

BRIDGING SCIENCE AND MANAGEMENT in the Pacific Remote Islands Marine National Monument

Shannon Boyle, Vanessa De Anda, Kara Koenig, Erin O'Reilly, and Monique Schafer

Faculty Advisor: Mark Buntaine | Client: National Oceanic and Atmospheric Administration (NOAA)



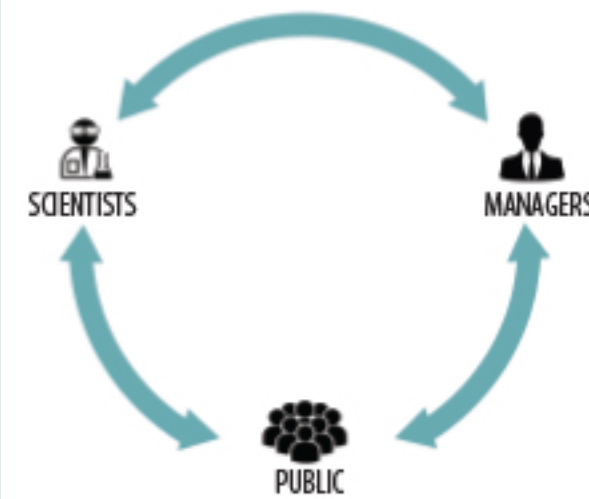
INTRODUCTION

The Pacific Remote Islands Marine National Monument (PRIMNM), one of the Marine National Monuments co-managed by NOAA and U.S. Fish and Wildlife Service, was established in 2009 and later expanded in 2014. Spanning the central Pacific, the seven islands protected under the Monument - Baker, Howland, Jarvis, Johnston, Kingman, Palmyra, and Wake - are relatively uninhabited and support intact and unique coral reef ecosystems. Although not subject to direct human pressures, the marine communities face threats from climate change.



Coral reefs at Palmyra Atoll, USFWS.

Since 2000, NOAA has conducted monitoring surveys in the PRIMNM spanning biological, chemical, and physical parameters. These data are used by scientists and managers to better understand coral reef ecosystem health. Due to the recent designation of the PRIMNM, the data collected was not synthesized prior to this project. The newly synthesized data will inform managers in their creation of a management plan. Agencies must foster effective communication between all stakeholders in order to successfully manage large-scale marine protected areas such as the PRIMNM. Therefore to better protect and preserve this Monument, it is important to have effective communication between scientists, managers, and the public. This study is an effort to bridge the gaps identified between all stakeholders.



