

Papahānaumokuākea Marine National Monument
Agency Report to the Reserve Council
March 24, 2021 – June 29, 2021

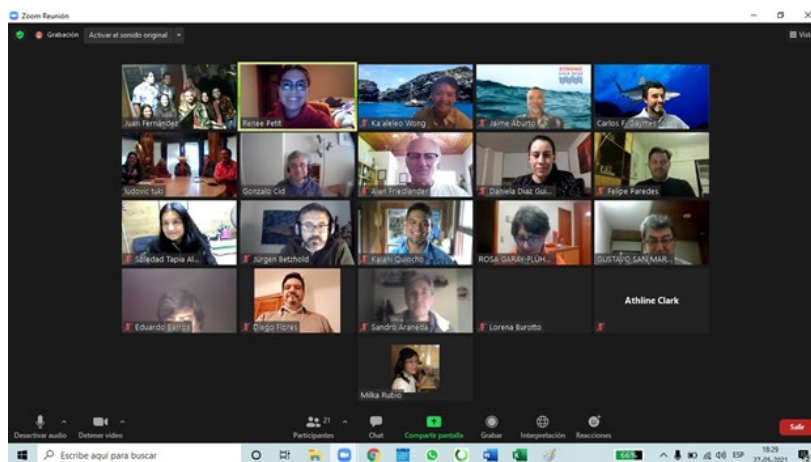
Agency: NOAA/NOS/ONMS/PMNM
Presented by: Athline Clark, Superintendent
Date: June 30, 2021

Agency Accomplishments & Recent Activities

Agency Coordination

PMNM and MPA Center participate in Chile short course for Rapa Nui & Juan Fernandez Islands

PMNM/ONMS and National MPA Center staff participated in a two-day short course to support the communities of Rapa Nui and the Juan Fernandez Islands in developing their management plans for the Rapa Nui Marine Park and the Juan Fernández Islands Marine Park off the coast of Chile. Other participants included the National Geographic Society’s Pristine Seas, Conservation International, NOAA Fisheries Pacific Islands Region Monuments Program, and the Office of Hawaiian Affairs. Topics included conservation of Pacific oceanic islands marine ecosystems, large-scale MPA management, co-management governance and coordination, linking management with traditional and customary use, community engagement and involvement, and the PMNM Mai Ka Pō Mai Native Hawaiian Guidance Document. Contact: Gonzalo.Cid@noaa.gov and Kalani.Quiocho@noaa.gov



Virtual group photo of participants located in Hawai‘i, Washington D.C., Aotearoa (New Zealand), Rapa Nui, Juan Fernandez Islands, and Chile. (Photo: Carlos Gaymer)

PMNM and HQ Policy & Planning Team Hosts NEPA-HEPA Workshop

On May 12, staff from ONMS Headquarters and PMNM hosted a virtual workshop on NEPA-HEPA for the Monument Management Board as part of initial preparations for an integrated management plan-sanctuary designation effort. Presentations were interspersed with discussion sessions and included an overview of the management planning and sanctuary designation processes and summary reports on joint NEPA-HEPA requirements and other technical aspects by ONMS staff Athline Clark (PMNM), Jon Martinez (PMNM), Sophie Godfrey-McKee (HQ), and Alyssa Miller (PMNM). The workshop was the first step in preparing PMNM managers for federal and state environmental review requirements that will come up during the combined management planning and sanctuary designation

processes. The half-day workshop was attended by 27 participants representing multiple agencies including the U.S. Fish and Wildlife Service, Office of Hawaiian Affairs, NOAA-NMFS, NOAA-ONMS, Hawai'i Department of Land and Natural Resources, Hawai'i Office of Environmental Quality Control and Hawai'i Office of Coastal Zone Management. For more information contact: Athline.Clark@noaa.gov.



