

**Papahānaumokuākea Marine National Monument**  
**Agency Report to the Reserve Council**  
August 20 – October 22, 2020

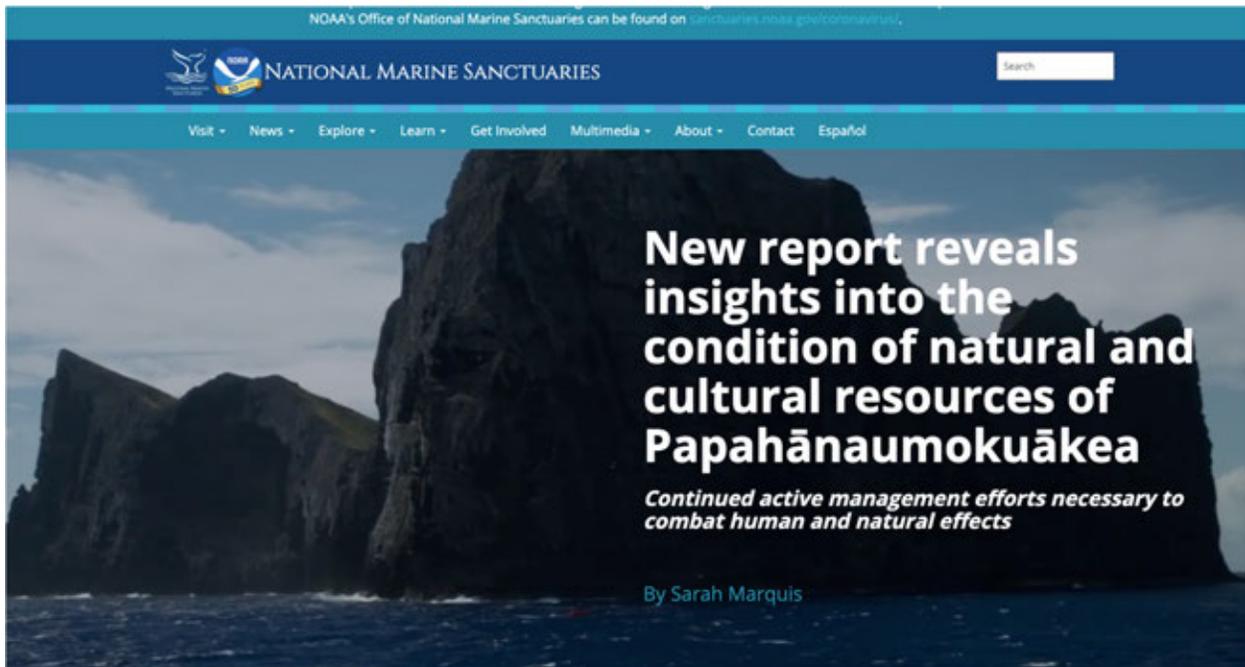
**Agency:** NOAA/NOS/ONMS/PMNM  
**Presented by:** Athline Clark, Superintendent  
**Date:** October 22, 2020

**Agency Accomplishments & Recent Activities**

*Agency Coordination*

**State of Papahānaumokuākea Marine National Monument Report Released**

NOAA published a peer-reviewed report on the State of Papahānaumokuākea Marine National Monument (PMNM), jointly produced by the Co-Trustees of the monument, NOAA, U.S. Fish and Wildlife Service, Hawaii Department of Land and Natural Resources, and the Office of Hawaiian Affairs. The report provides a snapshot of status and trends of the physical environment, living resources, and historical and cultural archaeological resources, valuable information that will support future management planning, the identification of Monument research priorities, and decision making on permitted activities. This report will also prove useful to scientists and others studying phenomena such as regional or archipelagic climate change effects. It also provides a framework that can inform discussions among managers, researchers, communities, and stakeholders about preserving the integrity of Papahānaumokuākea. Contact: [Athline.Clark@noaa.gov](mailto:Athline.Clark@noaa.gov) or [Jonathan.Martinez@noaa.gov](mailto:Jonathan.Martinez@noaa.gov)



[Access the full report here](#) or read the [webstory with this link](#).

