

## PROJECT REPORT

**VESSEL:** NOAA Ship *Oscar Elton Sette*, SE-24-06

**PROJECT PERIOD:** 1 July – 4 September 2024

**AREA OF OPERATION:** Main and Northwestern Hawaiian Islands

**MISSION TITLE:** National Coral Reef Monitoring Program (NCRMP) - Hawaiian Archipelago

### ITINERARY:

#### Leg I - Main Hawaiian Islands

July 1 **Departed Pearl Harbor.** 0700 all hands aboard. 1000 conducted fire and abandon ship drills. 1515 gangway up and underway for Maui.

July 2 **Maui.** 0800 dive briefing and dive emergency/chamber drill. 0845-1030 JHA review for small boat craning operations and small boat and gear weighing to account for malfunctioning deck crane load cell. 1300 small boats launched off Lahaina for coxswain training. 1700 all small boats back aboard. 2300 offshore shipboard CTD operations conducted overnight.

July 3 **Maui.** 0800 launched small boats Rubber Duck and Expedition for dive operations between Mā'alaea and Lahaina. 0900 conducted diver emergency drills. 1000 launched small boats Malia and SE-4. 1700 all small boats back aboard. 2300 offshore shipboard CTD operations conducted overnight.

*Work completed:* 8 Stationary Point Count (SPC) surveys, 8 sets of benthic photoquads collected, and 7 benthic photogrammetry belt surveys. Installation of new fixed monitoring site at Olowalu, including: 1 photogrammetry spiral survey, 4 Subsurface Temperature Recorders (STRs) deployed, 5 Calcification Accretion Units (CAUs) deployed, 3 Conductivity, Temperature, Depth (CTD) casts and carbonate chemistry water samples collected, and 1 carbonate budget assessment.

July 4 **Maui.** 0800-1700 Rubber Duck and Malia conducted small boat and dive operations between Mā'alaea and Honolua Bay. 2000 departed for Hawai'i Island.

*Work completed:* 4 SPC surveys, 4 sets of benthic photoquads collected, 4 benthic photogrammetry belt surveys, 2 STRs deployed, 1 STR retrieved, 5 CAUs deployed, 5 CAUs retrieved, 2 CTD casts and carbonate chemistry water samples collected, and diel suite oceanographic instrument package deployed.

July 5 **Hawai'i.** 0800-1700 Rubber Duck, Malia, SE-4, and Expedition conducted small boat and dive operations between Hōnaunau and Miloli'i.

*Work completed:* 9 SPC surveys, 9 sets of benthic photoquads collected, 9 benthic photogrammetry belt surveys, 1 photogrammetry spiral survey, 4 STRs deployed, 3

STRs retrieved, 5 CAUs deployed, 4 CAUs retrieved, 5 Bioerosion Monitoring Units (BMUs) deployed, 5 BMUs retrieved, 5 CTD casts and carbonate chemistry water samples collected, and 1 carbonate budget assessment.

July 6 **Hawai‘i.** 0800-1700 Rubber Duck, Malia, and SE-4 conducted small boat and dive operations off the Hāmākua and Kohala coasts.

*Work completed:* 6 SPC surveys, 6 sets of benthic photoquads collected, 6 benthic photogrammetry belt surveys, 1 photogrammetry box survey, 3 STRs deployed, 3 STRs retrieved, 5 CAUs deployed, 2 CAUs retrieved, 5 Bioerosion Monitoring Units (BMUs) deployed, 5 BMUs retrieved, 2 CTD casts and carbonate chemistry water samples collected, and 1 carbonate budget assessment.

July 7 **Hawai‘i.** 0800-1700 Rubber Duck, Malia, and SE-4 conducted small boat and dive operations along the Hāmākua coast. 2300 offshore shipboard CTD operations conducted overnight.

*Work completed:* 10 SPC surveys, 10 sets of benthic photoquads collected, 10 benthic photogrammetry belt surveys, and 6 CTD casts and carbonate chemistry water samples collected.

July 8 **Hawai‘i.** 0800-1700 Rubber Duck, Malia, and SE-4 conducted small boat and dive operations inside and south of Hilo Bay. 2300 offshore shipboard CTD operations conducted overnight.

*Work completed:* 8 SPC surveys, 8 sets of benthic photoquads collected, 8 benthic photogrammetry belt surveys, 1 photogrammetry spiral survey, 4 STRs deployed, 5 CAUs deployed, 5 Bioerosion Monitoring Units (BMUs) deployed, 6 CTD casts and carbonate chemistry water samples collected, and 1 carbonate budget assessment.

July 9 **Hawai‘i.** Small boat and dive operations off of Hilo were canceled due to weather. 2300 offshore shipboard CTD operations conducted overnight.

July 10 **Hawai‘i.** 0800-1700 Rubber Duck, Malia, SE-4, and Expedition conducted small boat and dive operations between Honokōhau and Kealakekua Bay. 2300 offshore shipboard CTD operations conducted overnight. Departed for Lana‘i.

*Work completed:* 17 SPC surveys, 17 sets of benthic photoquads collected, 17 benthic photogrammetry belt surveys, and 6 CTD casts and carbonate chemistry water samples collected.

July 11 **Lana‘i.** 0800-1700 Rubber Duck, Malia, SE-4, and Expedition conducted small boat and dive operations off the south coast of Lana‘i. 2300 offshore shipboard CTD operations conducted overnight.

*Work completed:* 11 SPC surveys, 11 sets of benthic photoquads collected, 11 benthic photogrammetry belt surveys, 1 photogrammetry spiral survey, 3 STRs

deployed, 5 CAUs deployed, 5 CAUs retrieved, 5 CTD casts and carbonate chemistry water samples collected, and 1 carbonate budget assessment.

July 12 **Kaho‘olawe.** 0800-1700 Rubber Duck, Malia, and Expedition conducted small boat and dive operations off the south coast of Kaho‘olawe. 2300 offshore shipboard CTD operations conducted overnight.

*Work completed:* 12 SPC surveys, 12 sets of benthic photoquads collected, and 7 benthic photogrammetry belt surveys.

July 13 **Kaho‘olawe.** 0800-1300 Rubber Duck, Malia, and Expedition conducted small boat and dive operations off the north coast of Kaho‘olawe. Operations were called off early due to high winds and seas.

*Work completed:* 7 SPC surveys, 7 sets of benthic photoquads collected, 6 benthic photogrammetry belt surveys, and 4 CTD casts and carbonate chemistry water samples collected.

July 14 **Lana‘i.** 0800-1700 Rubber Duck and Malia conducted small boat and dive operations off the west coast of Lana‘i.

*Work completed:* 7 SPC surveys, 7 sets of benthic photoquads collected, 3 benthic photogrammetry belt surveys, and 6 CTD casts and carbonate chemistry water samples collected.

July 15 **Kaho‘olawe.** 0800-1700 Rubber Duck, Malia, and SE-4 conducted small boat and dive operations off the north coast of Kaho‘olawe.

*Work completed:* 4 SPC surveys, 9 sets of benthic photoquads collected, 9 benthic photogrammetry belt surveys, 1 photogrammetry spiral survey, 1 photogrammetry box survey, 3 CTD casts and carbonate chemistry water samples collected, and 1 carbonate budget assessment.

July 16 **Maui.** 0800-1700 Rubber Duck and Malia conducted small boat and dive operations between Mā'alaea and Wailea. 2300 offshore shipboard CTD operations conducted overnight.

*Work completed:* 7 SPC surveys, 7 sets of benthic photoquads collected, 6 benthic photogrammetry belt surveys, and 3 CTD casts and carbonate chemistry water samples collected.

July 17 **Moloka‘i.** Small boat and dive operations off southern Moloka‘i were canceled due to diver exposure to paint fumes the previous evening. 1100-1700 shipboard CTD operations conducted offshore of north Moloka‘i.

July 18 **Moloka‘i.** 0800-1700 Rubber Duck, Malia, and Expedition conducted small boat and dive operations off the west coast of Moloka‘i.

*Work completed:* 11 SPC surveys, 11 sets of benthic photoquads collected, 6 benthic photogrammetry belt surveys, 3 STRs deployed, 3 STRs retrieved, 5 CAUs deployed, 5 CAUs retrieved, and 5 CTD casts and carbonate chemistry water samples collected.

July 19 **Moloka‘i.** 0800-1700 Rubber Duck, Malia, SE-4, and Expedition conducted small boat and dive operations off the northeastern coast of Moloka‘i. 2300 offshore shipboard CTD operations conducted overnight.

*Work completed:* 10 SPC surveys, 10 sets of benthic photoquads collected, 10 benthic photogrammetry belt surveys, 1 photogrammetry spiral survey, 4 STRs deployed, 3 STRs retrieved, 5 CAUs deployed, 3 CAUs retrieved, 6 CTD casts and carbonate chemistry water samples collected, and 1 carbonate budget assessment.

July 20 **Maui.** 0800-1700 Rubber Duck, Malia, SE-4, and Expedition conducted small boat and dive operations off the northeastern coast of Maui. 2300 offshore shipboard CTD operations conducted overnight.

*Work completed:* 8 SPC surveys, 9 sets of benthic photoquads collected, 9 benthic photogrammetry belt surveys, 1 photogrammetry spiral survey, 4 STRs deployed, 3 STRs retrieved, 5 CAUs deployed, 5 CAUs retrieved, 5 CTD casts and carbonate chemistry water samples collected, and 1 carbonate budget assessment.

July 21 **Moloka‘i.** 0800-1700 Rubber Duck and Malia conducted small boat and dive operations off the southern coast of Moloka‘i. 2300 offshore shipboard CTD operations conducted overnight.

*Work completed:* 6 SPC surveys, 7 sets of benthic photoquads collected, 7 benthic photogrammetry belt surveys, 1 photogrammetry spiral survey, 2 STRs deployed, 10 CAUs deployed, 10 CAUs retrieved, 5 CTD casts and carbonate chemistry water samples collected, and 1 carbonate budget assessment.

