

POSITION ANNOUNCEMENT:

FUTURE PARK LEADERS of EMERGING CHANGE

The National Park Service (NPS) is pleased to support the *Future Park Leaders of Emerging Change* (FPL) internship program as a pathway for exemplary students in higher education (advanced undergraduate students and graduate students) to apply their skills and ideas to park-based challenges and solutions. The program offers 12-week paid internships which allow students to gain valuable work experience, explore career options, and develop leadership skills through mentorship and guidance while helping to advance NPS efforts on emerging management issues. Successful students may be eligible for non-competitive hire into federal positions for which they qualify following completion of all academic requirements.

Assessing Conditions for Coral Reef Restoration

War in the Pacific National Historical Park/Natural Resources Division
Hagatna, Guam

PROJECT SUMMARY

Assess environmental conditions within shallow War in the Pacific (WAPA) coral reef waters for identification of potential coral restoration sites.

INTERNSHIP PROJECT BACKGROUND

Coral reefs are in decline worldwide due to environmental changes. Over half of War in the Pacific (WAPA) NHP's lands are underwater, and most of this submerged land is home to coral reef communities. Guam's attractive reefs serve to support its tourism economy and protect shorelines from storm erosion. Although containing the highest diversity of coral species among all US National parks, WAPA's coral reefs have been badly damaged and continue to be threatened by warming waters, ENSO-related low tides, acidification, pollution, and over-fishing. Without intervention, Guam's coral reefs may decline to the point of no longer fulfilling human needs for fisheries, tourism, and recreation. To this end, WAPA natural resources staff have collaborated with other local agencies, such as the University of Guam, to begin reef restoration efforts. In May 2019, nearly 500 coral fragments were taken from the NPS-funded, University of Guam-operated coral nursery and outplanted into WAPA's Asan Beach unit. Roughly 1.1 hectares of reef flat was restored, making this the largest outplanting project to date undertaken on Guam. However, more reef restoration effort will be needed to ensure the survival of Guam's coral reefs into the future.

INTERNSHIP PROJECT DESCRIPTION

Under the WAPA program of coral reef restoration, site selection is one of the most critical factors for outplanting success; corals may thrive at a healthy site, or experience total mortality at a poor site. Site

selection is typically based on in-water surveys of coral health, as well as water quality data when available. Park staff have monitored the coral reefs, especially on the shallow reef flats, for several years using a combination of survey techniques and underwater data loggers. In-water work is done while snorkeling using shore access and egress. SCUBA is not required. The underwater data loggers for temperature and light intensity have been deployed and regularly offloaded for several years, and this data allowed park staff and partners to identify the Asan Beach unit area as suitable for coral transplantation to support reef restoration.

However, much of the data generated by loggers has gone unused due to the staff time required to enter the data into a database, analyze the data, and generate reports. In addition, new loggers for oxygen and conductivity have been purchased but have yet to be deployed. Data from these loggers will help identify reef areas of high concern, as well as possible candidate sites for future coral transplantation. Identifying sites with cooler water and better oxygenation will be a priority for future reef restoration, and WAPA seeks an intern to assist with this effort.

The intern's primary task will be to assess water quality at several areas within WAPA waters and make recommendations for future potential coral reef restoration sites. The intern will join staff to deploy and collect data from several kinds of loggers, including temperature, light intensity, conductivity, and oxygen loggers. With the help of park resources staff, the intern will populate a database by entering new data from loggers, as well as backlogged data where available. Once the database is established and up-to-date, the intern will conduct basic analysis to generate site-specific reports of trends in water quality. If time allows, the intern will also assist park staff in conducting coral surveys using the line-intercept transect (LIT) method, which gauges live coral cover, species diversity, and coral health. Through this internship, the intern will gain in-water experience with a variety of field biology techniques, but will also get hands-on experience with the data entry and the analysis aspects of science.

The intern will also be given opportunities to gain a breadth of experience in related marine science activities. The intern may assist park partners with park-related projects such as monitoring transplanted corals at the reef restoration site or expanding a coral nursery. The intern may also attend local trainings, lectures, and meetings of conservation partnerships. The intern will have opportunities to engage the public in coral reef conservation and education through outreach events (such as the park's annual Reef Rangers youth summer camps) and workshops (such as WAPA's "make your own reef-safe sunblock" events). Other benefits to the intern include professional networking, experience working within the federal government, learning to use a variety of marine science tools (such as underwater data collection devices; marine still, video and fluorescence photography equipment; and marine epoxy).