### **PMNM, USFWS and NASA Collaborate to Track Coral-Killing Algal Outbreak**

On August 24<sup>th</sup>, 2020, PMNM Field Team member, Keolohilani H. Lopes Jr. was selected for as an intern for the highly competitive NASA Digital Earth Virtual Environment and Learning Outreach Project ([DEVELOP](#)). This year's virtual internship from NASA's Ames Research Center in Silicon Valley will develop a digital tool that will allow managers to locate areas where the coral-smothering algae, *Chondria tumulosa*, could be detected via remote sensing. Mr. Lopes and the NASA team will be utilizing Google Earth Engine, NASA satellite products, and field knowledge to accurately identify and determine the full spatial extent of this algae. The outbreak was first discovered at Pearl and Hermes Atoll last summer. A NOAA, NASA, and USFWS working group will embark on this 10-week collaborative effort from September 14 to November 2020. For more information on this project or the open access paper on the taxonomic determination of *C. tumulosa*, contact [Keolohilani.lopes@noaa.gov](mailto:Keolohilani.lopes@noaa.gov).

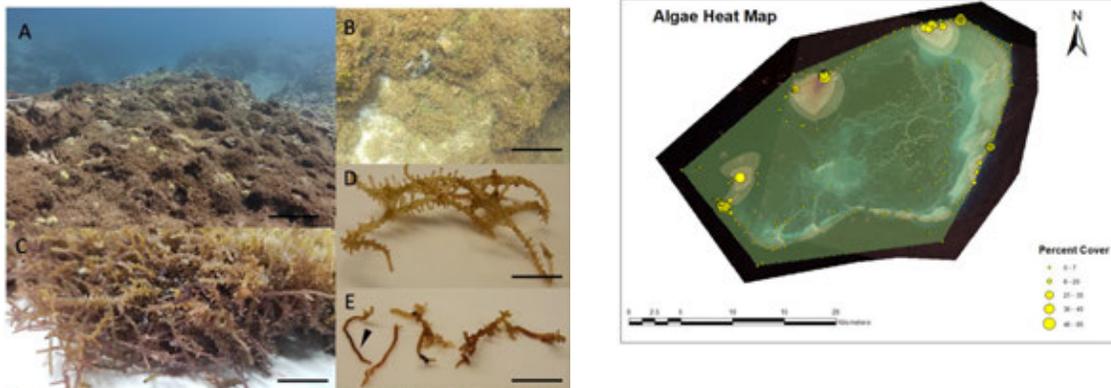


Photo: (Left) *Chondria tumulosa* (Sherwood et al, 2020). (Right) Map of Manawai (Pearl and Hermes Atoll) and the surveyed areas. The percent cover is represented by graduated circles and an underlying heat map (Map: K.H.Lopes Jr.).

### **PMNM Co-Hosts Session 3 of the Resource Protection Crosscut Virtual Workshop**

On September 17th, PMNM's Deputy Superintendent co-hosted the 3rd and final session of the Resource Protection and Permitting Crosscut Virtual Workshop. The session brought together over thirty ONMS participants from across the country to discuss communication issues and advancements in Permit, Resource Protection, and NMSA 304(d) consultation portfolios. For more information, contact [Eric.Roberts@noaa.gov](mailto:Eric.Roberts@noaa.gov).