July 22 **Maui.** 0800-1100 Rubber Duck recovered diel suite oceanographic instrument package at Olowalu. 2300 offshore shipboard CTD operations conducted overnight. Departed for O‘ahu.

July 23 **O‘ahu.** 0845-100 conducted helicopter evacuation drills with the United States Coast Guard. 1300 launched Rubber Duck for small boat fuel and supplies pick up at Ford Island. 1330 launched Malia for dive operations off South Shore. 1700 all small boats back aboard. Departed for Kaua‘i.

*Work completed:* 1 SPC survey.

July 24 **Kaua‘i.** 0800-1700 Rubber Duck, Malia, and SE-4 conducted small boat and dive operations between Port Allen and Polihale.

*Work completed:* 8 SPC surveys, 8 sets of benthic photoquads collected, 8 benthic photogrammetry belt surveys, 4 STRs deployed, 4 STRs retrieved, 5 CAUs

deployed, 4 CAUs retrieved, and 6 CTD casts and carbonate chemistry water samples collected.

July 25 **Kaua‘i.** 0800-1700 Rubber Duck, Malia, and SE-4 conducted small boat and dive operations off the Nā Pali coast. 2300 offshore shipboard CTD operations conducted overnight.

*Work completed:* 7 SPC surveys, 7 sets of benthic photoquads collected, 6 benthic photogrammetry belt surveys, 1 photogrammetry spiral survey, 4 STRs deployed, 3 STRs retrieved, 5 CAUs deployed, 5 CAUs retrieved, 5 CTD casts and carbonate chemistry water samples collected, and 1 carbonate budget assessment.

July 26 **Ni‘ihau.** 0800-1700 Rubber Duck, Malia, SE-4, and Expedition conducted small boat and dive operations off the eastern coast of Ni‘ihau.

*Work completed:* 14 SPC surveys, 14 sets of benthic photoquads collected, 7 benthic photogrammetry belt surveys, 3 STRs deployed, 1 STRs retrieved, 5 CAUs deployed, 4 CAUs retrieved, and 5 CTD casts and carbonate chemistry water samples collected.

July 27 **Ni‘ihau.** 0800-1500 Rubber Duck, Malia, and SE-4 conducted small boat and dive operations off the northeastern coast of Ni‘ihau and Lehua Island. Operations were called off early due to high winds and seas. 2300 offshore shipboard CTD operations conducted overnight.

*Work completed:* 7 SPC surveys, 8 sets of benthic photoquads collected, 8 benthic photogrammetry belt surveys, 1 STR deployed, 5 CAUs deployed, 5 CAUs retrieved, 1 CTD cast and carbonate chemistry water sample collected, and 1 carbonate budget assessment.

July 28 **Ni‘ihau.** 0800-1500 Rubber Duck and Malia conducted small boat and dive operations off the southeastern coast of Ni‘ihau. 2300 offshore shipboard CTD operations conducted overnight.

*Work completed:* 9 SPC surveys, 9 sets of benthic photoquads collected, 6 benthic photogrammetry belt surveys, and 2 CTD casts and carbonate chemistry water samples collected.

July 29 **Kaua‘i.** Small boat and dive operations off Līhu‘e were canceled due to weather. 1000-1700 shipboard CTD operations conducted. 1800 departed for O‘ahu.

July 30 **Arrived at Pearl Harbor.** 0800 gangway down. 0900 scientific party disembarked and gear/samples offloaded. End of Leg I.

## Leg II - Papahānaumokuākea (Northwestern Hawaiian Islands)

August 4 **Delayed Pearl Harbor.** Delayed for three no sail conditions that needed to be addressed: thru hull inspection certificate, comms waiver, and broken crane.

August 5 **Delayed Pearl Harbor.** Delayed again to address no sail conditions and lack of time slot from Pearl Harbor control. Crane fixed and tested by 14:00. PH control gave permission to depart 0800 on the 6th. PLBs and sat phones tested.

August 6 **Departed Pearl Harbor.** 0800 Underway for Lalo.

August 7 **Underway Bound for Lalo.** Bleached all personal dive gear. Safety, team, and cultural meetings throughout the day. Very busy transit day!

August 8 **Lalo.** Arrived at SE Lalo 0700, conditions check at 0800. 0845 started launching Nalu/Malia/Expedition/SE4. Worked the NW corner from Shark Island to east of Tern. Weather was wonderful. All 4 boats diver extraction drills.

*Work Completed:* 11 SPC Surveys, 9 benthic photogrammetry belt surveys, 12 sets of benthic photoquads and 1 water sample collected at random sites. Worked 3 fixed sites, with 3 sets of benthic photoquads, deployed/recovered 3/2 STRs, and completed Carbonate Budgets at 1 site. Deployed and recovered 5 Isaacs-Kidd midwater trawls.

August 9 **Lalo.** 0800-1700 All 4 boats conducted dive operations along the East side of Lalo.

*Work Completed:* 12 SPC Surveys, 4 benthic photogrammetry belt surveys, 12 sets of benthic photoquads and 3 water samples collected at random sites. Worked 3 fixed sites, with 3 sets of benthic photoquads, 3 water samples, deployed/recovered 3/2 STRs, deployed and recovered CAUs and BMUs, and completed Carbonate Budgets at 1 site. Performed offshore water sample. Deployed and recovered 5 Isaacs-Kidd midwater trawls.

August 10 **Lalo.** 0800-1700 All 4 boats conducted dive operations along the SE side of Lalo.

*Work Completed:* 12 SPC Surveys, 5 benthic photogrammetry belt surveys, 12 sets of benthic photoquads and 1 water sample collected at random sites. Worked 3 fixed sites, with 3 sets of benthic photoquads, 2 water samples, deployed/recovered 3/1 STRs, deployed CAUs and BMUs, and completed Carbonate Budgets at 1 site. Performed offshore water sample. Deployed and recovered 5 Isaacs-Kidd midwater trawls.

August 11 **Lalo.** 0800-1700 All 4 boats conducted dive operations along the northwest side and inside the lagoon of Lalo. Noted large coral spawn slick along northern coast, likely *Porites* due to separated sperm/egg slicks, symbiotic eggs, and seasonal timing. Bleached all gear at 3% bleach at end of operations at Lalo.

*Work Completed:* 10 SPC Surveys, 12 benthic photogrammetry belt surveys, 12 sets of benthic photoquads and 3 water samples collected at random sites. Worked 4 fixed sites, with 2 sets of benthic photoquads, 4 water samples, deployed/recovered 0/1 STRs, deployed and recovered CAUs and BMUs at one site, with a CAU recovery at another, and completed Carbonate Budgets at 1 site.

Performed 2 offshore water samples. Deployed and recovered 5 Isaacs-Kidd midwater trawls.

August 12 **Transit to Kapou.** Deployed and recovered 1 Isaacs-Kidd midwater trawl.

August 13 **Transit to Kapou.** Arrive 2000. Deployed and recovered 5 Isaacs-Kidd midwater trawls.

August 14 **Kapou.** 0800-1700 All 4 boats conducted dive operations along the west side of Neva shoals.

*Work Completed:* 12 SPC Surveys, 12 benthic photogrammetry belt surveys, 12 sets of benthic photoquads and 3 water samples collected at random sites. Worked 3 fixed sites, with 3 sets of benthic photoquads, 3 water samples, deployed/recovered 3/3 STRs, deployed and recovered CAUs, and completed Carbonate Budgets at 1 site. Performed offshore water sample. Deployed and recovered 4 Isaacs-Kidd midwater trawls.

August 15 **Kapou.** 0800-1700 All 4 boats conducted dive operations along the east and south sides of Neva shoals.

*Work Completed:* 11 SPC Surveys, 10 benthic photogrammetry belt surveys, 11 sets of benthic photoquads and 1 water sample collected at random sites. Worked 4 fixed sites, with 4 sets of benthic photoquads, 4 water samples, deployed/recovered 4/2 STRs, deployed and recovered CAUs, and completed Carbonate Budgets at 1 site. Performed 2 offshore water samples. Deployed and recovered 5 Isaacs-Kidd midwater trawls.

August 16 **Kapou.** 0800-1700 All 4 boats conducted dive operations along the north side of Kapou.

*Work Completed:* 11 SPC Surveys, 9 benthic photogrammetry belt surveys, 11 sets of benthic photoquads and 3 water samples collected at random sites. Worked 3 fixed sites, with 4 sets of benthic photoquads, 4 water samples, deployed/recovered 3/3 STRs, deployed and recovered CAUs, and completed Carbonate Budgets at 1 site. Deployed and recovered 4 Isaacs-Kidd midwater trawls.

August 17 **Kapou.** 0800-1700 Nalu, Malia, Expedition conducted dive operations around Kapou. SE4 worked on ship's coxswain training. Departed Kapou at 1800.

*Work Completed:* 10 SPC Surveys, 6 benthic photogrammetry belt surveys, 10 sets of benthic photoquads and 5 water samples collected at random sites. Worked 1 fixed site, with 1 set of benthic photoquads, 1 water sample, recovered CAUs, and completed Carbonate Budgets at 1 site. Performed 1 offshore water sample.

August 18 **Transit.** Canceled plans to deploy/recover HARP. Devoted time to troubleshoot the ship's oily water separator outside of the monument border. Performed the 100

hr service on Malia/Expedition. Deployed and recovered 6 Isaacs-Kidd midwater trawls.

August 19 **Hōlanikū**. *For the remainder of the cruise, we refrained from launching SE4 to avoid invasive species quarantine.* 0800-1700 Nalu, Malia, Expedition conducted dive operations along the northern shore of Hōlanikū.

*Work Completed:* 10 SPC Surveys, 9 benthic photogrammetry belt surveys, 10 sets of benthic photoquads and 4 water samples collected at random sites. Worked 2 fixed sites, with 2 sets of benthic photoquads, 3 water samples, deployed/recovered 2/2 STRs, deployed and recovered CAUs, and completed Carbonate Budgets at 1 site. Performed 1 offshore water sample.

