Progress Report Submitted July 2024

Empowering Ocean Stakeholders: Advancing the Pacific Islands Ocean Observing System (PacIOOS) Award no. NA21NOS0120091

Period of Activity: January 1, 2024 – June 30, 2024 Principal Investigator: Melissa Iwamoto

I. Project Milestones

Milestone	Status	7/1/23 – 12/31/23	1/1/24 – 6/30/24
GOVERNANCE AND MANAGEMENT SUBSYSTEM			
Maintain NOAA certification	Ongoing		
Hold annual Governing Council meetings in HNL	Complete		
Hold annual ExCom meeting outside HNL	Planned		July 2024
Partnerships to promote & enhance ocean observing in the region	Ongoing		
Hire communications specialist	Complete	Q2	
OBSERVING SUBSYSTEM			
HFR stations; data online & assimilated into ROMS	Ongoing		
Site selection and permitting for HFR in the Mariana Islands - in collaboration with UOG subaward	In progress		
Maintain 18 wave buoys across region; data & products online	Ongoing		
Deploy new King-Poloa wave buoy in American Samoa	Complete		
Transition new wave buoy team staff	Complete		
Honolulu Pier 1 Weather Station	Ongoing		
Waikīkī Beach Camera	Ongoing		
Deploy new water parameter instruments (CTD and ADCP) in Guam; data online - subaward with UOG	Delayed		
Long-term WQ sensors (9); data & products online	Ongoing		
WQSPP sites and services; data and products online	Ongoing		
Pilot project with Turner C3 fluorometer and optical sensors	Ongoing		
WQ coastal moorings (2); data / products online	Ongoing		
Undergraduate mentoring/capacity building w/ moorings	Ongoing		
Install acoustic receiver for shark ID on existing Hilo WQ mooring	Delayed		
Generate near real-time ocean profiles with animal tags	Ongoing		
Establish efficient data dissemination for animal tag profiles	On track		
Maintain land-based "mote" stations for animal tag data collection	Ongoing		
Capacity building for Insular Pacific animal tagging	Ongoing		
Build capacity in regional communities for ciguatera sampling	Ongoing		
Baseline sampling in targeted locations for ciguatera	Ongoing		

Atmospheric models (HI, Mariana Is., Samoa, RMI, Palau, FSM.) Ongoing Upgrade atmospheric models Ongoing Generate model output statistics for Palau Complete Existing wave forecasts (HI, Mariana Islands, Samoa) Ongoing Develop, implement, validate unstructured SWAN grids for HI On track New wave model forecasts for the freely associated states On track Develop, implement, and validate unstructured grids for Guam and CNMI wave forecast system Ongoing Hale'twa Harbor Surge Forecast Ongoing Ongoing Develop meth Chahulu Harbor Surge Forecast (BOS2) Ongoing Ongoing Develop and Oploy Westem Pacific ROMS Complete Expanded HI ROMS model Develop PaciOOS ROMS climate survey On track Develop actional ROMS server and software stacks Delayed Develop new High(er) Resolution ROMS Forecasts for HI On track Develop new High(er) Resolution ROMS Forecasts for HI On track BOSZ wave run-up forecasts (HI, RMI) Ongoing Deselop expelop reverses Delayed BOSZ wave run-up forecasts (Honoluu, Palau) On-track Delayed Delayed High sea level forecasts (fron chulu action services Ongoing	MODELING AND ANALYSIS SUBSYSTEM			
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Archive regional acoustic telemetry datasets in PIRAT database Ongoing	Build capacity for acoustic telemetry studies via workshops and Ocean Tracking Network equipment loan program	Ongoina		
	Archive regional acoustic telemetry datasets in PIRAT database	Ongoing		

ENGAGEMENT SUBSYSTEM				
Communications & engagement across the region (hybrid & via local liaisons)	Ongoing			
Expand capacity sharing to include virtual meetings/webinars	On track			
Regional tech transfer & capacity sharing—subaward with MERIP	Ongoing			
Conduct one-on-one partner meetings to develop ciguatera network	On track			
Develop ciguatera network and stories online	On track			
Engage partners in cross-regional collaboration to learn from ciguatera research outside of the Pacific	Ongoing			
Ciguatera internship program at American Samoa Community College	Delayed			
Conduct regional engagement on ciguatera network	On track			

Shaded cells represent periods during which the activity is expected to occur. Text in a shaded column indicates the period during which the activity was completed or if the activity is delayed, the period during which the activity is expected to occur.

