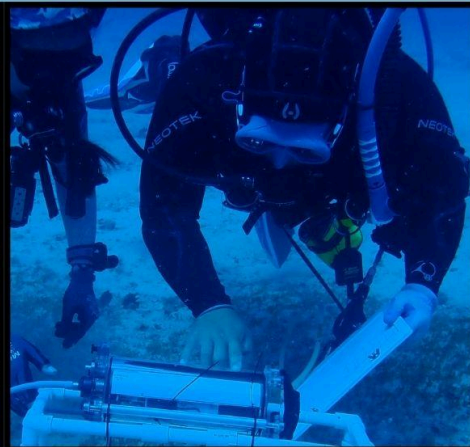




# Aquatic Invasive Species Program



## 2024 Accomplishment Report



COLLEGE OF SOCIAL SCIENCES

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SOCIAL SCIENCE  
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# **Aquatic Invasive Species Program 2024 Annual Accomplishment Report**

**State of Hawai`i  
Department of Land and Natural Resources  
Division of Aquatic Resources**

**In Cooperation with**

**The Research Corporation of the University of Hawai`i  
Pacific Cooperative Studies Unit  
And  
Social Science Research Institute**

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## AIS Field Team

### Overview

Invasive algae control has been one of the primary management priorities of the Department of Land and Natural Resources (DLNR) Division of Aquatic Resources (DAR) Aquatic Invasive Species (AIS) Team. The proliferation of introduced invasive algae throughout Kāneʻohe Bay poses a major threat to coral reef ecosystems. As a result, extensive invasive algae management has been instituted throughout Kāneʻohe Bay over the last decade. Past efforts included the manual removal of algae by divers using the “Super Sucker” underwater vacuum system followed by a biocontrol application: outplanting native sea urchins (*Tripneustes gratilla*) that were hatched and reared in the DAR Ānuenuue Fisheries Research Center (AFRC) on Sand Island, Oʻahu. The Aquatic Invasive Species Program began outplanting urchins to the Waikīkī Marine Life Conservation District (MLCD) with additional funding from the Kapalāma Terminal Expansion Project. To date, the AIS Program has treated 572,022 m<sup>2</sup> of reefs in Kāneʻohe Bay and the Waikīkī MLCD. Super Sucker operations are set to resume in 2025 in conjunction with the continuation of urchins as a biocontrol.

The AIS Team is also responsible for rapidly responding to reports of new non-native species introductions. Rapid response has been critical in preventing the establishment of newly introduced species. Once a species becomes established, eradicating it can be incredibly difficult, if not impossible. The AIS Team conducts various ecosystem monitoring and response efforts to help manage introduced species throughout the State. The AIS Team’s experience and ongoing efforts contribute to a wide range of steering committees, workshops, and training sessions focusing on AIS and marine resource management.

The AIS Team includes the Ballast Water and Biofouling (BWBF) Program. The BWBF Program’s main goals are to address the top two vectors of aquatic invasive species introductions to Hawai‘i: ballast water movement by vessels and biofouling on vessel hulls and other areas. A key project of the BWBF Program is collecting arrival data from all ballast-carrying commercial vessels, which the Team conducts a risk assessment on and generates data summaries that can be analyzed for new patterns or shared with collaborators and partners. The BWBF program has been occupied since the passing of the 2018 Vessel Incidental Discharge Act (VIDA) providing comments and consultation to the EPA and USCG on the rulemaking and enforcement development process. The BWBF Team has also been heavily involved in the past few years with the issue of Stony Coral Tissue Loss Disease (SCTLD), a potentially devastating disease that could be spread to Hawai‘i reefs through ballast water or biofouling. In working towards preventing the introduction of the disease and preparing for the possibility of its arrival, the team has addressed several key priorities for the State.

## Prevention

- Continued to address the prevention of *Chondria tumulosa* arrival in the Main Hawaiian Islands.
  - Led desiccation trials using *Acanthophora spicifera* as a proxy for *C. tumulosa* collected with marine debris from the Papahānaumokuākea Marine National Monument (PMNM).
  - Performed biosecurity inspection site visits for two potential trash disposal sites for the Papahānaumokuākea Marine Debris Project (PMDP) and supervised subsequent offload of derelict vessels.
  - Inspected the offload of buoy chains collected by the US Coast Guard in the Nuisance Algae Mitigation Zone of the PMNM.
- Contacted all pet stores on O‘ahu to inform them of a zebra mussel protocol breach in Washington State that could reach other states.
- Distributed pamphlets and other outreach material to all pet stores on O‘ahu to promote the new aquatic-specific “Don’t Let It Loose” (DLIL) campaign.