August 20 **Hōlanikū**. 0800-1700 Nalu, Malia, Expedition conducted dive operations along the southern shore of Hōlanikū.

*Work Completed:* 10 SPC Surveys, 12 benthic photogrammetry belt surveys, 12 sets of benthic photoquads and 5 water samples collected at random sites. Worked 1 fixed site, with 1 sets of benthic photoquads, deployed/recovered 1/1 STRs. Deployed and recovered 4 Isaacs-Kidd midwater trawls.

August 21 **Hōlanikū**. 0800-1700 Nalu, Malia, and Expedition conducted dive operations along the western shore of Hōlanikū.

*Work Completed:* 8 SPC Surveys, 9 benthic photogrammetry belt surveys, 10 sets of benthic photoquads and 3 water samples collected at random sites. Worked 2 fixed sites, with 2 sets of benthic photoquads, 2 water samples, deployed/recovered 2/2 STRs, deployed and recovered CAUs, and completed Carbonate Budgets at 1 site. Performed 1 offshore water sample. Deployed and recovered 1 Isaacs-Kidd midwater trawl.

August 22 **Hōlanikū**. 0800-1700 Nalu and Malia conducted dive operations inside the lagoon of Hōlanikū. All personal gear and scientific equipment bleached at 6% for ten minutes. All boats bleached at 10% for ten minutes.

*Work Completed:* 7 SPC Surveys, 8 benthic photogrammetry belt surveys, 8 sets of benthic photoquads and 4 water samples collected at random sites. Worked 2 fixed sites, with 1 set of benthic photoquads, 2 water samples, deployed/recovered 2/1 STRs.

August 23 **Manawai**. 1030-1700 Nalu, Malia, and Expedition conducted dive operations around Manawai. Late start due to rough conditions and overheating generators.

*Work Completed:* 7 SPC Surveys, 7 benthic photogrammetry belt surveys, and 7 sets of benthic photoquads collected at random sites. Worked 3 fixed sites, with 3 sets of benthic photoquads, 3 water samples, deployed/recovered 3/3 STRs, and deployed and recovered CAUs and BMUs. Deployed and recovered 7 Isaacs-Kidd midwater trawl.

August 24 **Manawai.** 0800-1700 Nalu, Malia, and Expedition conducted dive operations along the south shore of Manawai.

*Work Completed:* 10 SPC Surveys, 11 benthic photogrammetry belt surveys, and 11 sets of benthic photoquads collected at random sites. Worked 3 fixed sites, with 3 sets of benthic photoquads, 3 water samples, deployed/recovered 4/3 STRs, deployed and recovered CAUs and BMUs, and completed Carbonate Budgets at 1 site. Performed 1 offshore water sample. Deployed and recovered 4 Isaacs-Kidd midwater trawl.

August 25 **Manawai.** 0800-1700 Nalu, Malia, and Expedition conducted dive operations along the northeast shore of Manawai.

*Work Completed:* 9 SPC Surveys, 10 benthic photogrammetry belt surveys, and 11 sets of benthic photoquads collected at random sites. Worked 3 fixed sites, with 3 sets of benthic photoquads, 3 water samples, deployed/recovered 3/2 STRs, deployed CAUs and BMUs, and completed Carbonate Budgets at 1 site. Performed 1 offshore water sample. Deployed and recovered 5 Isaacs-Kidd midwater trawl.

August 26 **Manawai.** 0600-1200 Deployed and recovered High-Frequency Acoustic Recording Package (HARP) and performed offshore historic site CTD. No small boat or diving ops due to thunder/lightning. Deployed and recovered 5 Isaacs-Kidd midwater trawl.

August 27 **Manawai.** 0800–1700 Nalu, Malia, and Expedition conducted dive operations transiting from northeast of Manawai, through the lagoon, and completing operations along the western shore of Manawai. All gear and boats bleached. Secured for seas. Left Manawai 19:00.

*Work Completed:* 10 SPC surveys, 12 benthic photogrammetry belt surveys, 12 sets of benthic photoquads and 2 water samples collected at random sites. Worked 1 fixed site, with 1 set of benthic photoquads, 1 water sample, deployed/recovered 1/1 STRs, recovered CAUs at 1 site.

August 28-31 **Transit to Pearl Harbor.**

September 1. **Arrive Pearl Harbor.** Arrive 1500, gangway down 1600. End of Leg II.

## **MISSION OBJECTIVES AND RESULTS:**

NOAA's National Coral Reef Monitoring Program (NCRMP) provides scientific information that supports ecosystem approaches to the management and conservation of coral reefs. Long-term, multidisciplinary NCRMP monitoring efforts include oceanographic data collection and ecological surveys of coral reef fish, corals, algae, and other marine invertebrates.

### ***Objectives:***

The primary NCRMP objectives for SE-24-06 were:

1. Monitor species composition, abundance, size, and spatial distribution of reef fishes, corals, other invertebrates, and algae using stationary point count (SPC) fish surveys, Structure-from-Motion (SfM) belt surveys, and photoquadrat benthic surveys at stratified random survey sites.
2. Recover and redeploy oceanographic and ecological instrumentation at fixed monitoring sites to assess reef environmental conditions and biological responses, including Subsurface Temperature Recorders (STRs), Calcification Accretion Units (CAUs) and Bioerosion Monitoring Units (BMUs).
3. Conduct carbonate budget assessments (including SfM imagery collection, urchin surveys, and SPC fish surveys) at select fixed monitoring sites.
4. Collect nearshore conductivity, temperature, and depth (CTD) casts and carbonate chemistry water samples at fixed and random survey sites.
5. Deploy the diel suite oceanographic instrument package at Olowalu, Maui.
6. Conduct shipboard CTD casts and carbonate chemistry water samples ~15 km offshore at each island/island group.

Piggyback objectives for this project included:

1. Conduct 5–8 sequential CTD casts and collect fluorometry water samples to support uncrewed marine systems (Leg I).
2. Conduct 4 sequential “Long-Term” CTD casts and collect fluorometry water samples to support Uncrewed Marine Systems (Leg II).
3. Conduct 50+ Isaacs-Kidd Midwater Trawls in offshore to onshore transects to monitor ichthyoplankton (Leg II).
4. Deploy and Recover a HARP package at Manawai (Leg II).

### **Results:**

Random site team accomplishments for this project include (see [Table 1](#) and [Figure 1](#) for locations of random site surveys):

- 411 SPC fish surveys
- 368 SfM belt surveys
- 436 photoquadrat benthic surveys
- 96 CTD casts and carbonate chemistry samples collected at random sites

Fixed site team accomplishments for this project include (see [Table 2](#) and [Figure 1](#) for locations of fixed site deployments and surveys):

- 112 STRs deployed / 80 retrieved
- 150 CAUs deployed / 111 retrieved
- 65 BMUs deployed / 40 retrieved
- 83 CTD casts and carbonate chemistry samples collected at fixed sites
- 20 CTD casts and carbonate chemistry samples collected at offshore sites
- 28 fixed site SfM surveys
- 26 carbonate budget assessments
- 1 diel suite deployment at Olowalu, Maui

Accomplishments for piggyback projects include:

- 45 shipboard offshore CTD casts and fluorometry samples collected in support of uncrewed marine systems in the main Hawaiian Islands (Leg I)
- 4 shipboard CTD casts and fluorometry water samples were collected at historical sampling locations (Leg II)
- 71 IKMTs, bracketing all 4 islands (Leg II)
- Recovered and deployed HARP package at Manawai (Leg II)

## SCIENTIFIC PERSONNEL:

### Participating Institutions

- NOAA Pacific Islands Fisheries Science Center (PIFSC)
  - Ecosystem Sciences Division (ESD)
  - Pelagic Research Division (PRP)
- Cooperative Institute for Marine and Atmospheric Research (CIMAR)
- NOAA Diving Program (NDP)
- University of Hawai‘i (UH)

NOAA operators-in-charge (OIC) were requalified through their personnel qualification standards (PQS) practical examination and were capable of leading a team of divers on small boat and dive operations. Small boat operators (SBO) were staff that had completed the required NOAA small boat training but had an active OIC top-side during all small boat operations.

### Leg I - Main Hawaiian Islands

Name	Role	Organization
Hannah Barkley	Chief Scientist/Fixed Site Diver	PIFSC ESD
Joao Garriques	Operations Lead/OIC/Fixed Site Diver	CIMAR
Tye Kindinger	Fish Team Lead/Random Site Diver	PIFSC ESD
Jonathan Charendoff	Benthic Team Lead/SBO/Random Site Diver	CIMAR
Ariel Halperin	OCC Team Lead/OIC/Fixed Site Diver	CIMAR
Lori Luers	Data Manager/Random Site Diver	CIMAR
Candace Alagata	SBO/Fixed Site Diver	CIMAR
Corinne Amir	Random Site Diver	CIMAR
Matthew Chauvin	OIC/Random Site Diver	CIMAR
Daniela Escontrela	Random Site Diver	UH

Laura Gajdzik	Random Site Diver	CIMAR
Mia Lamirand	SBO/Random Site Diver	CIMAR
Roseanna Lee	SBO/Random Site Diver	CIMAR
Andrew Shantz	Random Site Diver	CIMAR
Rebecca Weible	OIC/Fixed Site Diver	CIMAR
Tate Wester	OIC	CIMAR
Sean Digre	Chamber Operator	NDP
Thomas Horn	Chamber Operator in Training	NDP

#### **Leg II - Northwestern Hawaiian Islands**

Name	Role	Organization
Thomas Oliver	Chief Scientist/Fixed Site Diver	PIFSC ESD
Matthew Chauvin	Operations Lead/OIC/Random Site Diver	CIMAR
Andrew Shantz	Fish Team Lead/Random Site Diver	CIMAR
Corinne Amir	Benthic Team Lead/Random Site Diver	CIMAR
Rebecca Weible	OCC Team Lead/OIC/Fixed Site Diver	CIMAR
Juliette Verstaen	Data Manager/Random Site Diver	CIMAR
Ariel Halperin	OIC/Fixed Site Diver	CIMAR
Tate Wester	OIC	CIMAR
Candace Alagata	SBO/Fixed Site Diver	CIMAR