Impromptu screen shot of participants at the virtual workshop (Photo: Eric Roberts/PMNM)

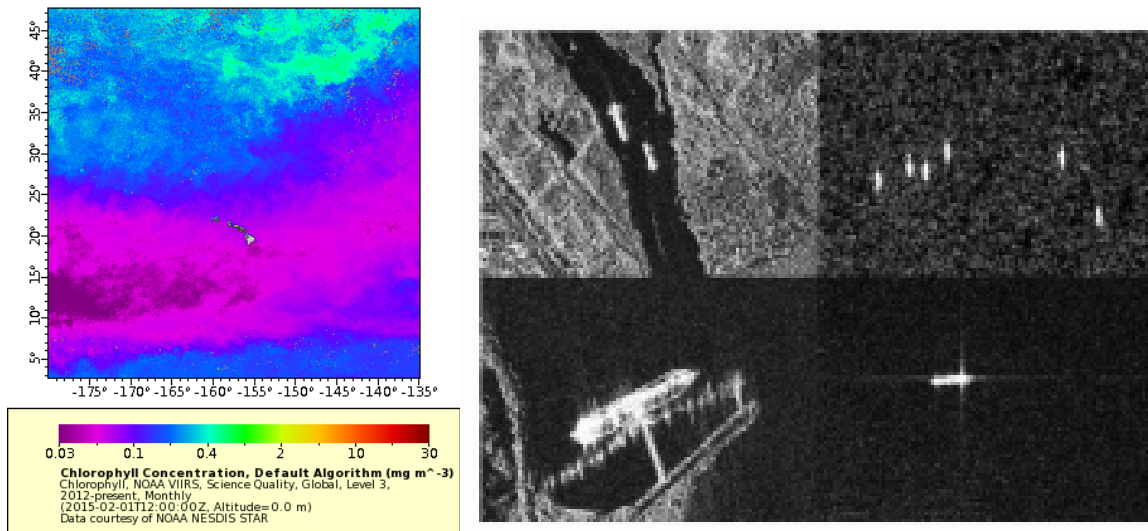
PMNM Holds Semi-Annual Law Enforcement Coordination Team Meeting

On May 5, PMNM's Law Enforcement Coordination Team held their first semi-annual meeting of 2021 that included agency representatives from NOAA's Office of Law Enforcement and General Counsel for Enforcement and Litigation, FWS's Office of Law Enforcement and Refuge Law Enforcement, Hawaii's Division of Conservation and Resource Enforcement, and the U.S. Coast Guard. During the meeting, PMNM staff provided updates on permitted activity, vessel transit notifications, as well as potential impacts PMNM field camps are documenting from a variety of container spills in the North Pacific. Agency representatives also provided updates on current law enforcement cases and surveillance efforts in PMNM and how they can continue to coordinate activities moving forward. The next meeting is scheduled for October 6, 2021. For more information contact: Eric.Roberts@noaa.gov.

An upcoming surveillance project utilizing albatross to detect illegal fishing activity (Photo: Phillip Howard/PMNM)

PMNM staff participate in NOAA CoastWatch Sanctuaries Satellite Data Course

PMNM scientists and educators joined NOAA CoastWatch staff for a week-long satellite data training course focused on ONMS sites. Through a series of speakers, training modules, and individual projects, participants gained a better understanding of available data and data products. Participants were also able to identify and discuss data priorities with course organizers and presenters. PMNM staff learned how to obtain site-specific time series data for sea surface temperature and Chlorophyll-a and plans to incorporate them in future analyses of coral community data at permanent monitoring sites throughout the Monument. PMNM staff also learned how satellite Synthetic Aperture Radar (SAR) can be utilized to verify vessel locations by comparing data between AIS, VMS and/or vessel notifications in PMNM. Additionally, staff were able to identify several environmental datasets which could explain drivers for different phenomena observed in the Monument.



Left: Satellite derived chlorophyll in the North Pacific indicating the Transition Zone Chlorophyll Front immersing the northern latitude island waters with nutrients and potentially algal propagules from temperate locations. Right: Synthetic aperture radar (SAR) images that can be used to validate vessel positions (Photo: Jonathan Sweeney/NOAA)

Constituency Building and Outreach

NOAA Pacific Region Hosts World Ocean Day Event

On June 13, Papahānaumokuākea MNM, NOAA Pacific Region, Conservation International, and local partners hosted a virtual 5th Annual World Ocean Day Celebration. The two-hour event aired on ‘Ōiwi TV’s Facebook channel and had 5,287 views with an estimated reach of 21,942. Local musicians Kapena and family, Drew Henmi, Josh Tatofi and Ron Artist II performed material related to ocean conservation. With assistance from conservation partner KUPU Hawai‘i, video messages from youth around the Pacific were shared to show their love for the ocean, and wishing Papahānaumokuākea a happy 15yr Anniversary. The theme of this year’s celebration was “I ola nō nā hanauna i ka welo” - the generations thrive because of their common heritage. In addition to the great entertainment, NOAA scientists presented on the changing methods of scientific research – from basic SCUBA diving 25 years ago to Artificial Intelligence fish counting robots today. NOAA partner Conservation International, with Ko Olina Resorts, shared about their work to promote eating of the invasive reef fish ta‘ape and a local chef prepared one of his favorite recipes. Finally, PMNM Research Coordinator Randy Kosaki and his sister, local celebrity spearfisher Kimi Werner, shared their efforts to inspire the next generation to care for our ocean. For more information, please contact Athline.Clark@noaa.gov



NOAA Scientists Ben Richards, Frank Parrish, and the youngest person to descend to the bottom of the Marianas Trench, Micronesian Scientist Nicole Yamase, discuss how research has changed over the years.