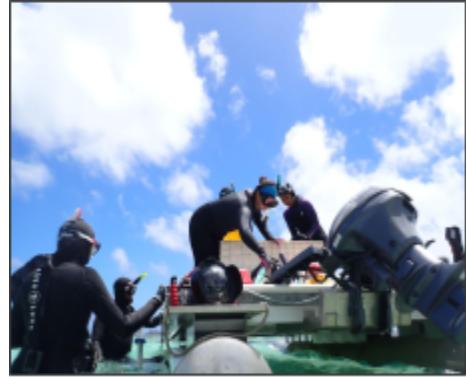
AIS team members performing desiccation trials

## Ballast Water and Biofouling Program

- Collected and analyzed ballast water data from 946 vessel arrivals in 2023 for presentation at the 2024 Pacific Ballast Water Group Meeting.
- Collected ballast water reporting forms from 980 vessel arrivals in 2024.
- Worked with West Coast states on PAC-DASH, a ballast water data collaboration.
- Collaborated with NOAA on snorkel and SCUBA hull inspections as part of permit applications for entry to the PMNM.
- Consulted with NOAA on a new biofouling risk assessment for vessel entry permit applications for the PMNM.
- Conducted recreational vessel hull fouling surveys at 15 different small boat harbors across Oahu, Hawai‘i Island, Maui, and Kauai to gather information about hull husbandry practices, voyage history, and general knowledge of biofouling and aquatic invasive species; surveyed a total of 1,495 vessels and 21 harbor users.
- Provided consultation for the US Coast Guard during their quarterly VIDA state engagement meetings and provided official follow-up comments to topics discussed.
- Received a 2024 Hawai‘i Invasive Species Council award to fund the BWBF Program.
- Organized and facilitated a May 2024 Alien Aquatic Organism Task Force Meeting with representatives and stakeholders from federal & state agencies, non-profit organizations, and vessel industry companies.

## Early Detection and Rapid Response

- Removed non-native *Montipora foliosa* and *Montipora stellata* coral colonies from Reef 8 in Kāneʻohe Bay. Scheduled biannual and annual follow-up surveys to assess removal success.
- Responded to reports of *Anemonia manjano* in Kāneʻohe Bay and conducted comprehensive snorkel surveys to delimit the spread of the invasive species.
  - Formed an interagency working group to create a response plan and began working on next steps for eradication.
  - Created Structure from Motions (SfM) photomosaics to quantify the infestation and impacted native stony corals.
  - Began necessary preconsultation with State permitting entities to pursue removal.
- Conducted snorkel and SCUBA delineation surveys around Kualoa Beach Park and Mokoliʻi Island due to reports of a potential non-native soft coral.
- Investigated a report of potential coral disease at Makai Pier.
- Collected samples of potentially non-native *Terrazoanthus sp.* at Heʻeia Harbor and Kualoa Beach Park.
- Investigated reports of potentially non-native *Acropora sp.* coral in Laie. Surveyed area and collected samples for genetic identification.
- Responded to potential sighting of *Unomia stolonifera* near Airport Runway within State nearshore waters. Initiated new discussion about targeted delimiting survey strategies within higher priority sites within the Pearl Harbor Security Zone.



Removal of *M. foliosa* from Reef 8 in Kāneʻohe Bay



Soft coral surveys from Kualoa Beach Park

## Control and Monitoring

- Performed surveys of the Nuʻuanu Stream area to investigate the spread of a non-native aquatic plant, Manatee Mudflower (*Micranthemum glomeratum*).
- Collaborated with partners on information sharing regarding the Super Sucker program and discussed potential utilization of the methodology to be



Manatee Mudflower survey from Nuʻuanu Stream area 6

modified for the invasive soft coral *Xenia umbellata* with the Puerto Rico Department of Natural and Environmental Resources.

- Conducted annual follow-up surveys for *Discosomma nummiforme* in the Ala Wai Small Boat Harbor.
- Conducted annual SNAP surveys to monitor invasive algae in Kāneʻohe Bay and the Waikīkī MLCD.
- Retrained employees on the Super Sucker system to anticipate invasive algae removal in Kāneʻohe Bay. Applied for Special Activity Permit for operations.
- Continued biocontrol management of invasive algae by outplanting 57,879 hatchery-raised juvenile sea urchins to 71,150 m<sup>2</sup> of reef in Kāneʻohe Bay.
- Assisted the DAR Coral Nursery Team with coral module outplants and independently monitored modules.
- Continued developing structure from motion (SfM) analysis of coral outplant sites as part of efforts to expand large-scale imaging programs for mapping coral modules and assessing invasive *Anemonia manjano*.