Jonathan Charendoff	SBO/Random Site Diver	CIMAR
Mia Lamirand	SBO/Random Site Diver	CIMAR
Roseanna Lee	SBO/Random Site Diver	CIMAR
Isabelle Basden	Random Site Diver	CIMAR
Raymond Boland	Random Site Diver	CIMAR
Joy Smith	Fixed Site Diver	CIMAR
Justin Suca	Ichthyoplankton Trawls	CIMAR
Dash Dicksion	Ichthyoplankton Trawls	PIFSC ESD
Ashley Nalani Olguin	Hawaiian Cultural Practitioner	UH
Mikey Kent	Chamber Operator	NDP

Submitted by: \_\_\_\_\_

Dr. Hannah Barkley

Chief Scientist

Approved by: \_\_\_\_\_

Dr. Charles Littnan

Science Director

Pacific Islands Fisheries Science Center

## TABLES

**Table 1.** Summary of random site activities on SE-24-06 in the main Hawaiian Islands (MHI; Leg I) and Northwestern Hawaiian Islands (NWHI; Leg II). Abbreviations refer to: SPC = Stationary Point Count Survey (Fish Visual Census); SfM = Structure from Motion (Benthic Photogrammetry Survey); CTD = Conductivity, Temperature, Depth profiles; H<sub>2</sub>O = carbonate chemistry water samples.

Region	Site ID	Latitude	Longitude	Fish SPC	Benthic SfM	Photo-quad	CTD/ H <sub>2</sub> O
MHI	HAW-4618	20.0232	-155.2913	X	X	X	X
MHI	HAW-4619	20.1014	-155.4612	X	X	X	
MHI	HAW-4621	20.0916	-155.4334	X	X	X	X
MHI	HAW-4622	20.0506	-155.3464	X	X	X	X
MHI	HAW-4623	20.0776	-155.4026	X	X	X	X
MHI	HAW-4624	20.219	-155.7277	X	X	X	
MHI	HAW-4627	20.2324	-155.7462	X	X	X	
MHI	HAW-4630	20.2515	-155.7759	X	X	X	
MHI	HAW-4638	19.6101	-155.9872		X	X	
MHI	HAW-4647	19.6783	-156.0369	X	X	X	
MHI	HAW-4650	19.6072	-155.9863		X	X	
MHI	HAW-4657	19.3177	-155.8911	X	X	X	
MHI	HAW-4667	19.6534	-154.9679	X	X	X	X
MHI	HAW-4677	19.6822	-154.9778	X	X	X	X
MHI	HAW-4678	19.7498	-155.055	X	X	X	
MHI	HAW-4697	20.2148	-155.7307	X	X	X	
MHI	HAW-4698	20.267	-155.8619	X	X	X	
MHI	HAW-4700	20.1428	-155.6182	X	X	X	X
MHI	HAW-4704	20.1194	-155.5279	X	X	X	
MHI	HAW-4709	20.1053	-155.4785	X	X	X	X

Region	Site ID	Latitude	Longitude	Fish SPC	Benthic SfM	Photo-quad	CTD/ H <sub>2</sub> O
MHI	HAW-4715	19.5533	-155.9678	X	X	X	
MHI	HAW-4727	19.5103	-155.9568	X	X	X	X
MHI	HAW-4729	19.4015	-155.9102	X	X	X	
MHI	HAW-4730	19.1379	-155.9156	X	X	X	
MHI	HAW-4731	19.2928	-155.8907	X	X	X	
MHI	HAW-4732	19.1977	-155.9067	X	X	X	
MHI	HAW-4733	19.17	-155.9115	X	X	X	X
MHI	HAW-4736	19.6328	-155.9948	X	X	X	X
MHI	HAW-4742	19.3303	-155.8862	X	X	X	
MHI	HAW-4747	19.7241	-154.9923	X	X	X	
MHI	HAW-4760	19.6712	-154.9816	X	X	X	X
MHI	HAW-4770	19.744	-155.0734	X	X	X	
MHI	HAW-4783	20.1805	-155.6848	X	X	X	
MHI	HAW-4785	20.1352	-155.6046	X	X	X	
MHI	HAW-4791	19.1306	-155.9166	X	X	X	X
MHI	HAW-4796	19.6555	-156.0323	X	X	X	X
MHI	HAW-4808	19.4825	-155.942	X		X	X
MHI	HAW-4812	19.1818	-155.9101	X	X	X	
MHI	HAW-4814	19.736	-155.0072	X	X	X	
MHI	HAW-4817	19.7372	-155.0557	X	X	X	
MHI	HAW-4862	19.4649	-155.925	X	X	X	
MHI	HAW-4876	19.4428	-155.9223	X	X	X	
MHI	HAW-4936	19.5979	-155.977	X		X	

Region	Site ID	Latitude	Longitude	Fish SPC	Benthic SfM	Photo-quad	CTD/ H <sub>2</sub> O
MHI	HAW-4937	19.5842	-155.9722	X		X	
MHI	HAW-4938	19.5738	-155.9691	X	X	X	X
MHI	HAW-4939	19.5655	-155.973	X	X	X	X
MHI	HAW-4940	19.5612	-155.9635	X	X	X	
MHI	HAW-4942	19.533	-155.9572	X		X	
MHI	HAW-4945	19.4936	-155.9497	X	X	X	
MHI	KAH-0688	20.6072	-156.577	X	X	X	
MHI	KAH-0690	20.5594	-156.6711	X	X	X	X
MHI	KAH-0698	20.5822	-156.6259	X		X	
MHI	KAH-0716	20.5072	-156.687	X		X	
MHI	KAH-0721	20.5317	-156.7079	X	X	X	
MHI	KAH-0728	20.5613	-156.6609		X		X
MHI	KAH-0730	20.6053	-156.5679		X	X	
MHI	KAH-0732	20.6058	-156.579		X	X	
MHI	KAH-0736	20.5718	-156.6366	X	X	X	X
MHI	KAH-0738	20.6035	-156.5818		X	X	
MHI	KAH-0739	20.6057	-156.5722		X	X	
MHI	KAH-0741	20.5854	-156.6143	X	X	X	X
MHI	KAH-0744	20.5658	-156.6479	X	X	X	
MHI	KAH-0745	20.588	-156.6129	X	X	X	X
MHI	KAH-0758	20.5238	-156.7114	X		X	
MHI	KAH-0760	20.5238	-156.599	X		X	
MHI	KAH-0766	20.5163	-156.6969	X		X	

Region	Site ID	Latitude	Longitude	Fish SPC	Benthic SfM	Photo-quad	CTD/ H <sub>2</sub> O
MHI	KAH-0769	20.5863	-156.5456	X	X	X	
MHI	KAH-0772	20.5818	-156.6211	X	X	X	
MHI	KAH-0773	20.5933	-156.5501	X	X	X	
MHI	KAH-0777	20.5801	-156.6245	X	X	X	X
MHI	KAH-0779	20.523	-156.6999	X	X	X	
MHI	KAH-0780	20.5032	-156.6766	X	X	X	
MHI	KAH-0781	20.5293	-156.7017	X	X	X	
MHI	KAH-0785	20.5066	-156.6546	X		X	
MHI	KAH-0787	20.5061	-156.6445	X	X	X	
MHI	KAH-0789	20.5121	-156.624	X	X	X	
MHI	KAH-0791	20.5102	-156.5915	X	X	X	
MHI	KAU-2404	22.1397	-159.751	X		X	
MHI	KAU-2412	22.1071	-159.7793	X	X	X	
MHI	KAU-2421	22.1736	-159.7199	X	X	X	
MHI	KAU-2428	21.8904	-159.6139	X	X	X	X
MHI	KAU-2435	21.9186	-159.6612	X	X	X	
MHI	KAU-2444	21.9207	-159.6517	X	X	X	
MHI	KAU-2449	22.1203	-159.7397	X	X	X	
MHI	KAU-2451	22.1597	-159.7087	X	X	X	X
MHI	KAU-2458	21.9217	-159.6425	X	X	X	
MHI	KAU-2460	21.9299	-159.6478	X	X	X	
MHI	KAU-2467	22.1806	-159.6479	X	X	X	
MHI	KAU-2468	22.16	-159.7024	X	X	X	X

Region	Site ID	Latitude	Longitude	Fish SPC	Benthic SfM	Photo-quad	CTD/ H <sub>2</sub> O
MHI	KAU-2522	21.8949	-159.5849	X	X	X	X
MHI	KAU-2523	21.904	-159.6205	X	X	X	X
MHI	KAU-2524	21.9115	-159.6336	X	X	X	
MHI	LAN-2206	20.7506	-156.9824	X	X	X	X
MHI	LAN-2209	20.7319	-156.9664	X	X	X	
MHI	LAN-2210	20.7331	-156.9496	X	X	X	
MHI	LAN-2217	20.8101	-156.9886	X		X	X
MHI	LAN-2239	20.8203	-156.9894	X		X	X
MHI	LAN-2240	20.7547	-156.9843	X	X	X	
MHI	LAN-2241	20.8045	-156.9899	X	X	X	
MHI	LAN-2243	20.7343	-156.9373	X	X	X	X
MHI	LAN-2245	20.732	-156.9565	X	X	X	X
MHI	LAN-2246	20.7794	-156.9904	X	X	X	
MHI	LAN-2251	20.7707	-156.9889	X	X	X	
MHI	LAN-2270	20.7595	-156.9848	X	X	X	
MHI	LAN-2275	20.784	-156.9909	X	X	X	X
MHI	LAN-2308	20.8646	-157.0436	X	X	X	X
MHI	LAN-2311	20.8467	-157.0064	X		X	X
MHI	LAN-2314	20.8525	-157.0139	X		X	X
MHI	LAN-2316	20.8366	-156.9985	X	X	X	X
MHI	LAN-2320	20.8627	-157.0356	X	X	X	
MHI	MAI-4295	20.7169	-156.4593	X	X	X	X
MHI	MAI-4301	20.7775	-156.4929	X	X	X	X