II. Progress and Accomplishments

A. Core funding update

Amount	Funding Area	Task
\$8,867,036	Core	Sustained operational funding and service delivery. Allocations to HFR include Year 1: \$331,540; Year 2: \$346,263; Year 3: \$414,239

High-Frequency Radars (HFRs)

PacIOOS is working with USFWS on permitting to replace a fence around the Kalaeloa station and operations staff are exploring multiple source options to optimize cost.

In previous versions of this report, we described recapitalization needs for project components including data servers and the HFR service vehicle. We have removed these needs from the table below, as IOOS funds have been obtained through the BIL and those recapitalization activities will be reported under that award.

Existing and planned HFR stations	Status	Recapitalization needs
KAK (Kakaako)	System upgrades / repairs performed. System operating as planned with data transmitted to CORDC.	
KAL (Kalaeloa)	System upgrades / repairs performed. System operating as planned with data transmitted to CORDC.	PacIOOS is working with USFWS to permit a replacement fence for this site.
KAP (Kapolei)	System upgrades / repairs performed. System operating as planned with data transmitted to CORDC.	
KKH (Keaukaha)	System operating as planned with data transmitted to CORDC.	
KNA (Ka'ena)	System operating as planned w/ data transmitted to CORDC.	
KOK (Koko Head)	System upgrades / repairs performed. System operating as planned with data transmitted to CORDC.	
PPK (Pepe'ekeo)	Awaiting system maintenance.	
Ritidian, Guam (planned)	Tx and Rx locations were scouted in January / February 2024. Several candidate locations were identified at Andersen Air Force Base. Installation proposal is under development.	N/A
Rota, CNMI (planned)	Tx and Rx locations were scouted in January / February 2024. A candidate location was identified on private land. Installation proposal is under development.	N/A

* Regarding planned antenna calibrations: LERA HFR systems rely on antenna phase, not amplitude measures, and are extremely stable once cable and filter calibrations are performed,

which is done at the time of installation. Extensive calibration exercises were conducted at KOK, KNA, KAK, and six other LERA systems globally; none required any processing correction. A reassessment of amplitude and phase for each system is anticipated to be done upon installation of upgraded/recapitalized component hardware.

Gliders and Other Uncrewed Systems (UxS)

Summary of glider activities over the reporting period: Please see the June 2024 progress report for PacIOOS Award# NA23NOS0120077 and the final report (to be submitted in fall 2024) for Award# NA16NOS0120024 for updates on glider expenses and calibrations.

Preparations are underway for two concurrent glider missions beginning in July 2024, which will be reported under PacIOOS Award # NA23NOS0120077 and in the next iteration of this Award's semi-annual reporting.

Other Core Observation Activities

Governance and Management Subsystem

Summary: PacIOOS had a busy reporting period developing IRA proposals, preparing for BIL proposals, conducting extensive outreach to stakeholders on behalf of the IOOS Association, preparing for new HFR sites, and expanding our engagement efforts.

- The PacIOOS team held numerous meetings with regional and national partners (e.g., National Marine Sanctuaries, UH Sea Level Center, National Geodetic Survey, National Weather Service) focused on potential collaborations under the IRA. Even though not all of these meetings led to IRA proposal activities, they led to potential future collaborations and relationships that further the NOAA, IOOS, and PacIOOS missions in the long-term.
- PacIOOS deputy director accompanied the HFR project lead for a site scouting and partner relationship trip to Guam and Rota Islands. Additional meetings for wave buoys and partner engagement were conducted on Saipan Island.
- PacIOOS director, deputy director, and governing council chair participated in the IOOS spring meeting in Washington, D.C.
- A contract was renewed for liaison services in the Federated States of Micronesia (FSM) and a partnership for improved capacity building around ocean observing was expanded with The Ocean Foundation and the Global Ocean Monitoring and Observing office. This Pacific Partnership has included efforts from the PacIOOS management, engagement, and buoy teams.
- PacIOOS hosted Dr. Spinrad in Honolulu for a demonstration of PacIOOS data services and engagement, including presentations by several stakeholders and modeling team leads.