SfM monitoring of an invasive *M. foliosa* colony

### Vessel Groundings/Restoration

- Assisted Kuleana Coral Restoration with the emergency restoration and post-monitoring of outplanted corals of opportunity in Kewalo Basin.
- Surveyed coral damage following P8 plane grounding at Marine Corps Base Hawaii, including delineating impact area, reference sites, and characterizing damage.
- Investigated reported damage on a patch reef in Kāneʻohe Bay due to an unknown vessel.



Measurement of vessel scar from P3 in Kāneʻohe Bay

### Partner Collaboration

- Participated in collaborative Hawaiʻi Octocoral Working Group meetings to discuss surveys, funding, outreach, and other matters relevant to the *Unomia stolonifera* response in Pearl Harbor.

- Provided support for Mālama Maunalua with an urchin caging experiment in Maunalua Bay by outplanting urchin cages at known invasive algae hot spots.
- Assisted Dr. Nancy Treneman by deploying wood panels around O‘ahu for shipworm experiments.
- Participated in a workshop with the University of Hawai‘i at Mānoa Smith Lab with chemical injections of *Avrainvillea lacerata* at Kualoa Beach Park to test novel eradication methods.
- Provided support to the US Navy during the disposal of unexploded ordnance in Kāne‘ohe Bay to ensure no endangered or protected species were present.
- Partnered with NOAA on a rubble stabilization project at Barbers Point by providing DAR dive and boat support.

### Staff and Facilities

- Hired one full-time Habitat and Fish Monitoring Technician (Ciara Ratum).
- Hired two full-time Research Technicians focusing on invasive soft corals (Landon Keller, Sydney Cook).
- Hired one full-time Aquatic Biologist II (Kate Gonzalez).
- Hired one full-time Kupu placement through the Conservation Leadership Development Program (Kristian Kim).
- Hired one full-time AIS Rapid Response Coordinator (Eric Dilley).

### Priorities for 2025

- Promote early detection of incipient introduced species and rapidly respond to reports.
- Continue processing species on the AIS Preborder Database and the Hawai‘i Prevention Priority Distribution List as part of efforts to create a response prioritization tool for effectively allocating AIS efforts.
- Continue monitoring coral and invasive algal cover to guide and expand future urchin outplanting efforts in Kāne‘ohe Bay.
- Proceed with removal efforts of *Anemonia manjano* in Kāne‘ohe Bay with the goal of eradication. Collaborate with NERR, HIMB, DoD, and other partners on removal, outreach, and future monitoring efforts.
- Create a collaborative interagency database for *Unomia stolonifera* presence/absence to track detections and survey efforts statewide.
- Continue monitoring outplanted corals and incorporate new monitoring methodologies, such as large-scale imaging for the Kapalāma Terminal Expansion Project.



AIS field team member prepares for a dive to monitor coral outplants

- Assist and support neighbor islands with AIS concerns.
- Continue collaborating with partner agencies and organizations to better support AIS management and mitigation.
- Share rapid response data at local and national conferences.
- Publish AIS detections in journals or global databases to improve data sharing amongst agencies.
- Expand collaborative efforts with co-managers to better manage the Nuisance Algae Management Zone within Papahānaumokuākea Marine National Monument.

## Outreach

- Presentations
  - Boord, Jesse
    - CGAPS 4th Quarter Meeting (December 2024): Presented Majano anemone response plan
    - Majano Anemone Response Meeting (December 2024): Presented Majano anemone response plan
  - Branco, Ciara & Gonzalez, Kate
    - Ewa Makai Middle School (February 2024) AIS Overview to 2 classes of middle school students (~40 students)
  - Dilley, Eric
    - Reef Futures (December 2024) Monitoring of Hawai‘i Division of Aquatic Resources coral outplants off the South Shore of O‘ahu, Hawai‘i
  - Gonzalez, Kate & Boord, Jesse
    - Reef Futures poster (December 2024) Managing Invasive Algae Using Native Urchins as a Biocontrol
  - Monaghan, Elizabeth
    - Aquatic Invasive Species (January 2024) - HISC Legislative Briefing
    - *Unomia stolonifera* in Hawai‘i (February 2024) - USCRTF Pacific Preparedness Working Group
    - Hawai‘i Ballast Water and Biofouling Program (April 2024) - Pacific Ballast Water Group Meeting
    - Invasive Octocoral In Hawai‘i (May 2024) - Aquatic Nuisance Species Task Force Meeting
    - Kāne‘ohe Bay Regional Council Meeting (December 2024) - *Anemonia manjano* Response
  - Tom, Sarah & Gonzalez, Kate
    - Punahou (April 2024) Presentation on issues of invasive species and career paths in the Hawaiian Islands to an AP environmental course (~15 students)