Region	Site ID	Latitude	Longitude	Fish SPC	Benthic SfM	Photo-quad	CTD/ H <sub>2</sub> O
MHI	MAI-4310	20.9483	-156.6955	X	X	X	
MHI	MAI-4313	20.9136	-156.7019	X		X	
MHI	MAI-4318	20.8501	-156.1243	X	X	X	
MHI	MAI-4323	20.9134	-156.2132	X	X	X	
MHI	MAI-4326	20.8196	-156.0632	X	X	X	X
MHI	MAI-4383	20.8008	-156.5971	X	X	X	
MHI	MAI-4387	20.8025	-156.6181	X	X	X	
MHI	MAI-4395	20.8322	-156.6444	X	X	X	
MHI	MAI-4398	21.0022	-156.6689	X	X	X	
MHI	MAI-4399	20.874	-156.6868	X	X	X	
MHI	MAI-4413	20.8104	-156.0547	X	X	X	X
MHI	MAI-4416	20.8658	-156.1511	X	X	X	
MHI	MAI-4424	20.9151	-156.224		X	X	
MHI	MAI-4455	20.7899	-156.5079	X	X	X	
MHI	MAI-4464	20.8195	-156.6313	X	X	X	
MHI	MAI-4465	20.8854	-156.6884	X	X	X	
MHI	MAI-4466	20.8334	-156.6472	X	X	X	
MHI	MAI-4470	20.8411	-156.1277	X	X	X	
MHI	MAI-4488	20.7065	-156.4562	X		X	X
MHI	MAI-4491	20.7191	-156.458	X	X	X	
MHI	MAI-4498	20.7097	-156.4473		X	X	
MHI	MAI-4502	20.6817	-156.4467	X	X	X	
MHI	MAI-4504	20.8893	-156.1913	X	X	X	

Region	Site ID	Latitude	Longitude	Fish SPC	Benthic SfM	Photo-quad	CTD/ H <sub>2</sub> O
MHI	MAI-4506	20.8794	-156.1752	X	X	X	
MHI	MAI-4533	20.7867	-156.5634	X	X	X	X
MHI	MAI-4534	20.7748	-156.5388	X	X	X	
MHI	MOL-2608	21.1767	-156.7955	X	X	X	
MHI	MOL-2610	21.1743	-156.8534	X	X	X	
MHI	MOL-2635	21.2155	-157.2624	X		X	X
MHI	MOL-2637	21.1838	-157.2648	X	X	X	
MHI	MOL-2645	21.1228	-157.3225	X		X	
MHI	MOL-2661	21.1671	-156.8711	X	X	X	
MHI	MOL-2662	21.1635	-156.9013	X	X	X	X
MHI	MOL-2663	21.1651	-156.8615	X	X	X	
MHI	MOL-2667	21.1755	-156.811	X	X	X	
MHI	MOL-2669	21.17	-156.8423	X	X	X	X
MHI	MOL-2692	21.1773	-157.2616	X	X	X	X
MHI	MOL-2694	21.1057	-157.3098	X		X	
MHI	MOL-2695	21.1653	-157.2747	X		X	
MHI	MOL-2704	21.1259	-157.3041	X	X	X	
MHI	MOL-2706	21.2103	-157.2557	X	X	X	X
MHI	MOL-2710	21.0795	-157.2285		X	X	
MHI	MOL-2714	21.1977	-157.2516	X		X	
MHI	MOL-2725	21.1656	-156.8375	X	X	X	
MHI	MOL-2742	21.0873	-157.0795	X	X	X	X
MHI	MOL-2747	21.1134	-157.3045	X	X	X	

Region	Site ID	Latitude	Longitude	Fish SPC	Benthic SfM	Photo-quad	CTD/ H <sub>2</sub> O
MHI	MOL-2752	21.2033	-157.2499	X	X	X	
MHI	MOL-2802	21.0639	-156.9903	X	X	X	X
MHI	MOL-2804	21.0756	-157.036	X	X	X	X
MHI	MOL-2807	21.1676	-156.7336	X	X	X	
MHI	MOL-2809	21.1778	-156.7687	X	X	X	X
MHI	MOL-2814	21.0829	-157.1241	X	X	X	
MHI	MOL-2815	21.0884	-157.1185	X	X	X	
MHI	MOL-2816	21.0821	-157.0974	X	X	X	
MHI	NII-2727	21.9541	-160.0586	X	X	X	
MHI	NII-2731	21.8606	-160.1463	X	X	X	X
MHI	NII-2732	21.8662	-160.1306	X	X	X	
MHI	NII-2733	21.8461	-160.1558	X		X	
MHI	NII-2735	21.8383	-160.1646	X	X	X	
MHI	NII-2738	21.8174	-160.1805	X		X	
MHI	NII-2742	22.0099	-160.0757	X	X	X	
MHI	NII-2744	22.0252	-160.0977	X	X	X	
MHI	NII-2754	21.9516	-160.1787	X		X	
MHI	NII-2756	21.9649	-160.1441		X	X	
MHI	NII-2759	21.8781	-160.2388	X		X	
MHI	NII-2760	21.9094	-160.2279	X		X	
MHI	NII-2774	21.8707	-160.1413	X		X	
MHI	NII-2781	21.9987	-160.1265	X	X	X	
MHI	NII-2785	22.0057	-160.083		X	X	

Region	Site ID	Latitude	Longitude	Fish SPC	Benthic SfM	Photo-quad	CTD/ H <sub>2</sub> O
MHI	NII-2786	22.003	-160.0646	X	X	X	
MHI	NII-2791	21.7933	-160.2371	X	X	X	
MHI	NII-2793	21.9352	-160.2016	X		X	X
MHI	NII-2794	21.8923	-160.2334	X	X	X	
MHI	NII-2798	21.9326	-160.1704	X	X	X	
MHI	NII-2801	21.9455	-160.1628	X		X	
MHI	NII-2806	21.9074	-160.2171	X		X	
MHI	NII-2808	21.8131	-160.2507	X		X	
MHI	NII-2813	21.8796	-160.1101	X	X	X	X
MHI	NII-2816	21.9962	-160.0543	X	X	X	
MHI	NII-2818	21.9988	-160.1039	X	X	X	
MHI	NII-2821	21.9214	-160.1897	X	X	X	
MHI	NII-2831	21.8608	-160.2471	X	X	X	X
MHI	NII-2832	21.862	-160.2429	X	X	X	
MHI	NII-2840	21.8341	-160.2479	X	X	X	
MHI	NII-2843	21.8356	-160.1762	X	X	X	
MHI	NII-2844	21.8108	-160.1893	X	X	X	
MHI	NII-2853	21.869	-160.2344	X	X	X	
MHI	OAH-4257	21.3981	-157.6867	X	X	X	
MHI	OAH-4258	21.3921	-157.6841		X	X	
MHI	OAH-4263	21.2734	-157.6855	X	X	X	
MHI	OAH-4265	21.3626	-157.6716	X	X	X	
MHI	OAH-4269	21.3711	-157.6786		X	X	

Region	Site ID	Latitude	Longitude	Fish SPC	Benthic SfM	Photo-quad	CTD/ H <sub>2</sub> O
MHI	OAH-4275	21.5674	-158.2753	X	X	X	
MHI	OAH-4277	21.5565	-158.261	X	X	X	
MHI	OAH-4282	21.59	-158.2346	X		X	
MHI	OAH-4286	21.5926	-157.8711	X	X	X	
MHI	OAH-4288	21.4779	-157.775	X	X	X	
MHI	OAH-4295	21.7019	-158.0328	X	X	X	
MHI	OAH-4297	21.5928	-158.1553	X	X	X	
MHI	OAH-4302	21.2717	-157.8453	X		X	
MHI	OAH-4303	21.4405	-158.2029	X		X	
MHI	OAH-4304	21.2521	-157.752	X	X	X	
MHI	OAH-4309	21.3763	-158.1539	X			
MHI	OAH-4317	21.2822	-157.8603	X		X	
MHI	OAH-4322	21.294	-157.6496	X	X	X	
MHI	OAH-4325	21.3931	-157.6946	X		X	
MHI	OAH-4326	21.3768	-157.6891	X	X	X	
MHI	OAH-4328	21.317	-157.6572	X	X	X	
MHI	OAH-4334	21.5883	-158.2248		X	X	
MHI	OAH-4337	21.5908	-158.2101	X	X	X	
MHI	OAH-4339	21.5834	-158.2499	X	X	X	
MHI	OAH-4343	21.5796	-157.856	X	X	X	
MHI	OAH-4347	21.6463	-157.9094	X			
MHI	OAH-4349	21.4738	-157.7925	X	X	X	
MHI	OAH-4350	21.605	-157.8844	X	X	X	