Delays with the university's Office of Research Services, compounded with those from the eRA Commons system at NOAA have postponed the receipt of awards, approval / initiation of subawards, and general operational efficiency. These delays have been particularly problematic for purchasing and personnel costs associated with subawards and services contracts, especially our local liaisons, within those awards. Administrative staff within CIMAR at UH helped to overcome some of these delays and some of the backlogs were overcome during this reporting period.

Observing Subsystem

Summary: This reporting period saw a number of successes for the wave buoy team in addition to a high level of asset uptime, growth of the Pacific Islands Regional Acoustic Telemetry (PIRAT) node, and preparations for new asset deployments (including glider missions) in 2024.

- Five <u>nearshore sensors</u> in Hawai'i (4 O'ahu, 1 Maui), and 2 additional sensors in the Insular Pacific (American Samoa, RMI) operated successfully.
- The wave buoy team continued to maintain and operate the existing PacIOOS <u>array of</u> <u>wave buoys</u> in the Hawaiian Islands, Guam, CNMI, American Samoa.
- Wave buoys were redeployed off of Kaua'i, Lāna'i, Hilo, American Samoa, and Guam.
- The PacIOOS team worked with the government of Palau on procurement of a new wave buoy (i.e., they are purchasing a wave buoy with their funds and PacIOOS is helping them with their procurement and ultimately, PacIOOS will deploy and maintain the buoy using core funds).
- New wave buoys were deployed off of American Samoa and Yap, FSM.
- The wave buoy team conducted training with federal and local and merchant mariners in American Samoa to demonstrate a valuable partnership that successfully deployed two wave buoys without a PacIOOS team member on the vessel. See Success Story in this report.
- The wave buoy team hired a full-time and a temporary wave buoy technician.
- The wave buoy team completed a bathymetry survey off of Kosrae, FSM, in preparation for a new buoy deployment there.
- Two water quality coastal moorings were maintained on Hawai'i Island.
- The Waikīkī beach web camera was remounted and leveled to ensure safety. The camera provides regular imagery, operationally, for shoreline managers and as one of the pilot cameras for WebCOOS.
- The MAPCO2 buoy in American Samoa is operating and transmitting data through continued partnership with the National Marine Sanctuary of American Samoa and the Pacific Marine Environmental Lab.
- The Shark Lab at the Hawai'i Institute of Marine Biology deployed 2 beta oceanographic tags on tiger sharks off O'ahu.
- The HFR team hired a full-time technician.

- Supply chain and engineering issues at the manufacturer have slowed expansion of shark tagging efforts.
- The wave buoy team experienced challenges from weather, personnel availability, electronics / equipment malfunctions, ageing infrastructure, and logistics that delayed deployment and redeployment of wave buoys.
- Staffing challenges in the FSM have stalled operations of the nearshore sensor deployments there.
- Delays with the eRA Commons transition and the University of Hawai'i Office of Research Services led to postponed approval of subawards, impacting observation / data collection and the hiring of a HFR technician in Guam.
- Wider (worldwide) distribution of ocean depth/temperature profiles remains hampered by technical difficulties at the Animal Tracking Network Data Assembly Center. Efforts are underway to address these issues.
- Planned deployment of acoustic receivers on the TAO array was postponed indefinitely on account of NOAA refurbishing the TAO buoy array.

Modeling and Analysis Subsystem

Summary: PacIOOS modeling teams maintained a suite of their more recently expanded model domains while also preparing computational infrastructure for future expansions.

- Maintained WRF (atmospheric) forecasts of <u>wind</u>, <u>rain</u>, and <u>air temperature</u> for Hawai'i, Mariana Islands, Samoan Islands, and the western Pacific, with ongoing model upgrades. These model outputs were served to the NWS AWIPS system.
- Two new PhD students were accepted to work on regional WRF models and climate downscaling.
- The 7-day <u>wave forecasts</u> (WaveWatch III and SWAN) were maintained to provide daily wave forecasts for Hawai'i, Mariana Islands, and American Samoan Islands.
- Tested and validated the CNMI & Guam Unstructured SWAN 14-day forecast with buoy measurements.
- Completed the preliminary development of the Palau unstructured wave forecast grid.
- Maintained the <u>ROMS circulation models</u> for Hawai'i, Mariana Islands, Samoan Islands, and the western Pacific.
- Maintained the <u>Ala Wai Turbidity Plume forecast</u>.
- Maintained the <u>6-day high-water level forecasts</u> in Hawai'i, Palau, Guam, and American Samoa.
- Maintained the <u>wave run-up forecasts</u> for O'ahu, West Maui, and the RMI.
- Maintained the <u>Hale'iwa Harbor Surge forecast</u>.
- The wave-driven coastal processes group hired a new research specialist and a part-time web / data specialist.
- Expanded the suite of BARRACUDA-derived improvements of BOSZ coastal process.
- Continued BOSZ evaluation for Kahului Harbor surge models.