NOAA Outreach and Education in the Pacific Islands Region Featured on ThinkTech Hawai‘i for World Ocean Day

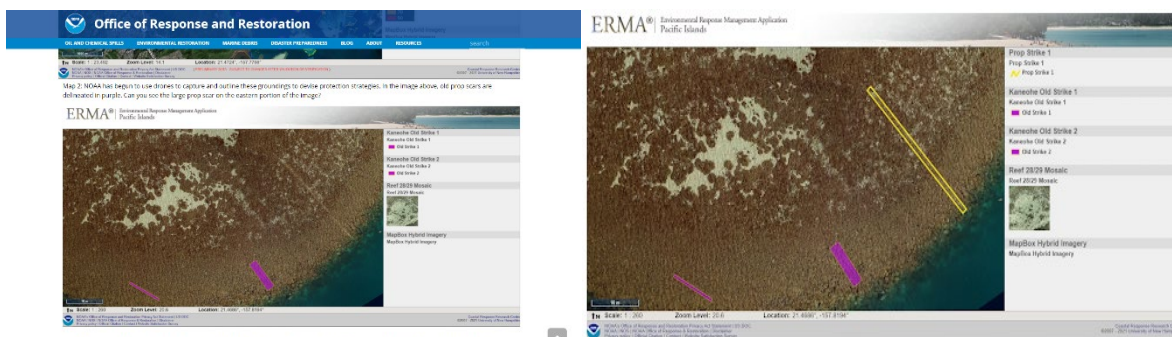
On World Ocean Day, June 8, the online channel ThinkTech Hawai‘i, <https://thinktechhawaii.com>, and its show Cooper UNion, featured NOAA’s Pacific Island Region Education Specialist Leon Geschwind, and Papahānaumokuākea Education Coordinator Andy Collins. During the show host Joshua Cooper discussed some of the impacts to the ocean and what NOAA is doing to address these issues, as well as highlighting the upcoming World Ocean Day event NOAA and partners are hosting this Sunday, June 13th (<https://www.papahanaumokuakea.gov/wod/2021/>), an upcoming climate teacher workshop, and Papahānaumokuākea MNM’s 15th Anniversary on June 15th. The show was recorded and will be live on the website and their social media pages soon. For more information please contact Andy.Collins@noaa.gov.



Screen shot from Think Tech Hawaii presentation.

PMNM CoLab Maps Featured in OR&R's Websites Map of the Month

Recently, PMNM CoLab (Collaborative Laboratories) UAS map products were used to create the OR&R websites', "Map of the Month" ([OR&R Website](#)). OR&R's ERMA (Environmental Response and Management Application) will be the repository for the damage assessment data created by PMNM CoLab. The drone imagery was collected by Matthew Parry and Robert O'Conner from PIR DARRP and subsequently stitched, orthorectified and analysed by PMNM's Keolohilani H. Lopes Jr. This UAS image analysis was coordinated by the three agencies involved to test the end-to-end processing, from collection to the public dissemination of data and information. This important facet of the collaboration was successful and the PMNM CoLab looks forward to continuing to advance UAS technologies to meet the needs of NOS/ONMS. For more information contact Keolohilani.Lopes@noaa.gov.