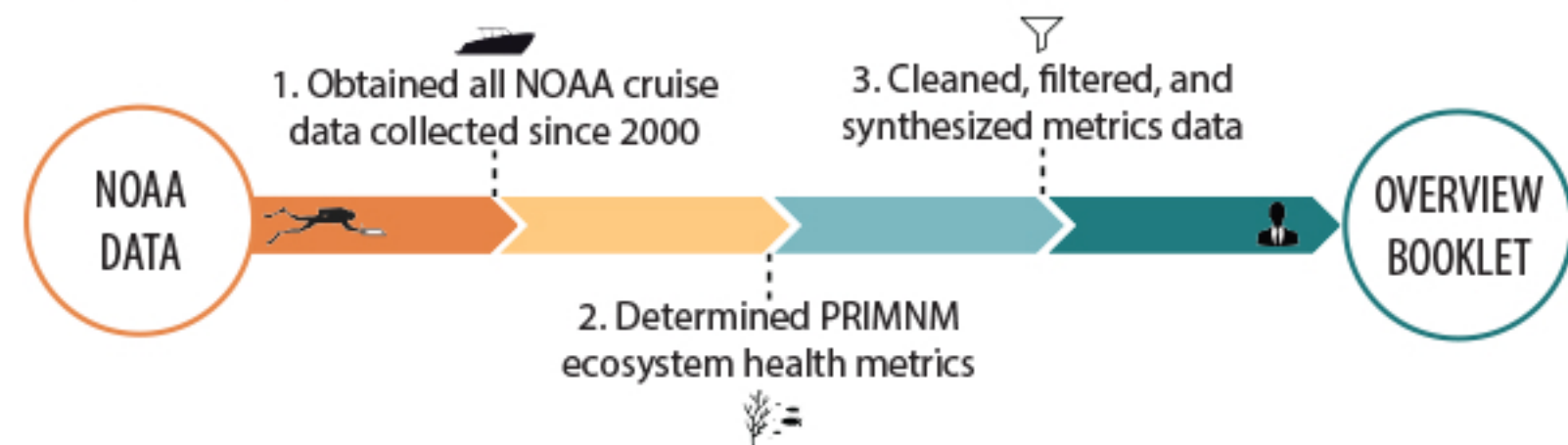
Objectives

Communicate ecosystem health to resource managers

Identify public perceptions and increase awareness of Pacific Marine National Monuments

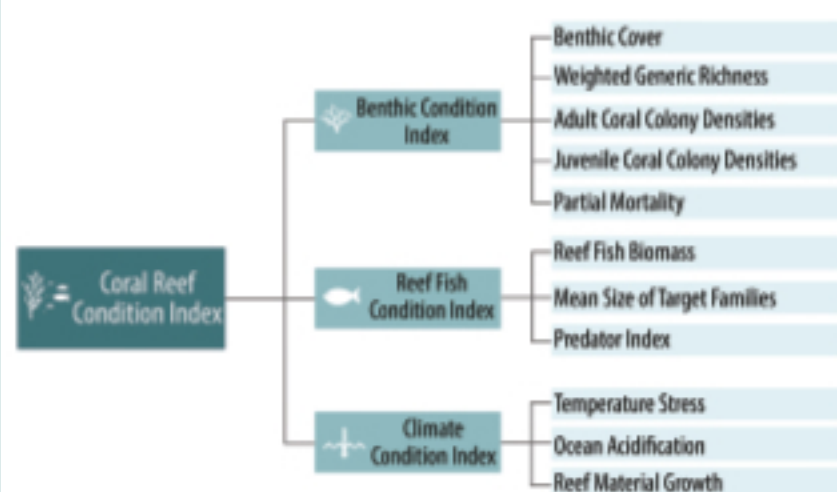
APPROACH

Overview Booklet



An overview booklet was created to communicate ecosystem health to PRIMNM managers. Three different levels of synthesis were conducted: Pacific-wide comparisons, Monument comparisons, and unique island highlights.

Coral Reef Condition Index



A multi-metric coral reef condition index was developed to better understand overall ecosystem health. Each metric was equally weighted.

