assess community needs and problems around marine resources
2. Assess their management approach, what works and what does not
3. Understand traditional management approaches, and how they have changed
4. Understand the impacts of newer fishing technologies such as spear guns and small mesh nets
5. Share our knowledge with them – we create educational materials and give presentations to share the ecological data we collect

Ecological data collection: understand the ecological dynamics of the system. By collecting a variety of ecological data we can ask and answer questions about ecological patterns and responses of the system to various pressures. This in turn can help us determine which kinds of management approaches may be more effective, and allow us to share ecological findings with the community.

1. Conduct habitat assessments at key locations around the Atoll
 - a. Coral cover and morphology, and coral community structure
 - b. Algae cover
 - c. Other invertebrates
 - d. Reef complexity
 - e. Coral recruitment
2. Conduct surveys to assess fish species assemblages and biomass
3. Establish monitoring protocols with the community for on-going assessments, especially for fish landings
4. Monitor *Montipora* sp. (an 'invasive' coral of concern) and other 'species of interest/concern', such as sea cucumbers
5. Conduct genetic analyses

Management planning: We integrate the information we get from the community with what we 'see' on the reefs (our ecological data) to discuss strategies for adaptive management. We encourage as much traditional management as possible. We recognize the need to revive traditional management but also to integrate more modern issues (such as gear changes) into that management. We are advocating a role for science, benchmarks, and traditional planning. We rely on the community to come up with the final plan.

1. Meet with community leaders to discuss management options and approaches
2. Share the results of these discussions with the community
3. Discuss why these approaches might work, and how long it might take
4. Help the community with a data collection plan – such as fish landing data
5. Follow up surveys and data analysis to assess efficacy of the management



This approach empowers communities to understand the problems, and discuss options to address them. It does not impose a predetermined plan, and it does not ask them to sign on to a larger regional agenda. It treats each community as an autonomous unit, with its own set of needs and cultural context. We emphasize the need for communication between the islands, while recognizing their own structure for interacting and managing sites. Fishing jurisdictions can be complex. The people and community leaders are far better suited than we are to understand how communication needs to proceed around these critical issues.