- Lev Gerstle
  - Waikīkī Aquarium (October 2024) Presentation as a part of the Don't Let it Loose Campaign to inform the public about the risks of releasing illegal pets into the wild and how to prevent them from harming our ecosystems
- Pilina Kanaloa Ocean Day Booth at the Capitol (March 2024)
  - Communicated Hawai'i invasive species concerns to legislators, students, and other members of the general public (~150 people)
- Ocean Day Booth at Waikīkī Aquarium (April 2024)
  - Tabled at Waikīkī Aquarium to talk about invasive species as part of the Ocean Day outreach event (~200 people)
- Ho'ōla Hani'o Coral Restoration Event, Electric Beach (May 2024)
- Hawai'i Invasive Species Awareness Month Panel (May 2024)
  - Provided career advice and invasive species education to young professionals looking to enter the field (~15 people)
- Kupu Environmental Fair (June 2024) (~100 people)
  - Tabled on the work of the AIS and BWBF Teams to Kupu summer program participants
- Mālama Pūpūkea-Waimea World Ocean Day, Waimea Falls (June 2024)
  - Performed outreach to local families, students, and visitors on the importance of best practices for protecting from invasive species (~60 people)
- Created and distributed pamphlets to inform on best practices for identifying and preventing the spread of coral diseases
- Don't Let It Loose Campaign
  - (August 2024) Created and distributed outreach material to all pet stores on the island as part of an effort to spread the word on aquarium releases and invasive species introductions
  - (October 2024) Participated in Don't Let it Loose week with partner organizations. Tabled and gave talks at the Waikiki Aquarium to educate the public on the dangers of aquarium releases (~200 people)
  - Updated website to reflect the priority of Don't Let It Loose outreach for AIS Team



World Ocean Day outreach event at Waikīkī Aquarium



AIS staff running a booth at Malama Pūpūkea World Ocean Day

- Kanoelani STEAM Fest (September 2024)
  - Tabled with Protected Species Team at STEAM fest. Communicated concerns about invasive species to students of various ages (~100 people)
- Hawai‘i Technology Academy Presentation (November 2024)
  - Presented and gave a tour to students on the issues of invasive species in the Hawaiian Islands (~10 students)
- 2nd Annual ‘Āina Momona (November 2024)
  - Participated in the annual ‘Āina Momon event in Lā‘ie. Helped with hukilau opening event and tabled to communicate invasive species issues for high school-aged students

### **Training Sessions, Working Groups, and Conferences**

- Fish Identification and Survey Technique Workshop
- O‘ahu Post-Storm Response Workshop
- Oceanic Institute Limu Workshop
- DAR O‘ahu Coral ID Workshop
- USACE Honolulu Harbor Resiliency Workshop
- Smith Lab Avrainvillea Workshop
- MEGA Lab at UH Hilo SfM Workshop
- Hawai‘i Marine Animal Response Training Session
- Papahānaumokuākea Marine National Monument Resource Protection Working Group
- Unomia Learning Exchange Working Group
- Don’t Let It Loose Amnesty Week Working Group
- *Anemonia manjano* Working Group
- Hawai‘i Invasive Species Council (HISC) Resources Working Group
- USCG Vessel Incidental Discharge Act (VIDA) Working Group
- VIDA-ANS Risk Response Framework Workgroup
- Hawai‘i Invasive Species Awareness Month (HISAM) Working Group
- Biofouling International Regulators’ Discussion (BIRD)
- USCRTF Coral Disease & Disturbance, Transmission Team, and Pacific Preparedness Working Group
- Western Regional Panel Coastal Committee
- Coordinating Group on Alien Pest Species (CGAPS) Quarterly Public Meeting & Steering Committee
- Hawai‘i Invasive Species Council (HISC) Quarterly Public Meeting
- Alien Aquatic Organism Task Force (AAOTF) Meeting
- 2024 International Conference on Aquatic Invasive Species (ICAIS)
- 2024 Chondria Conference (ChonCon)
- 2024 Hawai‘i Conservation Conference (HCC)

- 2024 Pacific Ballast Water Group (PBWG) Meeting
- 2024 Reef Futures Conference
- 2024 Invasive Species Advisory Committee (ISAC) Meeting
- 2024 Aquatic Nuisance Species Task Force (ANSTF) Meeting