- Reliance on international organizations to support sensors can negatively impact PacIOOS data tools. For example, the water level gauge at Uliga Dock in Majuro, RMI, is maintained by the Australian Bureau of Meteorology, which removes control over maintenance issues.
- Delays in IT procurement and installation of new servers has also delayed forecast expansions for WRF and ROMS.
- Personnel shortages and associated administrative delays have challenged both the wavedriven coastal processes group and the WRF group.
- File format changes from remote data providers led to short-term outages of wave-driven coastal processes models (e.g., wave run-up and high sea level forecasts).

Data Management and Cyberinfrastructure (DMAC) Subsystem

Summary: PacIOOS DMAC infrastructure and data services were maintained, and we continue to operate as a Regional Data Assembly Center (DAC) for the Pacific Islands. The PacIOOS DMAC team continues to collaborate with other PacIOOS technical teams to provide necessary DMAC services, develop products, and address stakeholder and partner DMAC needs.

- Maintained <u>management</u> of PacIOOS collected data and model forecasts via GeoServer, ERDDAP, TDS, and Voyager.
- All data appropriate for long-term archive are being sent to NCEI on a regular basis.
- Successfully completed the semi-annual data push via the <u>Pacific Islands Regional</u> <u>Acoustic Telemetry (PIRAT) Node in February</u>.
- During this performance period, over 15 TB of data were accessed via PacIOOS TDS and ERDDAP servers.
- PacIOOS worked with partners in Palau to ingest weather station and salinity probe data; efforts are ongoing.
- The PacIOOS management and DMAC team are serving an advisory role with the Palau Office of Climate Change and their efforts to develop a website and Palau data portal.
- Through the RODSI, a <u>new website and data portal</u> were launched for the Hawai'i Coral Bleaching Collaborative.
- The PacIOOS RODSI team led a hybrid data management and metadata workshop in Honolulu for groups monitoring the environmental impacts of the Maui fires.
- PacIOOS staff has continued to explore use of Amazon Cloud Services for website backup and data system support.
- New data management support provided through RODSI is working with partners to develop automated data processing and archiving routines for low cost sensors (e.g., temperature loggers).
- Staff continue to work towards integration of Backyard Buoys Spotter Buoys into the PacIOOS ERDDAP and other data services to meet broader stakeholder needs.

- As new grids (including unstructured grids) are developed by our modeling teams, the DMAC team will have to work to handle and integrate the data in new ways, including having a full understanding of and sufficient capacity for storage needs.
- The DMAC lead continues to fill the role of system administrator in the absence of fulltime support for this role.

Engagement Subsystem

Summary: Outreach and stakeholder engagement with partners is ongoing via email, phone calls, video conferences, and increasingly in-person activities. Increased staff capacity has supported more outreach events and preparations for more engagement in the forthcoming reporting period.

- PacIOOS brought on one new liaisons for FSM and renewed existing liaison contracts. The liaison program continues to be a critical component of the program.
- PacIOOS continues to publish and distribute monthly e-newsletters to a total of 2,815 recipients, with a 51% open rate. Highlighting PacIOOS data users and their specific use cases helps to illustrate the breadth of our stakeholders.
- During this reporting period, the PacIOOS website was visited by nearly 80K unique visitors and had more than 330k page views.
- PacIOOS' Facebook page has more than 1,600 likes and 1,700 people following the page; PacIOOS Twitter has more than 600 followers.
- PacIOOS established more regular social media efforts during this reporting period.
- Cross-regional partnerships for ciguatera studies were solidified through co-hosted inperson meetings and data collection workshops in the RMI and Hawai'i in February 2024. A week-long training with colleagues from the Marshall Islands Marine Resources Authority, Marshall Islands EPA, Marshall Islands Ministry of Health and Human Services, and Marshall Islands Conservation Society covered general ciguatera poisoning info, human health data collection, sample processing, and microscopy, followed by a student-focused one-day workshop in Hawai'i.
- Two undergraduate students from American Samoa were recruited to the ciguatera seafood poisoning project.
- Hiring for the ciguatera network coordinator position is underway.
- Continued capacity building of undergraduates with the Hawai'i Island water quality moorings.
- Continued community outreach in South Kohala and Kailua-Kona for water quality buoys off Hawai'i Island.
- PacIOOS engagement staff continue to be part of the IOOS Association DEIA Committee.
- School presentations on wave buoys in the FSM (March) sparked conversations about internship opportunities for students in ocean observing with NOAA and The Ocean Foundation.