### **PMNM Hosts "State of the Monument" Session at Hawai'i Conservation Conference**

PMNM staff organized and moderated a session entitled "The Status of Resources in the Papahānaumokuākea Marine National Monument" at the 27th Hawai'i Conservation Conference (HCC). Held virtually this year, HCC is a large annual meeting attended by a diverse group of scientists, policymakers, educators, students, and community members. The PMNM session, attended by approximately 125 people, focused on preliminary assessments of the status and

trends of the physical environment, Hawaiian monk seals, green sea turtles, biodiversity, terrestrial and marine invasive species, and Native Hawaiian resources. Four of the presentations were by PMNM scientists (abstracts available at <https://www.hawaiiconservation.org/wp-content/uploads/8.28.2020-Abstract-Book-by-ID.pdf>). The session featured speakers from NOAA and the State of Hawaii. These assessments and many more have been written up in the State of the Monument Report. For more information, contact [jonathan.martinez@noaa.gov](mailto:jonathan.martinez@noaa.gov)



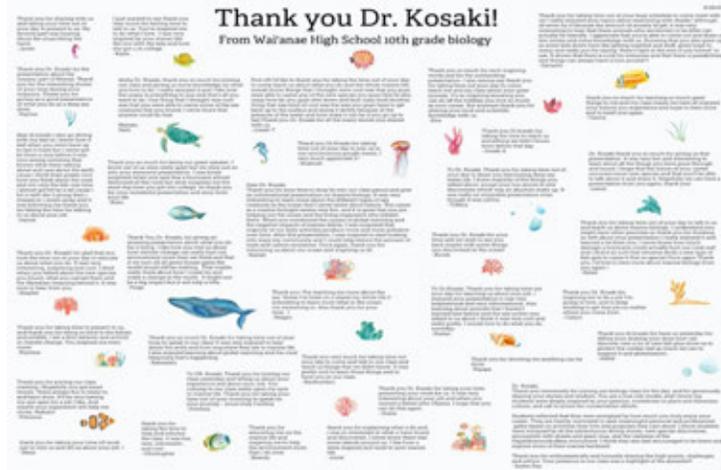
## *Education*

### **MDC Supporting Teaching with University of Hawai'i C-MORE Science Kits**

MDC has been a long-time C-MORE Science Kit host, partnering with the UH School of Ocean and Earth Science and Technology (SOEST) to provide interactive kits on marine debris, ocean currents, plankton and more. MDC has been working with UH SOEST staff to create sanitation protocols for the kits and are pleased to be making these kits available to local teachers who are already using kit materials to present lessons to their students online. For more information, contact [Justin.Umholtz@noaa.gov](mailto:Justin.Umholtz@noaa.gov).

### **PMNM Scientist Gives Online Presentations to Multiple 10<sup>th</sup> Grade Science Classes**

On September 28, PMNM research coordinator Randy Kosaki gave online interactive presentations and Q&A sessions to four consecutive classes of tenth grade science students (approx. 85 students total) from Wai'anae High School on O'ahu's west side. Kosaki's presentation focused on recent discoveries resulting from exploration of deep coral reefs in PMNM, and global-scale threats to coral reef ecosystems worldwide. The students are in the midst of a two-month lesson on marine science. For more information, contact [randall.kosaki@noaa.gov](mailto:randall.kosaki@noaa.gov).



*Students from Wai`anae High School share their thanks with Dr. Kosaki*

## **Mokupāpapa Discovery Center (MDC) Report for August 20 to October 22, 2020**

### **Webinar on Robotics Programs at Mokupāpapa Discovery Center**

Mokupāpapa Discovery Center (MDC) held its August Third Thursday By the Bay Webinar series with a talk about robotics programs on Hawai‘i Island and the partnership between Hawai‘i Science and Technology Museum (HSTM) and MDC. Eighty webinar attendees listened to HSTM Executive Director Christian Wong as he spoke about the robotics programs run by the museum for students, the new Kenyan K. Beals Community Robotics Center co-located at MDC, and an upcoming launch of a micro satellite (CubeSat) developed by students in partnership with Hawai‘i Space Flight Laboratory, UH Institute of Astronomy, and HSTM to monitor the thermosphere. The webinar was held in partnership with the ONMS Webinar Series and will be archived on the ONMS site. For more information contact: Andy Collins, [andy.collins@noaa.gov](mailto:andy.collins@noaa.gov).



