

**Performance Progress Report**  
**Developing the Pacific Islands Ocean Observing System (PacIOOS)**  
**Cooperative Agreement # NA16NOS0120024**  
**Performance Period: December 1, 2022 through May 31, 2023**  
**Submitted June 2023**

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This report covers activities conducted during the fourteenth 6-month performance period of what is now an 8-year cooperative agreement with NOAA’s approval of our second no-cost extension request. PacIOOS’ estimated operating budget for this reporting period including the first no-cost extension was \$3,884,594. (The operating budget for the second approved no-cost extension from NOAA IOOS is \$1,466,298.29.)

**I. Milestones**

<b>Milestone</b>	<b>Expected Completion Date</b>	<b>Status</b>
<i>Re-deploy, Majuro (RMI) Wave Buoy</i>	Spring 2023	Complete
<i>Deploy an array of oceanographic satellite tags on large pelagics in the Main Hawaiian Islands</i>	June 2023	In progress
<i>Run glider missions</i>	August 2023	Pending
<i>Deploy new wave buoys in the Freely Associated States</i>	March 2024	In progress
<i>Implement projects in the Pacific Islands Ocean Data Needs</i>	May 2024	In progress
<i>Conduct Outreach and Engagement and Build Capacity in the Insular Pacific</i>	May 2024	In progress
<i>Deploy new HFR stations on Saipan (CNMI) and Guam</i>	May 2024	In progress

**II. Progress and Accomplishments**

**ENGAGEMENT SUBSYSTEM**

**Conduct Outreach and Engagement and Build Capacity in the Insular Pacific**

*The PacIOOS liaison team has undergone some transitions during this reporting period. Long delays in identifying a liaison in Palau have finally been resolved as well, with two local*

*Palauan staff at the Coral Reef Research Foundation having agreed to share this role; paperwork will be finalized during the next reporting period. The liaison position for the Federated States of Micronesia (FSM) was also filled during this reporting period by staff from the Conservation Society of Pohnpei. The FSM liaison offers broad experience ranging from animal behavior tracking to support of a land-based weather station on Pohnpei's highest elevation.*

*During the previous reporting period, we noted an [engagement workshop](#) that had been conducted in the Commonwealth of Northern Mariana Islands (CNMI) by PacIOOS staff and liaisons. The report from that workshop was finalized during this reporting period and can be [accessed](#) via the PacIOOS website.*

*The Guam and CNMI liaisons in particular, supported valuable on the ground relationships for PacIOOS staff. Liaisons from both regions facilitated letters of support for grant proposals and contacts for congressional outreach. In April, the PacIOOS deputy director attended a conference on Guam and the liaisons from regions again helped to provide introductions and networking opportunities with local partners, several of which have led to commitments for new MOA partnerships and asset deployments in the region. Finally, the Guam liaisons have also helped to extend their influence to networking in the western FSM state of Yap, where PacIOOS is preparing to deploy a wave buoy.*

### **Implement one or more projects in the Pacific Islands Ocean Data Needs report**

*PacIOOS has gratefully received pre-approval from IOOS to submit a new subaward with ecoLOGIC to achieve the milestone attached to this funding. During this reporting period, PacIOOS and ecoLOGIC have finalized the subaward documents, which are now in final review by CIMAR and SOEST. We hope to submit these documents via an Award Action Request early in the next reporting period so that the work can commence and be completed on schedule.*

## **OBSERVING SUBSYSTEM**

### **Re-deploy, Majuro (RMI) Wave Buoy**

**Completed** March 2023.

*The wave buoy '163 Kalo, Majuro, Marshall Islands' was redeployed on March 20, 2023. The installation of a new generation Waverider (addition of current meters and air temperature sensors), mooring system, and anchor was successful due to the combined efforts of PacIOOS and the NWSO Majuro. Training for mooring assembly, boat loading, equipment deployment, and buoy functionality assessment was administered by PacIOOS with NWSO staff. While in Majuro, PacIOOS team members participated in meetings with NWSO meteorologist in charge Reginald White and MIMRA (Marshall Islands Marine Resources Authority) regarding buoy operations and future projects.*

### **Deploy new wave buoys in the Freely Associated States**

*Reliable bathymetry continues to be a significant challenge for this effort, but the team has been exploring creative options to identify suitable deployment sites in the locations to meet the wave data needs of the region.*