- A fisheries technician from Guam traveled to Hawai'i for intensive training in telemetry systems and shark capture and tagging. This is a critical element of capacity building because he will manage the shark tagging project in the Marianas Islands.
- PacIOOS RODSI staff met with regional partners in Guam and the Northern Mariana Islands during the PRiMO Meeting (Saipan) and the Conference on Island Sustainability (Guam).
- PacIOOS teamed up with the NOAA CoastWatch program to co-host the CoastWatch satellite course targeted specifically towards partners in the Western Pacific region. This was a first time for the course to be taught specifically to the region and is already planned to be repeated as an in-person conference in the region this fall.
- PIRAT began assembling an advisory panel to maximize regional impacts.
- A Pacific Ciguatera Network (PCN) <u>website</u> has been developed to highlight information about ciguatera and the PCN, partners, resources, links to a Pacific-wide survey, and contact information.
- PacIOOS participated in additional outreach and education events at the Waikiki Aquarium (Whale you be my valentine?), the Bishop Museum Science and Sustainability Festival, Pōkai Bay Outreach Festival, and the Fisher's Forum.

- The eRA Commons transition postponed approval of subawards, leading to delays in several program components, including numerous aspects of RODSI regional engagement activities.
- Changes to Google Analytics created discontinuities in our monitoring of long-term web traffic.

IOOS, NOAA, Other Agency Funding			
Funding amount spent	Funding area /	Task	
	recipient		
Provided: \$738,604	Regional Ocean	Task: Regional Ocean Data Sharing	
(total for FY21 + FY22	Partnership	Initiative (RODSI)	
+ FY23)		Status: Delayed, but getting on track.	
		Accomplishments: In 2022, ecoLOGIC, LLC	
		(consultant) compiled <u>recommendations</u> for the	
Spent + Encumbered:		region. A major conclusion was the need to hire a	
\$239,338		data management specialist and a web and products	
		developer to build a geospatial data portal that	
		connects the Pacific region. Both positions are now	
Remaining: 68%		hired and the staff have made progress on several	
		regional priorities, including the development of	
		centralized data hubs for <u>environmental monitoring</u>	
		for the Lahaina (Maui) wildfires, decision support	
		tools for the Lahaina rebuilding effort, and the data	
		management and web development for the Hawai'i	
		Coral Bleaching Cooperative. The PacIOOS RODSI	