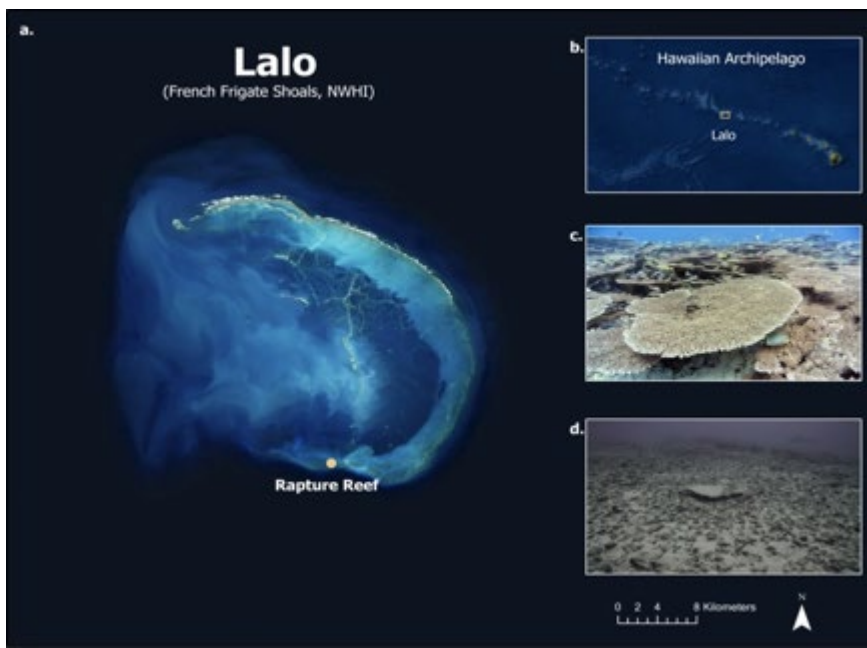
Left: Screenshot of OR&R website. Right: ERMA data hosting system which will contain all future damage assessments generated by PMNM CoLab.

Research & Field Operations

Scientists Publish Description of Damage by Hurricane Walaka to Coral Reefs at Lalo

On June 8, the journal *Scientific Reports* published a paper by PMNM and University of Hawai'i scientists on the impacts of Hurricane Walaka to Rapture Reef at Lalo (French Frigate Shoals). Walaka pounded the atoll with estimated 15 m waves and 205 km/h winds on Oct. 3, 2018. Rapture Reef at Lalo was formerly known for very high cover by *Acropora* table corals, and extraordinarily high fish biomass and diversity. Post-storm coral cover was reduced to zero. 3D photogrammetry was used to quantify changes to the structural complexity of the reef. The paper is based on one day of surveys that were completed in 2019. A lack of ship time has precluded any further efforts to document damage at other areas of the atoll. Kailey Pascoe, first author on the paper, was a PMNM RAMP cruise student intern who is now in a Ph.D. program under Dr. Greg Asner of Arizona State University. The open-access paper is available at <https://doi.org/10.1038/s41598-021-91509-4>. For more information, contact Randall.Kosaki@noaa.gov.

Pascoe KH, Fukunaga A, Kosaki RK, Burns JHR. 2021. 3D assessment of a coral reef at Lalo Atoll reveals varying responses of habitat metrics following a catastrophic hurricane. Scientific Reports (2021) 11:12050.



(a, b) Satellite imagery and inset showing location of Rapture Reef, Lalo (French Frigate Shoals) in the Hawaiian Archipelago. Rapture Reef (c) before (Sept. 2017) and (d) after Hurricane Walaka (July 2019). (Credit: Kailey Pascoe, Univ. of Hawai'i at Hilo)

PMNM Kicks Off Annual Field Season Preparations

On May 3, PMNM officially began the field season with a hull inspection of the M/V Searcher. LTJG Luke Evancoe and Jason Leonard maintained topside support as Brian Hawk and Keo Lopes focused on the inspection. The PMNM field team also began preparing diving systems for the upcoming field season, following a long break from diving due to COVID-19. All of the SCUBA tanks were professionally inspected, prior to being filled by field team members Jason Leonard and Keo Lopes. For more information contact: Keolohilani.Lopes@noaa.gov.



Left: Hull Inspection Image (Hawk/PMNM). Center: Preparing First Aid Kits (Leonard/PMNM). Right: All tanks filled and ready to dive (Leonard/PMNM).