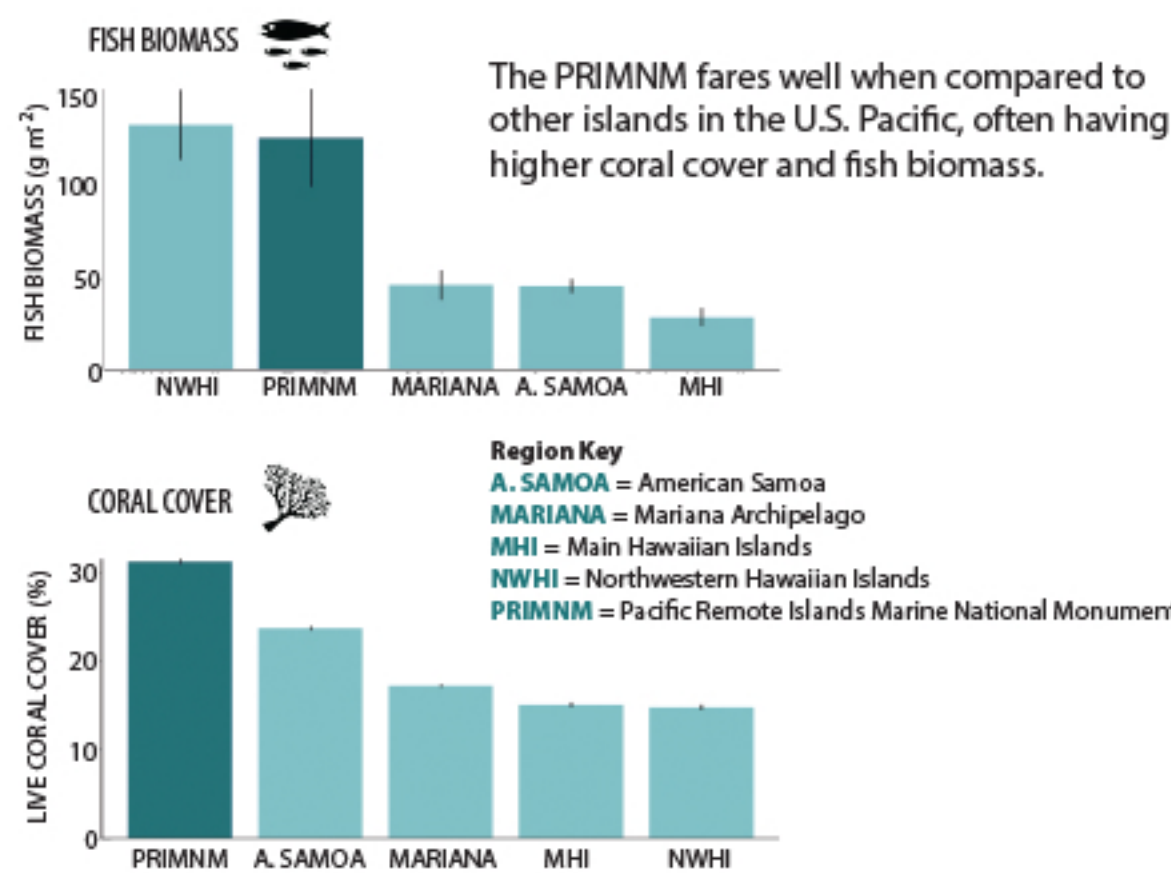
Survey



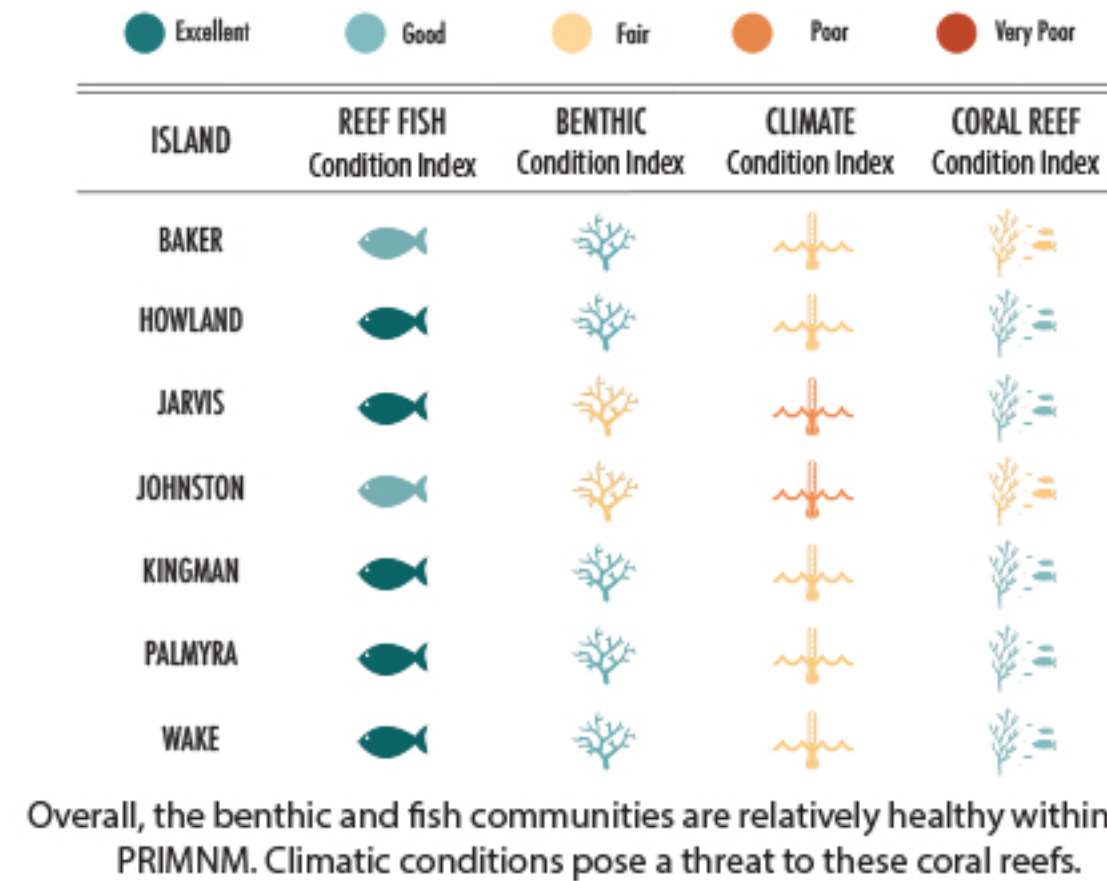
We distributed a 15 question survey to 763 respondents on SurveyMonkey to better understand the public's perception of marine conservation and threats facing our oceans.