*Photo: HSTM Executive Director Christian Wong helps students prepare for an ROV competition (pre-COVID-19) held in partnership with Mokupāpapa Discovery Center and the MATE Program. Credit: Andy Collins/NOAA Office of National Marine Sanctuaries*

### **Mele No Papahānaumokuākea exhibit gets refurbished**

MDC celebrates the refurbishment of the existing Mele No Papahānaumokuākea exhibit, drawing upon cultural, artistic, and construction guidance and expertise from multiple PMNM staff. The improved exhibit includes refreshed signs using existing content in 'Ōlelo Hawai'i (Hawaiian) and English and a custom-crafted panel inviting visitors to choose from three Hawaiian experts performing the song written in honor of the monument. For more information, contact [Justin.Umholtz@noaa.gov](mailto:Justin.Umholtz@noaa.gov).



*The panel offers the English translation as well as an interpretation of the mele. Each green button is connected to a different person performing the song, including one of the composers. (Credits: Clayton Watkins/NOAA)*

### **MDC Volunteer of the Year Receives Socially-Distanced Accolades**

Kyla Marie Turner met with MDC Co-Manager and Volunteer Coordinator Virginia Branco to receive her Volunteer Service Award for being selected as our PMNM Volunteer of the Year. Due to Covid-19 precautions, the ceremony was outside the facility, but Kyla expressed that she was very honored and touched to receive such a lovely award. Kyla has had to change her original plans of attending school on the mainland and is now focusing on attending school at the University of Hawai'i at Hilo due to the pandemic. She is majoring in English/Anthropology with a minor in Hawaiian Studies. She will continue to volunteer for MDC and looks forward to when we re-open to host an art exhibition. Like many of our volunteers, they are sad to see us remained closed and are patiently waiting our return. For more information, contact [Justin.Umholtz@noaa.gov](mailto:Justin.Umholtz@noaa.gov).



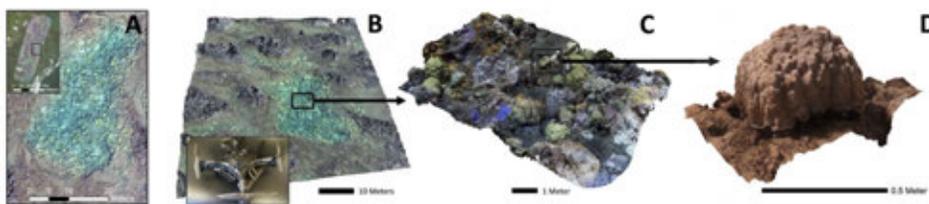
*Kyla shows off her Volunteer of the Year Award outside the MDC facility. (Credit: Virginia Branco/NOAA)*

### **MDC Staff Participate in National Park Service Interprecon Conference**

NOAA staff were invited to participate in the NPS three-day interpretive conference September 15-17. The conference offered an array of virtual halls with timely topics on creating effective and inclusive interpretive products and experiences and improving site interpretation to unearth and honor untold stories. For more information, contact [Justin.Umholtz@noaa.gov](mailto:Justin.Umholtz@noaa.gov).

### **3-D Modeling Coral Reefs: How Data Science Helps us Better Understand Coral Reef Ecosystems**

As part of the [National Marine Sanctuaries Webinar Series](#), and Mokuapāpapa's September Third Thursday by the Bay Lecture Series, 525 formal and informal educators, scientists, students, and families registered for the *3-D Modeling Coral Reefs: How Data Science Helps us Better Understand Coral Reef Ecosystems* by Dr. John Burns, Assistant Professor at the University of Hawai'i Hilo. 215 people from across the world attended the live presentation as Dr. Burns explained how photogrammetry and 3D modeling transform our ability to monitor and manage the coral reefs in PMNM. If you are interested in being a guest presenter or would like more information about this webinar series, please contact [Andy.Collins@noaa.gov](mailto:Andy.Collins@noaa.gov).