Scientists Describe New Species of Mesophotic Red Algae from PMNM

On April 10, research scientists from the University of Hawai'i, PMNM, and other institutions named another new species of red algae from the NWHI. Discovered on a PMNM research cruise in 2019, *Meredithia hawaiiensis*, was first collected on rebreather dives by PMNM scientists Brian Hawk and Randy Kosaki. Depths ranged between 180 ft. and 280 ft. Other species of this genus are known from waters around southwestern Australia and elsewhere, typically at latitudes of 29° or higher. Thus, the genus appears to have sub-tropical or temperate affinities. This is consistent with the discovery of *M. hawaiiensis* at cooler, high latitude reefs in PMNM, and at cooler mesophotic depths. Genetic divergence from other congeners is in the 8%-11% range, which denotes separation from its nearest relatives by approximately 3 million years. This is roughly contemporaneous with the last great global

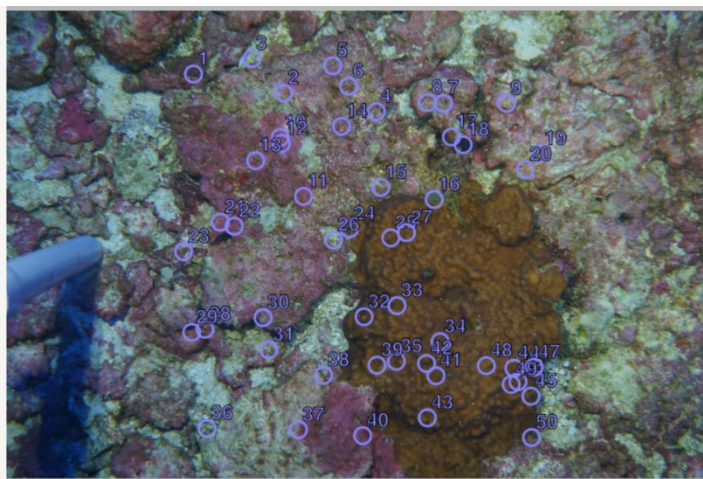
cooling event about 2.75 million years ago. Cooler sea surface temperatures at that time would have facilitated dispersal of propagules to the NWHI from similar high latitude reefs in the Southern Hemisphere, followed by isolation and speciation due to the warm tropical barrier. The paper describing this new species is available online at <https://doi.org/10.1080/09670262.2021.1891462>. For more information, contact randall.kosaki@noaa.gov.



Specimens of M. hawaiiensis, collected at Kapou (Lisianski Is.) at 180 ft. Scale bar = 2.5 cm.

PMNM Student Intern Defends MS Thesis Based on PMNM Mesophotic Benthic Data

On April 13, former PMNM summer intern Laura Knight successfully defended her master's thesis, "Quantitative Analysis of Mesophotic Zone Deep Reef Benthos in the Northwestern Hawaiian Islands." Knight is an alumna of the Univ. of Hawai'i at Hilo's Marine Science Department, including the for-credit field course, Quantitative Underwater Ecological Survey Techniques (QUEST). Based on her outstanding performance in QUEST, she was selected as a summer intern to sail on one of PMNM's Reef Assessment and Monitoring Program (RAMP) cruises to the NWHI. Her MS thesis analyzed benthic photoquadrat images from deep coral reefs, collected by PMNM's rebreather divers. Under the MOA between the ONMS PIR and UH Hilo, PMNM research coordinator Randy Kosaki served as one of her MS thesis committee advisors. For more information, contact randall.kosaki@noaa.gov.

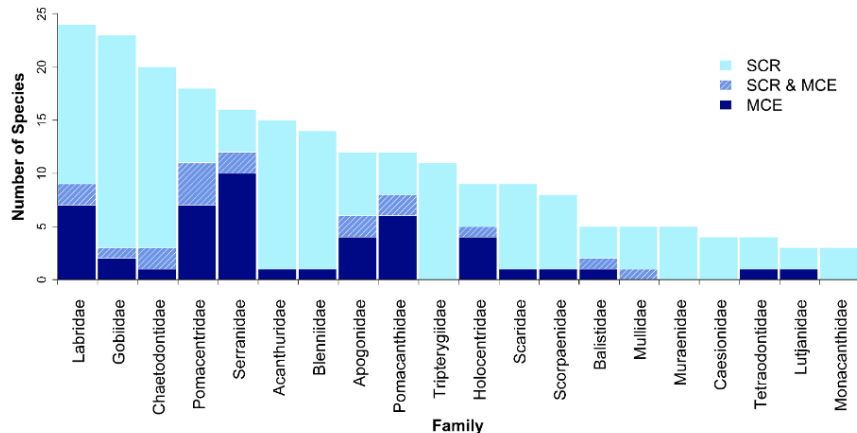


Example of a photoquadrat image of the benthos at Hōlanikū (Kure Atoll), transect 2016060501, depth 313 ft. Random points for annotation generated by the CoralNet software. (Photo: L. Knight)

Univ. of Hawai'i Student Defends Ph.D. on Deep Coral Reefs of American Sāmoa

On April 13, University of Hawai'i student Tony Montgomery successfully defended his Ph.D. dissertation on the mesophotic coral ecosystems (MCEs) of American Sāmoa. PMNM research coordinator Randy Kosaki served as one of Montgomery's Ph.D. dissertation committee advisors.