ECOSYSTEM HEALTH

Pacific-wide Comparison

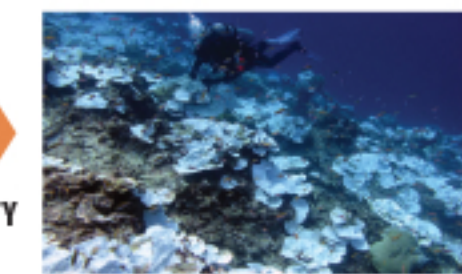
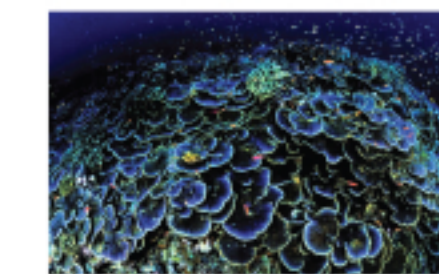
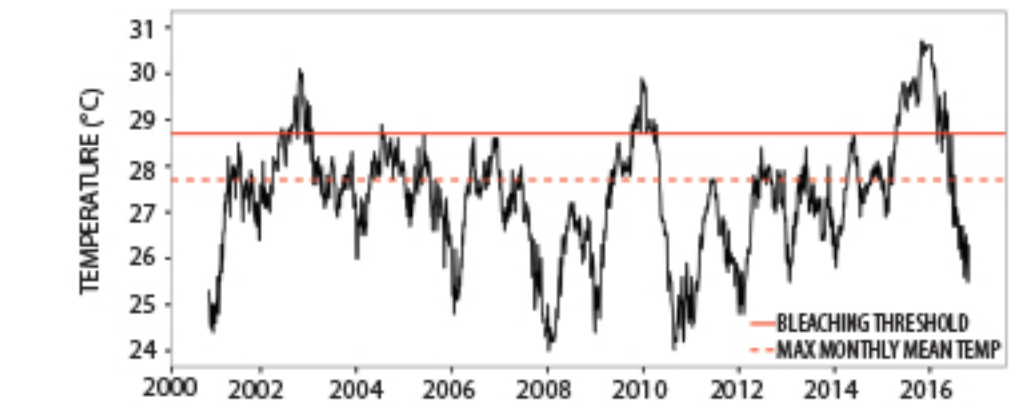