Region	Site ID	Latitude	Longitude	Fish SPC	Benthic SfM	Photo-quad	CTD/ H <sub>2</sub> O
MHI	OAH-4351	21.5165	-157.8104	X	X	X	
MHI	OAH-4352	21.6625	-157.9189	X			
MHI	OAH-4353	21.5715	-157.8476	X		X	
MHI	OAH-4354	21.4995	-157.8047	X	X	X	
MHI	OAH-4356	21.6805	-157.9239	X			
MHI	OAH-4358	21.6154	-158.1065	X	X	X	
MHI	OAH-4363	21.6792	-158.0433	X	X	X	
MHI	OAH-4364	21.5862	-158.1511	X		X	
MHI	OAH-4365	21.5915	-158.1396	X	X	X	
MHI	OAH-4368	21.6007	-158.1243	X	X	X	
MHI	OAH-4372	21.293	-157.8767	X	X	X	
MHI	OAH-4381	21.2642	-157.7355	X	X	X	
MHI	OAH-4382	21.265	-157.7252	X	X	X	
MHI	OAH-4383	21.4298	-158.1943	X	X	X	
MHI	OAH-4384	21.2546	-157.7778	X	X	X	
MHI	OAH-4388	21.3937	-158.1797	X	X	X	
MHI	OAH-4389	21.2879	-158.111	X	X	X	
MHI	OAH-4390	21.2788	-158.0539	X	X	X	
MHI	OAH-4393	21.4746	-158.2262	X	X	X	
MHI	OAH-4394	21.5355	-158.2331	X	X	X	
MHI	OAH-4395	21.3244	-158.1339	X	X	X	
MHI	OAH-4400	21.3226	-157.6679	X	X	X	
MHI	OAH-4401	21.2886	-157.6611	X	X	X	

Region	Site ID	Latitude	Longitude	Fish SPC	Benthic SfM	Photo-quad	CTD/ H <sub>2</sub> O
MHI	OAH-4407	21.5817	-158.2372	X	X	X	
MHI	OAH-4408	21.5856	-158.1988	X	X	X	
MHI	OAH-4415	21.6208	-157.9053	X	X	X	
MHI	OAH-4420	21.5028	-157.8147	X	X	X	
MHI	OAH-4422	21.5581	-157.8449		X	X	
MHI	OAH-4426	21.5955	-157.8819		X	X	
MHI	OAH-4433	21.6755	-157.9324		X	X	
MHI	OAH-4452	21.5435	-157.8365	X	X	X	
MHI	OAH-4459	21.6614	-158.0569	X	X	X	
MHI	OAH-4463	21.6075	-158.1053	X	X	X	
MHI	OAH-4469	21.2937	-157.8704	X		X	
MHI	OAH-4472	21.341	-158.1291	X	X	X	
MHI	OAH-4474	21.2958	-158.0109	X			
MHI	OAH-4477	21.3854	-158.1527	X	X	X	
MHI	OAH-4479	21.293	-158.0503	X	X	X	
MHI	OAH-4488	21.4944	-158.2311	X	X	X	
MHI	OAH-4489	21.2641	-157.7747	X	X	X	
MHI	OAH-4490	21.458	-158.2083	X	X	X	
MHI	OAH-4494	21.2728	-157.8373	X		X	
NWHI	FFS-4659	23.8075	-166.0785	X		X	
NWHI	FFS-4662	23.8431	-166.1275	X		X	
NWHI	FFS-4664	23.8227	-166.0968	X		X	
NWHI	FFS-4665	23.6781	-166.0633	X	X	X	

Region	Site ID	Latitude	Longitude	Fish SPC	Benthic SfM	Photo-quad	CTD/ H <sub>2</sub> O
NWHI	FFS-4667	23.6244	-166.1172	X	X	X	
NWHI	FFS-4669	23.8744	-166.3183	X		X	
NWHI	FFS-4672	23.8852	-166.2456	X		X	
NWHI	FFS-4679	23.8677	-166.3391	X	X	X	
NWHI	FFS-4684	23.8337	-166.127	X	X	X	
NWHI	FFS-4703	23.6726	-166.1746	X	X	X	
NWHI	FFS-4717	23.8528	-166.3479		X	X	
NWHI	FFS-4723	23.8308	-166.3339	X	X	X	
NWHI	FFS-4734	23.7994	-166.2545	X	X	X	
NWHI	FFS-4736	23.7575	-166.2328	X	X	X	
NWHI	FFS-4744	23.7692	-166.3037	X	X	X	X
NWHI	FFS-4746	23.7971	-166.2903	X	X	X	
NWHI	FFS-4748	23.8105	-166.0883	X		X	X
NWHI	FFS-4750	23.6387	-166.1745	X	X	X	
NWHI	FFS-4752	23.8686	-166.3174	X	X	X	
NWHI	FFS-4755	23.6382	-166.1694	X		X	
NWHI	FFS-4757	23.8365	-166.1233	X	X	X	
NWHI	FFS-4760	23.8775	-166.2888	X		X	
NWHI	FFS-4762	23.6326	-166.1016	X		X	
NWHI	FFS-4769	23.8811	-166.2514	X	X	X	
NWHI	FFS-4772	23.6345	-166.1576	X		X	
NWHI	FFS-4774	23.8745	-166.3	X	X	X	
NWHI	FFS-4775	23.6688	-166.0753	X		X	

Region	Site ID	Latitude	Longitude	Fish SPC	Benthic SfM	Photo-quad	CTD/ H <sub>2</sub> O
NWHI	FFS-4777	23.6852	-166.0676	X	X	X	X
NWHI	FFS-4786	23.8181	-166.0932	X	X	X	
NWHI	FFS-4791	23.6248	-166.1323	X		X	
NWHI	FFS-4793	23.7794	-166.0681	X		X	X
NWHI	FFS-4795	23.6568	-166.079	X		X	
NWHI	FFS-4798	23.8015	-166.0753	X	X	X	X
NWHI	FFS-4804	23.6295	-166.1145	X		X	
NWHI	FFS-4818	23.8104	-166.2119	X	X	X	X
NWHI	FFS-4831	23.8381	-166.2872	X	X	X	
NWHI	FFS-4832	23.8246	-166.2544		X	X	
NWHI	FFS-4836	23.8529	-166.3284	X	X	X	X
NWHI	FFS-4840	23.8522	-166.3363	X	X	X	
NWHI	FFS-4841	23.8267	-166.291	X	X	X	
NWHI	FFS-4848	23.8401	-166.1383	X		X	
NWHI	FFS-4855	23.8124	-166.0959	X		X	
NWHI	FFS-4856	23.8773	-166.2752	X	X	X	
NWHI	FFS-4863	23.8758	-166.2826		X	X	
NWHI	FFS-4869	23.8484	-166.1481	X		X	
NWHI	FFS-4875	23.8562	-166.1907	X	X	X	
NWHI	FFS-4876	23.7899	-166.2171	X	X	X	X
NWHI	FFS-4879	23.8687	-166.2568	X	X	X	
NWHI	KUR-4252	28.385	-178.3642	X	X	X	X
NWHI	KUR-4255	28.4494	-178.2966	X	X	X	X

Region	Site ID	Latitude	Longitude	Fish SPC	Benthic SfM	Photo-quad	CTD/ H <sub>2</sub> O
NWHI	KUR-4256	28.3877	-178.3698		X	X	
NWHI	KUR-4258	28.4371	-178.371	X	X	X	
NWHI	KUR-4260	28.4121	-178.3819	X	X	X	X
NWHI	KUR-4263	28.4141	-178.3805		X	X	
NWHI	KUR-4265	28.3827	-178.3539		X	X	
NWHI	KUR-4266	28.3958	-178.374	X	X	X	
NWHI	KUR-4268	28.4291	-178.3763	X	X	X	X
NWHI	KUR-4269	28.3903	-178.3729		X	X	X
NWHI	KUR-4270	28.3927	-178.2809		X	X	
NWHI	KUR-4272	28.4562	-178.3298	X	X	X	
NWHI	KUR-4275	28.3818	-178.3196	X	X	X	
NWHI	KUR-4280	28.3866	-178.3511				X
NWHI	KUR-4281	28.4552	-178.3398	X	X	X	
NWHI	KUR-4289	28.423	-178.3763	X	X	X	X
NWHI	KUR-4291	28.3832	-178.3035	X	X	X	
NWHI	KUR-4296	28.4558	-178.3173	X	X	X	X
NWHI	KUR-4300	28.3845	-178.3329	X	X	X	X
NWHI	KUR-4302	28.398	-178.3663	X	X	X	
NWHI	KUR-4306	28.3864	-178.2888	X	X	X	
NWHI	KUR-4308	28.4501	-178.3038	X	X	X	X
NWHI	KUR-4312	28.4448	-178.3585	X	X	X	
NWHI	KUR-4318	28.4397	-178.2906	X	X	X	
NWHI	KUR-4320	28.4117	-178.3513	X	X	X	

Region	Site ID	Latitude	Longitude	Fish SPC	Benthic SfM	Photo-quad	CTD/ H <sub>2</sub> O
NWHI	KUR-4322	28.399	-178.3488	X	X	X	X
NWHI	KUR-4323	28.4147	-178.3457	X	X	X	X
NWHI	KUR-4332	28.4462	-178.3533	X	X	X	
NWHI	KUR-4333	28.3847	-178.2997	X	X	X	
NWHI	KUR-4335	28.3907	-178.2865	X	X	X	
NWHI	KUR-4337	28.3981	-178.3605	X	X	X	
NWHI	KUR-4338	28.4038	-178.3689	X		X	
NWHI	KUR-4343	28.452	-178.3083	X		X	X
NWHI	KUR-4349	28.4105	-178.3713	X	X	X	
NWHI	KUR-4352	28.436	-178.3181	X	X	X	
NWHI	KUR-4353	28.3939	-178.3504	X	X	X	X
NWHI	KUR-4354	28.4101	-178.2927	X	X	X	
NWHI	KUR-4355	28.4075	-178.325	X	X	X	
NWHI	KUR-4362	28.42	-178.2832	X	X	X	X
NWHI	KUR-4364	28.4023	-178.2765	X	X	X	X
NWHI	KUR-4365	28.3981	-178.2826	X	X	X	X
NWHI	LIS-4507	26.0335	-173.8439	X	X	X	
NWHI	LIS-4516	25.9297	-173.9667	X		X	X
NWHI	LIS-4523	25.9842	-174.0435	X		X	X
NWHI	LIS-4524	25.9044	-173.949	X	X	X	
NWHI	LIS-4525	25.9869	-174.0234	X	X	X	X
NWHI	LIS-4529	25.9435	-174.0427	X	X	X	
NWHI	LIS-4531	26.0495	-173.8876	X	X	X	