B. *Non-core funding update*

		team also led a data management workshop for
		nartners monitoring Maui fire impacts
		Maanwhile, through a subaward with agal OGIC
		LLC analinainant discussions around next stone for
		LLC, preliminary discussions around next steps for
		RODSI are underway, as are initial planning for a
		scoping workshop, likely in American Samoa.
		Issue (if any): The subaward with ecoLOGIC, LLC
		was not approved until May 2024 so activities from
		this component are delayed.
Provided [.]	Harmful Algal	Task: To further HABS understanding and
\$530,000 (EV22 +	Blooms (HABs)	prediction via a pilot project to support coordination
5350,000 (F122 +	Dioonis (IIADS)	hetween regional states alders and experts from
F Y 23)		between regional stakenoiders and experts from
		other regions who are actively involved in
		addressing ciguatera fish poisoning (CP).
Spent + Encumbered:		
\$126,279		Status: On Track
		Accomplishments:
Remaining: 76%		• Two undergrad research assistants from
		American Samoa were recruited. One student
		(Talofa Fe'a) is at UH Mānoa; the other student
		(Kenicia Godinet) began at American Samoa
		Community College and continued through her
		transfer to UH Hilo in Spring 2024. Fe'a will
		focus her undergrad Honors thesis on ciguatera
		poisoning in American Samoa.
		• Institutional Review Board (IRB) approval was
		obtained for:
		• a Pacific-wide CP survey that will be
		distributed and accessible through the
		PCN website.
		o interviews (Summer 2024 by Fe'a) with
		fish consumers and fishers in American
		Samoa, Fe'a will be co-mentored by
		Nalley and Val Brown in a NOAA
		EPP/MSI internship with the National
		Marine Sanctuary of American Samoa.
		Cross-regional partnerships were solidified
		through co-hosted in-person meetings and data
		collection workshops in the RMI and Hawai'i in
		February 2024. Nalley. PacIOOS liaison Andrew
		McInnis, and Dr. Alison Robertson (NSF
		CiguaPIRE project) led a week-long training with
		colleagues from the Marshall Islands Marine
		Resources Authority, Marshall Islands EPA
		Marshall Islands Ministry of Health and Human
		Services, and Marshall Islands Conservation

	Society that covered general CP info, human
	health data collection, sample processing, and
	microscopy, followed by a student-focused one-
	day workshop in Hawaiʻi.
	• Preliminary data collection is planned for
	American Samoa in partnership with the National
	Marine Sanctuary of American Samoa. This will
	be led by Fe'a with mentorship from Val Brown
	and PI Nalley in Summer 2024.
	• A candidate has been identified and interviewed
	as a potential Pacific Ciguatera Network
	coordinator (2 years, starting in Fall 2024).
	Issue (if any):
	Some delays identifying additional support slowed
	progress initially, but progress has momentum now
1	progress minimy, our progress has momentum now.

III. Project Challenges/Modifications

- The UH Office of Research Services has continued to be extremely short-staffed this year, leading to delays in accepting awards and issuing accounting codes.
- Issues with the eRA Commons system at NOAA have prevented us from moving forward with subawards, leading to several project delays.

IV. Publications

- Publications and Reports
 - A. T. Friedrich, B. S. Powell, J. L. Gunnarson, G. Liu, S. F. Giardina, M. F. Stuecker, L. Hosekova, K. Feloy, and C. A. Stock. Submesoscale-permitting physical/biogeochemical future projections for the main Hawaiian Islands. J. Adv. Model. Earth Syst., 16(e2023MS003855), 2024.
 - B. J. N. Perelman, K. R. Tanaka, J. Smith, H. Barkley, and B. S. Powell. Subsurface temperature estimates from a Regional Ocean Modelling System (ROMS) reanalysis provide accurate coral heat stress indices across the Main Hawaiian Islands. Scientific Reports, 14(6620), 2024.
- Notable Presentations
 - A. PacIOOS Director and Deputy Director were invited to the Joint Inter-Agency Coordinating Group (JIACG) of Indo-Pacific Command (IndoPACOM) to brief the regional security forces on maritime and climate intelligence supported in the region through PacIOOS ocean observing and forecast assets.
 - B. Undergraduate Student Diego Johansen presented at the Marine Technology Society 2024 Buoy Conference in Sequim, WA. "Hawai'i Island Water Quality Buoys: Tools for Resource Management and Education."
 - C. Melissa Iwamoto, Jordan Watson, Nicole Guiles presented "Backyard Buoys: Community led ocean observing across the Pacific" at the Pacific Islands Climate

Adaptation Science Center's Slice of PI-CASC seminar series; March 5, 2024. <u>Recording here.</u>

- D. Nicole Guiles presented "Backyard Buoys: Buoying Up Indigenous Access to Ocean Data" at UH Sea Grant's Nerd Nite; June 5, 2024.
- Student theses / dissertations
 - A. Elizabeth Hauschild utilized the PacIOOS operational wave forecast and buoy measurements for her Masters thesis "Performance Assessment of Wave Models for Cold Front Events in Hawai'i," which she defended in May 2024.
 - B. Peter Felicijan completed his B.S. in the Global Environmental Science program with a thesis on "The Effects of Environmental Forcing on the Water Quality in Ke'ehi Lagoon O'ahu, Hawai'i" using PacIOOS data.