War in the Pacific NHP is tasked with conserving both the cultural and natural resources on our lands, and without intervention WAPA's coral reefs are likely to continue to decline rapidly. Limited resources and staff time have resulted in irregular monitoring and backlogged data for our coral reef resources. The intern's work will provide a strong base for selecting sites for future coral reef restoration efforts within the park, and will also shed light on trends across time and sites.

Work Products: The intern will install new submerged loggers and update the water quality database to include all backlogged and newly-collected logger data, working with experienced staff. The intern will analyze trends by site, focusing on temperature and oxygenation, and write a report which presents the trends analysis, discusses the differences between sites regarding water quality and coral health, and provides recommendations for best sites for future reef restoration efforts. For product evaluation, the report will undergo a peer review process with WAPA staff, the NPS Inventory and Monitoring coral reef ecologists, and Guam partners of the Coral Reef Response Team.

QUALIFICATIONS

Narrative: The most qualified applicants will have or be pursuing an advanced degree in Marine Biology or related marine science. Knowledge of Pacific coral reef ecosystems and species and desire to increase such knowledge is a plus. Analytical and GIS skills and experience with database work are desired. Minority applicants, especially Pacific Islanders, are encouraged to apply.

- Two years of education toward bachelor's degree in marine biology or related discipline
- Knowledge of Pacific coral reef ecosystems and species
- Possess a valid driver's license
- Strong swimming skills are required, and snorkeling experience is highly desired
- Experience entering and analyzing large data sets
- Experience with Microsoft Excel and some ArcGIS

LEADERSHIP DEVELOPMENT

The intern will work closely with and learn leadership skills from NPS natural resources and interpretation staff and management partners from Pacific Historic Parks, the University of Guam, CZM, NOAA, and several Government of Guam agencies. These partners include professors, graduate students, biologists, outreach specialists, and biological science technicians. The park's integrated cultural and natural resources manager Mike Gawel, a marine ecologist with over 40 years of Pacific coral reef management experience, will be a volunteer mentor for this intern following his retirement from NPS in 2020 and continued volunteer work at WAPA. The intern will obtain experience in leading and in training high school level volunteers to engage in their leading younger participants in the annual WAPA Reef Rangers camps. The intern will also be able to attend meetings with local partners, such as the University of Guam and the National Oceanic and Atmospheric Administration, as well as multi-partner task force groups, such as the Guam Coral Reef Task Force, the Guam Reef Restoration and

Intervention Partnership, and the Guam Nature Alliance. The intern will present her/his project at the annual Guam Coral Reef Symposium, the island's annual conference for coral reef managers and scientists to share new research, tools, and ideas. The intern will also present at a public session of the WAPA Science Sunday talk series. These networking opportunities are not only good practice of an important professional skill, but also a chance to meet other natural resource workers and create connections for the future.

DATES OF POSITION

Approximate dates of internship: 05/18/2020 – 08/08/2020

Are dates Flexible? : Yes, internship may begin any time from early May to late June and if a short personal break is requested by intern and approved by supervisor and FPL Program, the remaining of the 12 weeks will continue after such break.

COMPENSATION

This initiative supports one student at \$16/hour for 12 weeks, or 480 hours.

HOUSING & TRAVEL

The FPL provides a travel stipend to all interns to supplement the cost of student travel to the park site.

Park housing is NOT available and the intern will be responsible for finding housing in the nearby area. The FPL provides a housing subsidy to the intern, when necessary. Guam is a small island with convenient access to all amenities. Furnished short-term rentals or apartment sharing with university students are options. If the candidate is not a local resident, WAPA staff will assist the intern with finding affordable housing.

A personal vehicle is RECOMMENDED but not required for this position. Guam has very poor public transportation and bicycles are not recommended for safety reasons. The intern will need a vehicle to get to work, grocery stores, and other life necessities.

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 capitol of Guam), conveniently near restaurants, banks, grocery stores, and shopping malls. As it supports over one and a half million tourists a year, Guam offers a huge variety of eating, entertainment and recreation opportunities. The intern will be based in the air-conditioned park headquarters office with other natural resources staff for the majority of work hours. Guam has a tropical climate, and temperatures daily range from 75° to 88° with high humidity. Guam is surrounded by coral reefs, and ocean waters average about 82° F. 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. 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 bothered or handled. 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 mineral sunblock. The intern will also have the opportunity to assist with terrestrial fieldwork, including monitoring plants in the rainforest and conducting hikes in watershed areas, emphasizing “Ridge to Reef” relations.

CONTACT INFORMATION

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