Region	Site ID	Latitude	Longitude	Fish SPC	Benthic SfM	Photo-quad	CTD/ H <sub>2</sub> O
NWHI	LIS-4536	26.001	-173.8345	X	X	X	X
NWHI	LIS-4538	25.9248	-173.8985	X	X	X	
NWHI	LIS-4539	25.9655	-174.0934	X		X	
NWHI	LIS-4542	25.9462	-173.8655	X	X	X	
NWHI	LIS-4544	26.056	-174.0338	X	X	X	
NWHI	LIS-4545	25.969	-174.0088	X	X	X	
NWHI	LIS-4547	25.9521	-174.0481	X	X	X	
NWHI	LIS-4548	26.0733	-174.0309	X	X	X	
NWHI	LIS-4559	25.9875	-173.8476	X		X	
NWHI	LIS-4561	26.0874	-174.0045	X	X	X	X
NWHI	LIS-4566	25.9093	-173.9069	X		X	X
NWHI	LIS-4567	26.0405	-174.0549	X	X	X	
NWHI	LIS-4571	25.9466	-174.0646	X	X	X	X
NWHI	LIS-4574	26.1223	-173.9856	X	X	X	
NWHI	LIS-4575	26.0784	-174.0543	X	X	X	X
NWHI	LIS-4579	25.9234	-173.9399	X	X	X	
NWHI	LIS-4581	25.9736	-173.9617	X	X	X	
NWHI	LIS-4582	26.0034	-174.0209	X	X	X	X
NWHI	LIS-4588	25.9806	-173.8674	X	X	X	
NWHI	LIS-4592	26.0176	-173.8872	X	X	X	
NWHI	LIS-4595	26.0097	-173.8702	X	X	X	
NWHI	LIS-4597	25.9997	-173.9752	X	X	X	X
NWHI	LIS-4606	25.9443	-173.8842	X	X	X	

Region	Site ID	Latitude	Longitude	Fish SPC	Benthic SfM	Photo-quad	CTD/ H <sub>2</sub> O
NWHI	LIS-4608	26.071	-173.9641	X	X	X	
NWHI	LIS-4617	26.0526	-173.9634	X	X	X	
NWHI	LIS-4618	26.0137	-173.9694	X	X	X	
NWHI	LIS-4619	26.0574	-174.0264	X	X	X	
NWHI	LIS-4621	26.0255	-174.0349	X	X	X	
NWHI	LIS-4622	26.1002	-173.9428	X	X	X	
NWHI	LIS-4623	26.1057	-173.9723	X	X	X	
NWHI	LIS-4624	26.0871	-173.9311	X	X	X	X
NWHI	LIS-4625	26.0666	-173.9948	X	X	X	
NWHI	LIS-4626	26.0516	-174.0077	X		X	
NWHI	LIS-4627	26.067	-173.9471	X		X	
NWHI	LIS-4643	25.9762	-173.9606	X	X	X	
NWHI	LIS-4644	25.9421	-173.9868	X	X	X	X
NWHI	LIS-4645	25.9849	-174.0257	X	X	X	
NWHI	PHR-4517	27.9598	-175.8206	X	X	X	
NWHI	PHR-4520	27.8815	-175.9528	X	X	X	X
NWHI	PHR-4523	27.7903	-176.0015		X	X	X
NWHI	PHR-4528	27.8484	-175.9982	X	X	X	
NWHI	PHR-4533	27.8218	-175.9983		X	X	
NWHI	PHR-4544	27.7849	-175.8302		X	X	
NWHI	PHR-4547	27.8754	-175.9711	X	X	X	
NWHI	PHR-4549	27.9375	-175.8742		X	X	
NWHI	PHR-4552	27.8107	-176.0016	X	X	X	

Region	Site ID	Latitude	Longitude	Fish SPC	Benthic SfM	Photo-quad	CTD/ H <sub>2</sub> O
NWHI	PHR-4558	27.8631	-175.9727	X	X	X	
NWHI	PHR-4559	27.8405	-176.006	X	X	X	
NWHI	PHR-4560	27.9092	-175.9165	X	X	X	
NWHI	PHR-4565	27.7644	-175.913	X	X	X	
NWHI	PHR-4567	27.964	-175.8028	X	X	X	
NWHI	PHR-4569	27.8435	-175.9903	X	X	X	
NWHI	PHR-4577	27.7706	-175.9787	X	X	X	
NWHI	PHR-4583	27.9028	-175.9175	X		X	
NWHI	PHR-4586	27.8512	-175.9616	X	X	X	
NWHI	PHR-4591	27.7749	-175.9829	X	X	X	
NWHI	PHR-4600	27.7889	-175.8729	X	X	X	
NWHI	PHR-4619	27.9504	-175.8387	X	X	X	
NWHI	PHR-4629	27.9346	-175.87	X	X	X	
NWHI	PHR-4638	27.8913	-175.831	X	X	X	
NWHI	PHR-4640	27.867	-175.8961	X	X	X	
NWHI	PHR-4648	27.8167	-175.9617	X	X	X	
NWHI	PHR-4682	27.7574	-175.9636	X	X	X	
NWHI	PHR-4683	27.8932	-175.9359	X	X	X	
NWHI	PHR-4684	27.9567	-175.8172	X	X	X	
NWHI	PHR-4689	27.9504	-175.82	X	X	X	
NWHI	PHR-4691	27.8324	-175.8904	X	X	X	
NWHI	PHR-4692	27.7931	-175.9856	X	X	X	
NWHI	PHR-4705	27.7807	-175.7833	X	X	X	

Region	Site ID	Latitude	Longitude	Fish SPC	Benthic SfM	Photo-quad	CTD/ H <sub>2</sub> O
NWHI	PHR-4708	27.7929	-175.8583	X	X	X	
NWHI	PHR-4710	27.7865	-175.7778	X	X	X	
NWHI	PHR-4711	27.7892	-175.852	X	X	X	
NWHI	PHR-4714	27.7865	-175.8242	X	X	X	
NWHI	PHR-4715	27.7837	-175.8047	X	X	X	
NWHI	PHR-4717	27.7791	-175.8866	X	X	X	
NWHI	PHR-4719	27.7676	-175.9054	X	X	X	
NWHI	PHR-4721	27.9286	-175.8823		X	X	
NWHI	PHR-4722	27.9218	-175.8875	X	X	X	

**Table 2.** Summary of fixed site activities on SE-24-06 in the main Hawaiian Islands (MHI; Leg I) and Northwestern Hawaiian Islands (NWHI; leg II). Abbreviations refer to: CTD = Conductivity, Temperature, Depth profiles; H<sub>2</sub>O = carbonate chemistry water samples; CAU = Calcification Accretion Units; BMU = Bioerosion Monitoring Units; SfM = Structure-from-Motion.

Region	OCC Site ID	Latitude	Longitude	CTD/ H <sub>2</sub> O	STR Deploy	STR Retrieve	CAU Deploy	CAU Retrieve	BMU Deploy	BMU Retrieve	Fixed SfM	Carb. Budgets
MHI	OCC-HAW-001	20.2703	-155.8609	X	X	X						
MHI	OCC-HAW-002	20.2682	-155.8604	X	X	X	X	X	X	X	X	X
MHI	OCC-HAW-003	19.7469	-155.0580	X	X		X		X		X	X
MHI	OCC-HAW-009	19.2442	-155.9005	X	X	X						
MHI	OCC-HAW-010	19.2443	-155.9003	X	X	X	X	X	X	X	X	X
MHI	OCC-HAW-011	19.2443	-155.9000	X	X	X						
MHI	OCC-HAW-021	19.7512	-155.0526	X	X							
MHI	OCC-HAW-022	19.7430	-155.0618	X	X							

Region	OCC Site ID	Latitude	Longitude	CTD/ H <sub>2</sub> O	STR Deploy	STR Retrieve	CAU Deploy	CAU Retrieve	BMU Deploy	BMU Retrieve	Fixed SfM	Carb. Budgets
MHI	OCC-KAH-001	20.6004	-156.5603	X							X	X
MHI	OCC-KAU-003	21.8757	-159.5255	X	X	X						
MHI	OCC-KAU-004	21.8766	-159.5257	X	X	X	X	X				
MHI	OCC-KAU-005	21.8822	-159.5255	X	X	X						
MHI	OCC-KAU-006	22.1715	-159.6870	X	X	X						
MHI	OCC-KAU-007	22.1685	-159.6858	X	X	X	X	X			X	X
MHI	OCC-KAU-008	22.1635	-159.6861	X	X							
MHI	OCC-LAN-003	20.7358	-156.9156	X	X	X	X	X			X	X
MHI	OCC-LAN-004	20.7373	-156.9162	X	X							
MHI	OCC-MAI-001	20.8700	-156.1453	X	X	X						
MHI	OCC-MAI-002	20.8687	-156.1463	X	X	X	X	X			X	X
MHI	OCC-MAI-005	21.0074	-156.6678	X	X	X	X	X				

Region	OCC Site ID	Latitude	Longitude	CTD/ H <sub>2</sub> O	STR Deploy	STR Retrieve	CAU Deploy	CAU Retrieve	BMU Deploy	BMU Retrieve	Fixed SfM	Carb. Budgets
MHI	OCC-MAI-006	20.9519	-156.6919	X	X	X						
MHI	OCC-MAI-016	20.7985	-156.6126	X	X							
MHI	OCC-MAI-017	20.8045	-156.6072	X	X		X				X	X
MHI	OCC-MAI-018	20.8060	-156.6052	X	X							
MHI	OCC-MAI-019	20.8669	-156.1457	X	X							
MHI	OCC-MOL-002	21.1787	-156.7606	X	X	X						
MHI	OCC-MOL-003	21.1769	-156.7604	X	X	X	X	X			X	
MHI	OCC-MOL-004	21.1757	-156.7607	X	X							
MHI	OCC-MOL-005	21.0356	-156.8905	X	X		X	X				
MHI	OCC-MOL-006	21.0830	-157.0642	X	X		X	X			X	X
MHI	OCC-MOL-007	21.1347	-157.3060	X	X	X						
MHI	OCC-MOL-008	21.1341	-157.3003	X	X	X	X	X				