*An example of coral 3D rendering and how it can support structural analysis. Photo: John Burns*

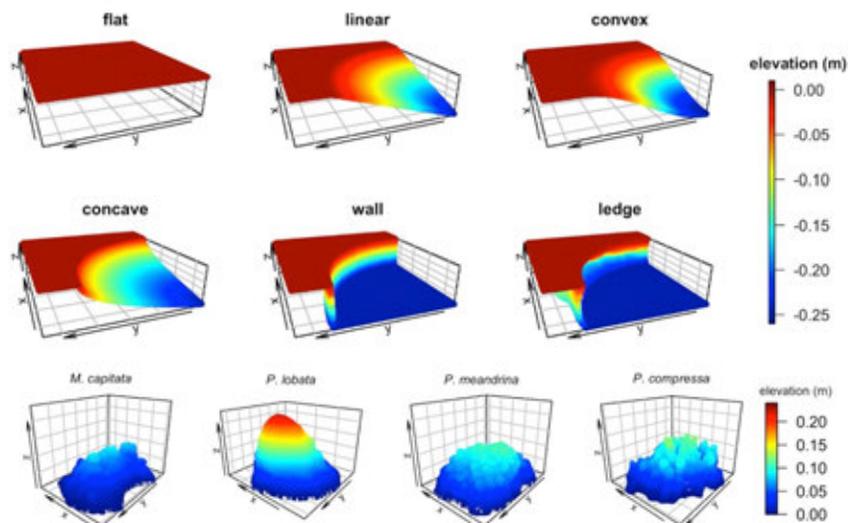
## PMNM Participates in 22nd Annual American Indian Tourism Conference

MDC Education and Native Hawaiian Outreach Associate Malia Evans was one of 700 attendees at the 22<sup>nd</sup> annual American Indian Tourism Conference held virtually from September 14-18, 2020. Registration fees for all attendees were waived through NATIVE Act [Public Law 114-221](#) funding. The conference theme of “One Country Many Nations” focused on Native led cultural and heritage tourism efforts toward economic recovery through 30 educational presentations, breakout sessions, and opportunities to network through community boards, happy hours and artist exhibitions. For more information, contact [Malia.Evans@noaa.gov](mailto:Malia.Evans@noaa.gov)

## Research & Field Operations

### PMNM Scientists Publish Paper on 3D Photogrammetry on Coral Reefs

On August 19, JIMAR PMNM Ecological Research Statistician Atsuko Fukunaga published a peer-reviewed article “Metrics of Coral Reef Structural Complexity Extracted from 3D Mesh Models and Digital Elevation Models” in the journal *Remote Sensing*. PMNM has been using this photogrammetry technique to reconstruct coral reef habitats of the Monument. Using simulated 3D models of coral morphologies and surface structures, the article investigates how certain coral morphologies and surface structures (e.g. holes and ledges) individually and collectively affect the structural complexity of coral reef habitats. The article includes R/Python scripts to extract a variety of habitat complexity metrics from 3D reconstruction of coral reefs that can be used by anyone utilizing 3D photogrammetry techniques. The article, which is co-authored by John Burns (University of Hawai‘i at Hilo), can be accessed online at <https://www.mdpi.com/2072-4292/12/17/2676>. For more information, contact [atsuko.fukunaga@noaa.gov](mailto:atsuko.fukunaga@noaa.gov).



*3D models of surface structures and coral morphologies used in the article*

### R/ V *Hihimanu* Yard Work and Dry Dock

On September 9<sup>th</sup>, 2020, two members of the PMNM field team, Brian Hauk and Keolohilani H. Lopes Jr., delivered PMNM’s 11-meter boat, *Hihimanu*, to Keehi Marine Center for dry dock repairs. Scheduled work includes a fresh coat of anti-fouling bottom paint, surveying the hull for aluminum wastage, cleaning and inspection of the fuel tank and sealing failed sections of the

deck surface. This yard work will increase the lifespan of the vessel and help ensure PMNM vessels meet NOAA's small boat regulations. Strict NOAA COVID-19 protocols were followed by PMNM staff and contractors at all times. For more information contact [Brian.Hauk@noaa.gov](mailto:Brian.Hauk@noaa.gov).