*PacIOOS director Melissa Iwamoto presented at and participated in the NOAA National Weather Service 2023 Pacific Region Managers Meeting in Guam in February 2023. It was a fortuitous opportunity to reconnect with NWS Managers and staff from across the entire Pacific Islands region, discuss priority needs for new wave buoys from a regional forecasting perspective, and provide PacIOOS modeling and capacity building updates and plans.*

*During the reporting period, the team worked to finalize preparations for wave buoy deployment in Pohnpei. A site was selected with the input of the stakeholders and partners in the north shore of Pohnpei, about 1.2 miles offshore North Point. The local bathymetry is suitable to moor a Waverider buoy, and the location is advantageous to capture a broad swell window from SW to SE. The Waverider buoy was set up and tested, the mooring system is being finalized. All equipment necessary for deployment is scheduled to ship by June 30, 2023. A vessel charter was secured for deployment and approved by the University of Hawai'i Marine Superintendent. A request for Pohnpei State permits was filed and is being processed.*

*Based on input from the NWS and limited available bathymetry, another new wave buoy site was identified and proposed by PacIOOS to local partners in Yap. Discussions and logistical arrangements will continue during the next reporting period.*

*An area of about 1 by 1 mile SE of Kosrae island was identified as a potential wave buoy site. Due to the lack of bathymetry data, a bottom survey will be conducted by PacIOOS with single beam equipment during the next reporting period. A vessel charter was secured and documents are being gathered for approval by the University of Hawai'i Marine Center.*

*During this reporting period, the team has also continued to support our local partners to identify an additional suitable location for a wave buoy in the Marshall Islands that was purchased with funds from UNDP.*

### **Deploy new HFR stations on CNMI and Guam**

*PacIOOS has HFR systems for Guam and CNMI fabricated and ready for shipment to the region. Due to various challenges with site selection and last year's development of a larger U.S. military presence on Guam, PacIOOS has yet to move forward with HFR shipping or deployment. Additionally, the recent deleterious impacts of Super Typhoon Mawar has added logistical and prioritization concerns for our partners in the region. Thus, the goal is to continue working with the U.S. military and other landowners in the region to identify appropriate locations for the HFR systems on Guam and Rota.*

### **Run glider missions**

*PacIOOS Seaglider SG523 ran its first mission in almost 10 years from February 02 to May 10. The goal was to directly measure the seasonal phytoplankton blooms that occur off the Maui Nui island group, as modeled in the Hawai'i Regional Ocean Modeling System (ROMS) output. Piloted by PacIOOS Operations Coordinator, Chip Young, with technical assistance from Steve Poulos (University of Hawai'i), the seaglider completed 436 dives to approximately 900 meters depth. Each dive collected data on salinity, temperature, dissolved oxygen, and three fluorometry*

wavelengths throughout the water column. When the seaglider surfaced, data was transmitted via satellite communication, assimilated into the PacIOOS data systems, and incorporated into the ROMS.

Unfortunately, the seaglider experienced catastrophic humidity warnings after dive 436 and we lost communications. Based on the data collected, we believe that something punctured the seaglider, letting water in, and the seaglider sank. We were not able to recover SG523.

PacIOOS has begun discussions with SCOPE Principal Investigator Dr. David Karl from UH to potentially take over the maintenance and piloting of four seagliders. Discussions have also begun with Dr. Scott Glenn at Rutgers regarding the potential to utilize data from these seagliders to enhance tropical cyclone track and intensity forecasts. We hope to finalize the discussions on this equipment transfer during the next reporting period.

### **Deploy an array of oceanographic satellite tags on large pelagics in the Main Hawaiian Islands**

Four of the most recent generation of “bathygraph” satellite-linked ocean profiling tags have been received from the manufacturer for beta-testing. These will be deployed as soon as weather conditions allow on tiger sharks off O‘ahu.

### **III. Problems and Challenges**

Continued technical glitches with the profiling animal tags significantly delayed delivery of the next generation of “bathygraph” tags. Upcoming deployments will evaluate whether these have been resolved. All indications are that the problems have been resolved.

### **IV. Budget Summary**

Spending for this award is on track with projected program expenditures. The University of Hawai‘i Office of Research Services submitted a semi-annual financial report for the period ending March 31, 2023, through Grants Online. That report shows total receipts of \$14,098,539.93. As of June 1, 2023, internal budget tracking shows expenditures of \$14,197,112.47, representing a drawdown of 93.03% of the federal funding for this award.