V. Product Delivery:

• PacIOOS began providing visualizations of data served by PMEL for a new MAPCO2 buoy off of <u>Hawai'i Island.</u>

VI. Certification Updates

• No new updates

VII. Education, Media Engagement, and Outreach

For coverage of PacIOOS in the media, please refer to: <u>www.pacioos.hawaii.edu/media/</u> and find our newsletter archive at: <u>www.pacioos.hawaii.edu/newsletter/</u>.

Outreach activities include:

- February 14 Waikiki Aquarium, "Whale You Be my Valentine?" (Backyard Buoys and Shark Tagging)
- March 19 Waikiki Aquarium 120th Anniversary (Backyard Buoys and Shark Tagging)
- April 18 (Micro)plastic Surgery, a talk at Hula Grill in Waikiki by Dr. Eileen Nalley
- April 20 Bishop Museum Science and Sustainability Festival (Backyard Buoys and Shark Tagging)
- June 20 Outreach event at Pōkai Bay with Na Kama Kai (Water Quality Testing)
- June 24- Table at Fishers Forum (Demonstrating PacIOOS Voyager for fishers)

VIII. Budget Summary

- There were no delays in invoicing or payment.
- No equipment purchases were made during this progress period.

Cost Categories	Funding provided	Funds spent + encumbered	Funds remaining	Remaining %
Personnel	4,008,292.00	2,403,909.11	1,604,382.89	40%
Fringe Benefits	1,202,705.00	672,562.50	530,142.50	44%
Travel	347,200.00	234,401.51	112,798.49	32%
Equipment	153,413.00	101,057.00	52,356.00	34%
Supplies	377,961.00	335,710.37	42,250.63	11%
Contractual	854,613.00	562,611.39	292,001.61	34%
Other	649,264.00	596,329.50	52,934.50	8%
Total Direct Charges	7,593,448.00	4,906,581.38	2,686,866.62	35%
Indirect Charges	2,542,192.00	1,505,388.04	1,036,803.96	41%
Total Amounts	10,135,640.00	6,411,969.42	3,723,670.58	37%

Table of invoices for the entire award during the reporting period:

IX. Success Stories

Success Story	Brief Description	Contact
Micronesia satellite	PacIOOS teamed up with the NOAA Coastwatch program to	Jordan Watson
course	offer their satellite oceanography and data course to the	
	Micronesia region for the first time. The course was offered	
	virtually but with live instructor-led sessions centered on the	
	time zones of the Micronesia region. PacIOOS staff led	
	group and one-on-one instructional sessions focused on data	
	access and datasets specific to the needs of the Micronesia	
	region. Dozens of students attended the course, and	
	PacIOOS and the Coastwatch team have been invited to host	
	a condensed in-person version of the course at the Pacfic	
	Islands GIS and Remote Sensing Conference in November	
	2024. This work illustrates a highly effective method of	
	capacity building for resource managers and practitioners	
	across the region at a relatively nominal cost to NOAA.	
Broken pipe hazard	The National Energy Laboratory of Hawaii Authority	Brian Powell
safely removed using	(NELHA) contacted PacIOOS because they had an offshore	
ROMS forecast –	pipeline that had broken and posed a risk to life and	
protecting human safety	property. However, given the dangerous currents in the area,	
	removal of the pipeline required a forecast of the meso-scale	
	eddies in order to identify a slack period during which the	
	operation could proceed safely. The PacIOOS ROMS	
	modeling team provided a localized forecast for NELHA,	
	and they emailed several days later to inform us that the	
	forecast was accurate and facilitated the safe and successful	
	removal of the maritime hazard.	

American Samoa wave	PacIOOS partners in American Samoa (National Park of	Chip Young
buoy deployments	American Samoa, National Marine Sanctuary, Department	
	of Port Administration, and the skipper and crew of the	
	Manu'atele ferry) successfully redeployed the Aunu'u wave	
	buoy and deployed the new King-Poloa wave buoy without	
	members of the PacIOOS wave buoy team present. Due to	
	weather constraints, the PacIOOS wave buoy team missed	
	their deployment with the local partners so they conducted	
	an all-day training session and the local partners	
	successfully conducted the operations. This is a major move	
	towards more efficient buoy operations reducing data gaps	
	in the future. It also strengthens local commitment and	
	stewardship of the instrumentation.	