*Photo: (Left) Hihimanu being hoisted out of the water (Photo: Brian Hauk/ NOAA). (Right) Hihimanu on stands being prepared for hull work. (Photo: Randy Yanos/ Regal Service Company).*

### **PMNM Participates in Workshop to Identify Pacific Exploration Priorities**

On September 21 and 22, PMNM research coordinator Randy Kosaki participated in the discussion breakouts and plenary wrap-up sessions of the Consortium for Ocean Leadership's *Workshop to Identify National Ocean Exploration Priorities in the Pacific*. The report resulting from the workshop will identify priority information gaps and will directly inform NOAA as it develops a strategy to map and characterize the US EEZ as required by the November 2019 presidential memorandum on mapping and exploration of US waters. Other ONMS participants included Steve Gittings, Val Brown, and Jan Roletto. For more information, contact [randall.kosaki@noaa.gov](mailto:randall.kosaki@noaa.gov).

### **PMNM Charter Vessel Supports SANCTsound**

On September 25<sup>th</sup>, 2020, PMNM Field Team member Jason Leonard set sail aboard the vessel Searcher on an eight-day collaborative expedition into the monument. The goals for this mission, which was coordinated with the Hawaii Island Humpback Whale National Marine Sanctuary, were to retrieve and deploy moorings with passive acoustic equipment. This was an essential mission, as the batteries which activate the acoustic releases on these devices were soon to expire leading to the loss of valuable data and equipment. The mission was a success resulting in the successful retrieval of 4 of 5 moorings and deployment of two. The data that the equipment contains are highly valuable and will allow ONMS researchers to identify the distribution of humpback whale occurrence in the monument, may lead to improved habitat maps as well as information to support permit reviews and environmental compliance consultations. The research team led by Dr. Marc Lammers from HIHW will analyze the data over the coming months. For more information contact [Jason.Leonard@noaa.gov](mailto:Jason.Leonard@noaa.gov) or [Jonathan.Martinez@noaa.gov](mailto:Jonathan.Martinez@noaa.gov)



*Photo: (Left) PMNM staff Jason Leonard aboard the R/V Searcher departs from the Kewalo Boat Harbor in Honolulu, HI with full safety and health BMPs (Photo: J. Leonard). (Right.). Jason Leonard with retrieved scientific equipment (Photo: NOAA).*



*Photo: (Left) R/V Searcher preparing to fuel after the completion of the hull inspection while PMNM staff Keo Lopes examines the waterline for non-indigenous species (Photo: B. Hawk). (Right.). The hundreds of pounds of gear being prepared for deployment (Photo: NOAA).*

### **PMNM Staff Joins Multi-Agency Aquatic Biosecurity Working Group**

PMNM's JIMAR-Resource Protection Manager, Brian Hawk has been working with the State of Hawaii's Department of Land and Natural Resources (DLNR)/Division of Aquatic Resources (DAR), Hawai'i Invasive Species Council (HISC) and the Coordinating Group for Alien Pest Species (CGAPS) over the last year in the development of their [HISC-CGAPS-2025-Joint-Strategy Plan](#). On September 30, 2020 a group of ~30 members from State, University and USFWS agencies met with DAR and CGAPS staff virtually for the first Biosecurity working group meeting to discuss the new plan and how to implement the key actions which resulted from the prior meetings (see page 15). These 9 Key Actions fall directly in line with PMNM's Resource Protection objectives and staff hope to utilize the outcomes to restructure PMNM's Management plan with regards to aquatic alien species management. For more information on PMNM's alien species vessel inspection program, contact [Brian.Hawk@noaa.gov](mailto:Brian.Hawk@noaa.gov).



*Photo: (Top) Stakeholders gather (pre-COVID19) to provide input on the draft HISC & CGAPS 2025 Strategy (PC: Randy Bartlett). (Bottom) CGAPS network working with vessel operators, UH, HDOT, USCG, DLNR DAR, NOAA, and other agencies to address ballast water and biofouling (PC: CGAPS).*