Monument Comparison



Island Highlight: Jarvis

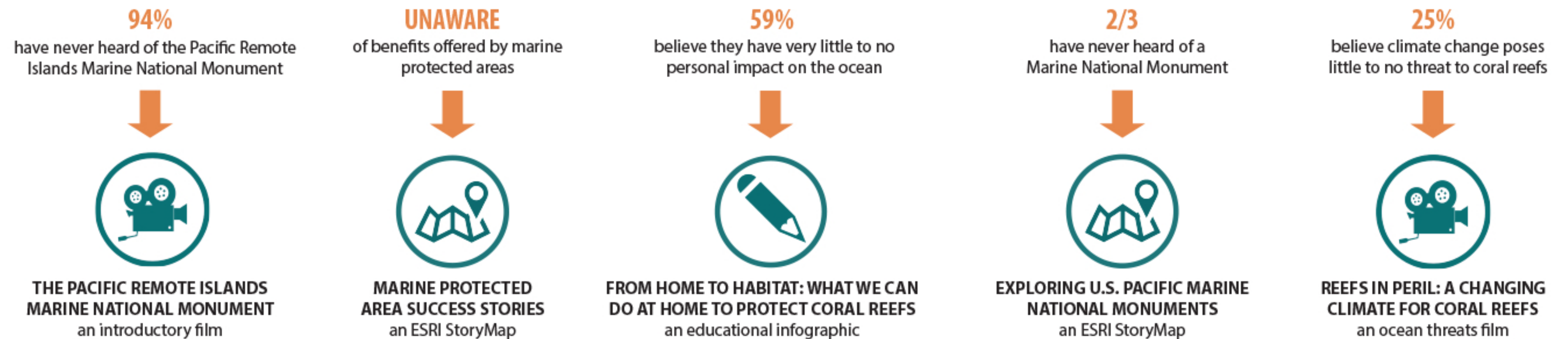
During the 2015-2016 El Niño, Jarvis surpassed the coral bleaching threshold for 43 consecutive weeks. This led to a 98% decrease in live coral cover.



98% MORTALITY

PUBLIC PERCEPTIONS

From our survey, we identified the public's baseline understanding of marine protected areas, threats our oceans face, and overall ocean health. Five communication materials were then developed to target the awareness gaps identified through survey analysis.



CONCLUSION

Our findings indicate that the biological communities within the PRIMNM are relatively healthy; however, climate change poses a threat. Our survey revealed that the American public is largely unaware of their role as a stakeholder in federal marine conservation in the Pacific. To effectively manage large-scale marine protected areas, such as the PRIMNM, it is essential for agencies to foster effective communication between scientists, managers, and the public. This will aid in the continued support for the PRIMNM and other critical marine habitats around the world.



Manta ray at Jarvis Island, NOAA.

ACKNOWLEDGEMENTS

There are many people who assisted and supported us in this project. We would especially like to extend our gratitude to our faculty advisor Mark Buntaine, PhD advisor Owen Liu, and everyone who worked closely with us at the National Oceanic and Atmospheric Administration, including Rusty Brainard, Tomoko Acoba, Ivor Williams, Adel Heenan, Bernardo Vargas-Angel, Dione Swanson, Thomas Oliver, Mariska Weijerman, Amanda Dillion, Samantha Brooke, Hokulani Ka'aeukuahiwi Pousima, Richard Hall, and Heidi Hirsch. In addition, we would like to thank our external advisors, including the U.S. Fish and Wildlife Service, Darcy Bradley, and Anne Walton.

FURTHER INFORMATION

For further information on our project and to view our communication materials, visit our website: www.primnmcoralis.weebly.com

To view the complete version of the overview booklet *Coral Reef Ecosystems of the Pacific Remote Islands Marine National Monument: a 2000-2016 Overview*, visit: www.pifsc.noaa.gov/cred/coral_reef_ecosystem_monitoring_reports.php