Region	OCC Site ID	Latitude	Longitude	CTD/ H <sub>2</sub> O	STR Deploy	STR Retrieve	CAU Deploy	CAU Retrieve	BMU Deploy	BMU Retrieve	Fixed SfM	Carb. Budgets
MHI	OCC-NII-001	21.9414	-160.0701	X	X		X	X			X	X
MHI	OCC-NII-002	21.9016	-160.2376	X	X	X						
MHI	OCC-NII-003	21.8975	-160.2340	X	X		X	X				
MHI	OCC-NII-004	21.8923	-160.2303	X	X							
MHI	OCC-OAH-001	21.5926	-158.1746	X	X	X						
MHI	OCC-OAH-002	21.5909	-158.1747	X	X	X					X	X
MHI	OCC-OAH-004	21.4831	-157.7808	X	X	X						
MHI	OCC-OAH-005	21.4798	-157.7830	X	X	X	X	X	X	X	X	X
MHI	OCC-OAH-006	21.4736	-157.7881	X	X	X						
MHI	OCC-OAH-007	21.4585	-157.7987	X	X	X	X	X	X	X		
MHI	OCC-OAH-009	21.2848	-157.8679	X	X	X						
MHI	OCC-OAH-010	21.2883	-157.8654	X	X	X	X	X	X	X	X	X

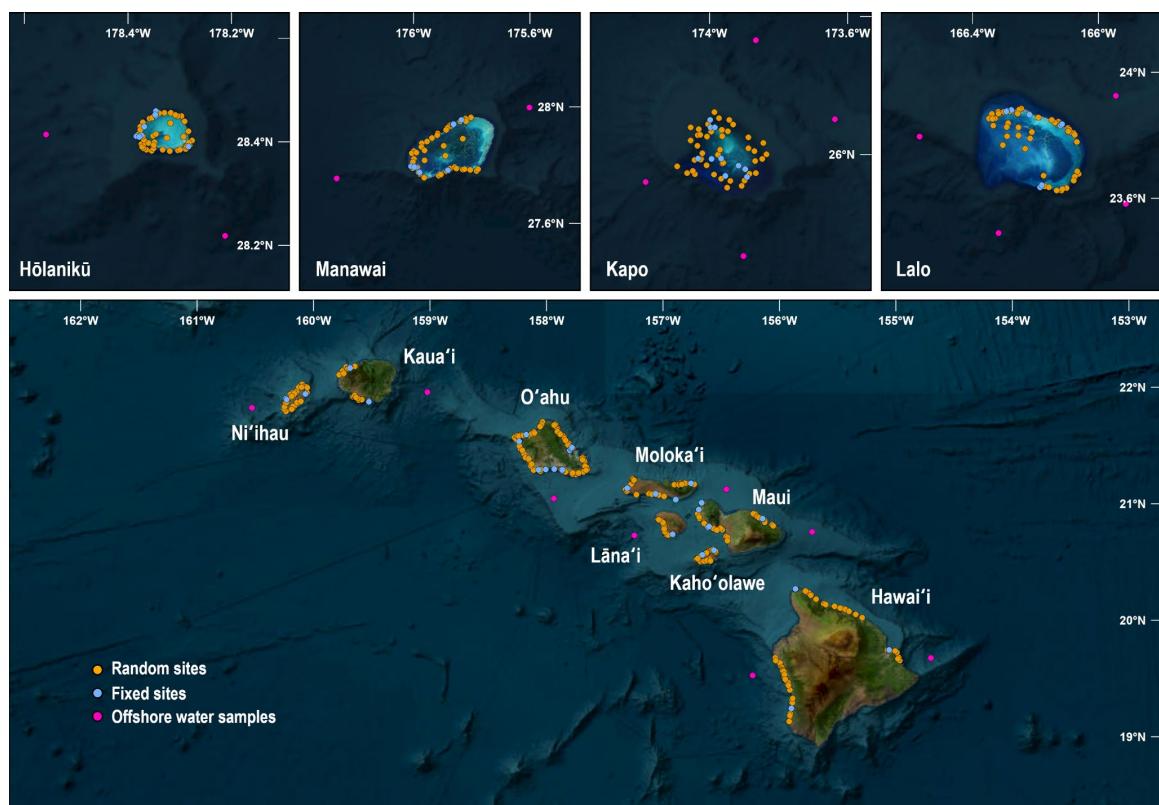
Region	OCC Site ID	Latitude	Longitude	CTD/ H <sub>2</sub> O	STR Deploy	STR Retrieve	CAU Deploy	CAU Retrieve	BMU Deploy	BMU Retrieve	Fixed SfM	Carb. Budgets
MHI	OCC-OAH-011	21.2900	-157.8638	X	X							
MHI	OCC-OAH-012	21.5341	-158.2345	X	X	X	X	X	X	X	X	X
MHI	OCC-OAH-038	21.2981	-157.9334	X	X	X					X	X
MHI	OCC-OAH-039	21.2934	-158.0058	X	X	X					X	X
MHI	OCC-OAH-040	21.2902	-158.0667	X	X	X					X	X
NWHI	OCC-FFS-001	23.8785	-166.2909	X	X	X						
NWHI	OCC-FFS-002	23.8781	-166.2910	X	X	X	X	X	X	X	X	X
NWHI	OCC-FFS-003	23.8755	-166.2922	X	X							
NWHI	OCC-FFS-004	23.8802	-166.2771	X				X				
NWHI	OCC-FFS-005	23.8661	-166.2197			X						
NWHI	OCC-FFS-007	23.8351	-166.1168	X	X	X	X	X	X	X	X	X
NWHI	OCC-FFS-008	23.8302	-166.1203	X	X	X						

Region	OCC Site ID	Latitude	Longitude	CTD/ H <sub>2</sub> O	STR Deploy	STR Retrieve	CAU Deploy	CAU Retrieve	BMU Deploy	BMU Retrieve	Fixed SfM	Carb. Budgets
NWHI	OCC-FFS-009	23.6349	-166.1857		X							
NWHI	OCC-FFS-010	23.6369	-166.1851	X	X	X	X		X		X	X
NWHI	OCC-FFS-011	23.6412	-166.1798	X	X							
NWHI	OCC-FFS-034	23.8355	-166.1155	X	X							
NWHI	OCC-KUR-001	28.4593	-178.3462	X	X	X						
NWHI	OCC-KUR-002	28.4529	-178.3471	X	X	X	X	X			X	X
NWHI	OCC-KUR-008	28.3906	-178.2828	X	X	X						
NWHI	OCC-KUR-012	28.4110	-178.3838	X	X	X						
NWHI	OCC-KUR-013	28.4091	-178.3781	X	X	X	X	X			X	X
NWHI	OCC-KUR-014	28.4129	-178.3744	X	X							
NWHI	OCC-KUR-015	28.4294	-178.3683	X	X	X						
NWHI	OCC-LIS-001	26.1001	-173.9980	X	X	X						

Region	OCC Site ID	Latitude	Longitude	CTD/ H <sub>2</sub> O	STR Deploy	STR Retrieve	CAU Deploy	CAU Retrieve	BMU Deploy	BMU Retrieve	Fixed SfM	Carb. Budgets
NWHI	OCC-LIS-002	26.0784	-173.9971	X	X	X	X	X			X	X
NWHI	OCC-LIS-003	26.0786	-173.9847		X	X						
NWHI	OCC-LIS-007	25.9347	-173.8913	X	X	X						
NWHI	OCC-LIS-008	25.9351	-173.8911	X	X		X	X				
NWHI	OCC-LIS-009	25.9571	-173.8961	X	X							
NWHI	OCC-LIS-010	25.9677	-173.9159	X	X	X						
NWHI	OCC-LIS-011	25.9383	-173.9541	X				X				
NWHI	OCC-LIS-012	25.9881	-174.0330	X	X	X						
NWHI	OCC-LIS-013	25.9872	-173.9944	X	X	X	X	X			X	X
NWHI	OCC-LIS-014	25.9880	-173.9660	X	X	X						
NWHI	OCC-PHR-001	27.9424	-175.8635	X	X	X						
NWHI	OCC-PHR-002	27.9406	-175.8617	X	X	X	X		X		X	X

Region	OCC Site ID	Latitude	Longitude	CTD/ H <sub>2</sub> O	STR Deploy	STR Retrieve	CAU Deploy	CAU Retrieve	BMU Deploy	BMU Retrieve	Fixed SfM	Carb. Budgets
NWHI	OCC-PHR-003	27.9376	-175.8634	X	X							
NWHI	OCC-PHR-004	27.9549	-175.8359	X				X		X		
NWHI	OCC-PHR-010	27.7818	-175.8809		X	X						
NWHI	OCC-PHR-011	27.7819	-175.8811	X	X	X						
NWHI	OCC-PHR-012	27.7824	-175.8820	X	X	X	X	X	X	X	X	X
NWHI	OCC-PHR-013	27.7834	-175.8833	X	X							
NWHI	OCC-PHR-014	27.7748	-175.9787		X	X						
NWHI	OCC-PHR-015	27.7958	-176.0085	X	X	X						
NWHI	OCC-PHR-016	27.7931	-175.9971	X	X	X	X	X	X	X	X	
NWHI	OCC-PHR-017	27.7923	-175.9916	X	X	X						

## FIGURES



**Figure 1.** Map of random and fixed sites surveyed during the FY25 NCRMP Hawaiian Archipelago mission, shown with locations of offshore water samples. O'ahu surveys were conducted during MP-24-04 in May-June 2024, and all other sites were surveyed as part of SE-24-06 leg I (Main Hawaiian Islands) and leg II (Northwestern Hawaiian Islands).