



MOSAICS IN SCIENCE

Diversity Internship Program

2021 Project Descriptions

NPS UNIT: WAR IN THE PACIFIC NATIONAL HISTORICAL PARK	PD #: 2021508
<p>Project Title: Assessing bleaching and water conditions on Guam's shallow coral reefs Position Type: Mosaics PLC Primary natural resource discipline: Biological Sciences Project keywords: coral reefs, corals, reefs, field biology, marine biology Location: Hagatna, Guam</p>	
COVID-19 NOTICE	
<p>As the COVID-19 pandemic continues to change and evolve, project timelines and structure remain flexible and it may be necessary to postpone start dates, begin work remotely, or reformulate the project's description. Should any development in the COVID-19 outbreak impair a project's timeline or results, the SIP Team will work with the park and project mentors to assess the situation and determine the best course of action at that time.</p>	
PROJECT DESCRIPTION AND WORK PRODUCTS	

Position Description: Coral reefs are in decline worldwide due to climate change. More than half of War in the Pacific NHP's lands are underwater, and much of this submerged and is home to coral reef communities. The park's coral reefs have been badly damaged and continue to be threatened by warming ocean waters, ENSO-related low tides, acidification, pollution, and overfishing. Widespread coral bleaching events in 2013, 2014, 2016, and 2017 caused massive mortality, particularly among shallow reef flat coral communities.

Reef restoration efforts within the park began in May 2019, when over 400 staghorn coral fragments were outplanted from a coral nursery to the shallow waters of the park's Asan Beach unit. These outplanted corals require regular monitoring, and during the bleaching season they may require additional care (such as installing shade clothes or removing algae). On Guam, bleaching season generally begins in late summer and lasts until winter, but bleaching can be caused at any time during the year by disease outbreaks, corallivores (such as the crown-of-thorns sea star), and low tide exposure. Tracking coral bleaching and water conditions throughout the year is imperative to understanding the overall health of Guam's reefs and the causes of coral bleaching. The park seeks an SIP Mosaics intern to assist with monitoring coral bleaching, particularly among outplanted corals, during the summer of 2021.

The SIP intern's primary duty will be to perform monthly coral bleaching surveys in order to track bleaching throughout the bleaching season. The intern will be trained to perform Coral Watch surveys, which involves identifying a coral's growth form and using a color-matching card to identify the darkest and lightest colors of an individual coral colony. Since 2015, park staff, interns, and volunteers have used Coral Watch methods to evaluate coral bleaching along permanent transects at three sites. Using the Coral Watch methods will allow the intern to compare 2021 bleaching data at these sites to data from previous years. The intern will also use Coral Watch methods to assess bleaching among outplanted corals at Asan Beach unit.

The intern will also assist with monitoring water quality conditions (i.e. temperature, light intensity, dissolved oxygen) on shallow reef flats using underwater data loggers. The intern will assist park staff with collecting data, adding data to the water quality database, and analyzing water quality data to generate trends and comparisons with bleaching data. The intern will also assist with various other natural resources activities, which may include monitoring *Tridacna* clam populations, quantifying coral recruitment, using CoralNet to identify benthic photos, assessing growth of outplanted coral colonies, outreach events, etc.

War in the Pacific NHP is tasked with conserving both the cultural and natural resources of our lands. Limited resources and reduced staff have resulted in irregular monitoring of our coral reef resources. Without sufficient data on the current health of our reefs, we will be unable to recognize improvements or declines in the future. The SIP intern's work will provide critical information on coral health within the park that may help determine where and when future coral outplanting can occur.

This position is offered through the National Park Service's Mosaics in Science Internship Program in partnership with Environment for the Americas.

Work Products: At the conclusion of the internship, the SIP intern will have conducted Coral Watch bleaching surveys on thirty permanent transects across three sites within the park for three consecutive months. The intern will have uploaded this data to the publicly available online Coral Watch database, and they will have generated reports on coral bleaching trends within the park. The intern will also have produced a set of monthly bleaching surveys for outplanted coral colonies at the park's Asan Beach Park unit, analyzed survivorship of colonies, and assisted park staff with bleaching mitigation efforts (such as deploying shade cloths).

NATURAL & PHYSICAL WORK ENVIRONMENT

War in the Pacific National Historical Park is located in Guam. The park encompasses both natural and cultural resources, with a focus on WWII history. Park headquarters are located in downtown Hagatna (the capital of Guam), conveniently near restaurants, banks, grocery stores, and shopping malls. Guam has modern amenities and the park is fairly urban. Guam has a tropical climate. Daytime temperatures generally range from 80-88°F, with high humidity and a wet season from July to November.

The intern will be based in the park headquarters with other natural resources staff. Fieldwork will be conducted on shallow reef flats, between 5-50 m from shore in water up to 3 m deep. All in-water fieldwork is conducted by snorkel, and water temperatures are generally warm, around 82-84°F. Strong swimming skills are required as currents can sometimes be strong; however, park staff do not enter the water in foul weather (e.g. lightning storms) or during marine weather warnings (e.g. high surf advisories). Rip currents have been known to form in the waters around Guam. Venomous animals, including cone snails, stonefish, and jellyfish, are occasionally encountered but pose little threat unless harassed. Sun exposure can result in serious sunburn so protective clothing (including gloves and UV-protective long-sleeve shirts) will be provided, as well as reef-safe zinc sunblock. The intern will also have the opportunity to assist with terrestrial fieldwork, including monitoring plants in the jungle and conducting hikes in the badlands.

QUALIFICATIONS

Candidates should have completed at least two years in a course of study at an accredited college or university leading to a bachelor's degree in biological science, natural resource management, or a related discipline. Strong swimming skills are required, and snorkeling experience (using a mask, snorkel, booties, and fins) is highly desired. Data entry experience or experience with Microsoft Excel is preferred. Minority applicants, especially Pacific Islanders, are encouraged to apply.

The applicant must be a U.S. citizen or U.S. permanent legal resident ("green-card holder") between the ages of 18 and 30 years old, or a veteran up to age 35. Prior to starting this position a government security background clearance will be required.

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VEHICLE AND DRIVER LICENSE REQUIREMENTS

Applicant must have a valid drivers license and a good driving record.

A personal vehicle is RECOMMENDED but not required for this position.

HOUSING

Park housing is NOT available. The intern will be responsible for finding housing in the nearby area. There is no park housing available. The ideal candidate will be a Guam resident, but if the applicant is not local, park staff will assist the intern in finding affordable housing and transportation. Furnished short-term housing is available for \$500-\$1000 per month.

INTERNSHIP START/END DATES

Start Date: 5/17/2021

End Date: 7/30/2021

Eleven weeks of the internship will be in the park. A mandatory Career and Leadership Workshop will be held in Washington, D.C. from August 1 – 5, 2020.

PLEASE DIRECT ANY QUESTIONS TO ENVIRONMENT FOR THE AMERICAS

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