Montgomery's dissertation focused on a comparison between shallow and MCE coral communities, but also incorporated fish data and other observations collected by PMNM rebreather divers during dive expeditions to NMSAS over the past six years. Montgomery is a PI (along with PMNM's Kosaki and four other PIs from academic research institutions) on a \$2.4 million dollar NCCOS grant to more fully characterize the deep coral reefs of American Sāmoa using closed-circuit rebreather diving. This project has been stalled due to logistics associated with the global pandemic. For more information, contact randall.kosaki@noaa.gov.



The 20 most speciose families of coral reef fishes on shallow coral reefs (SCR) and mesophotic coral ecosystems (MCE) of American Sāmoa (Photo: Anthony Montgomery, Univ. of Hawai'i).

Scientists Give Hawaiian Name to a New Species of Mesophotic Algae from PMNM

On April 12, research scientists from the University of Hawai'i, PMNM, and other institutions published the description of a new species of red algae from the deep coral reefs of the Northwestern Hawaiian Islands. *Psaromenia laulamaula* was described from specimens collected on closed-circuit mixed gas rebreather dives at 280 ft. off Kapou (Lisianski Island). The species epithet, *laulamaula*, refers to the lau (leaf) of the lama tree (endemic Hawaiian ebony tree, *Diospyros sandwicensis*). 'Ula (red) refers to the red or magenta color of lama's young ovoid leaves. *P. laulamaula*'s blades are also oval and red in color. This species naming process, pairing the new alga with a terrestrial counterpart, builds on a naming precedent from the Kumulipo (the best known Hawaiian creation chant) and was done in consultation with Native Hawaiian practitioners. In the Kumulipo, species are created in sibling pairs, with terrestrial and marine counterparts sharing physical characteristics and similar or identical names. *P. laulamaula* is endemic to the NWHI. The open-access paper (by F. Cabrera, J. Huisman, H. Spalding, R. Kosaki, and A. Sherwood) describing this new species is available online at <https://www.tandfonline.com/doi/epub/10.1080/09670262.2021.1891462?needAccess=true>. For more information, contact Randall.Kosaki@noaa.gov



Left: Specimens of *P. laulamaula*, collected and pressed by Randy Kosaki. Right: Young leaves of the lama tree (endemic Hawaiian ebony), the terrestrial counterpart of *P. laulamaula* (Photo: K. and F. Starr).

First Flight: PMNM Field Team Completes UAS Training

On April 1, PMNM Field Team members Jason Leonard, Brian Hauk, and Keo Lopes successfully completed an Uncrewed Aerial Systems (UAS) training course on Oahu, Hawaii. This course introduced multiple platforms, safety features, flight software, and best operating practices for these aircraft. The PMNM CoLab UAS team will add a new state-of-the-art layer to data and image collection to elevate the monitoring of coral reef ecosystems. This project will fill immediate gaps by providing outreach imagery and begin the pursuit of developing large area, high-resolution aerial coral reef monitoring techniques.

For more information, contact: Keolohilani.Lopes@noaa.gov



Left: Brian Hauk taking off with the UAS from the launch table. Center: Brian Hauk demonstrating flight maneuvers for the trainer. Right: Jason Leonard adjusting the antennae of the controller prior to starting the UAS.

Education & Mokuāpapa Discovery Center Highlights

Celebrating 15 years as a Marine National Monument: The Impact of Large-Scale MPAs.

June 15 marked the fifteenth anniversary of Papahānaumokuākea as a Marine National Monument. As part of the [National Marine Sanctuaries Webinar Series](#), and the Mokuāpapa Third Thursday by the Bay Lecture Series, Dr. Enric Sala, Explorer-in-Residence, National Geographic Society and Dr. Alan

Friedlander, Chief Scientist, National Geographic Pristine Seas celebrated this monumental milestone and emphasized the importance of large scale MPAs to ocean health and resilience. The webinar was attended by an international audience of 209 people with 582 overall registrations. Learn more about PMNM 15th Anniversary activities [here](#). If you are interested in being a guest presenter or would like more information about this webinar series, please contact Andy.Collins@noaa.gov.

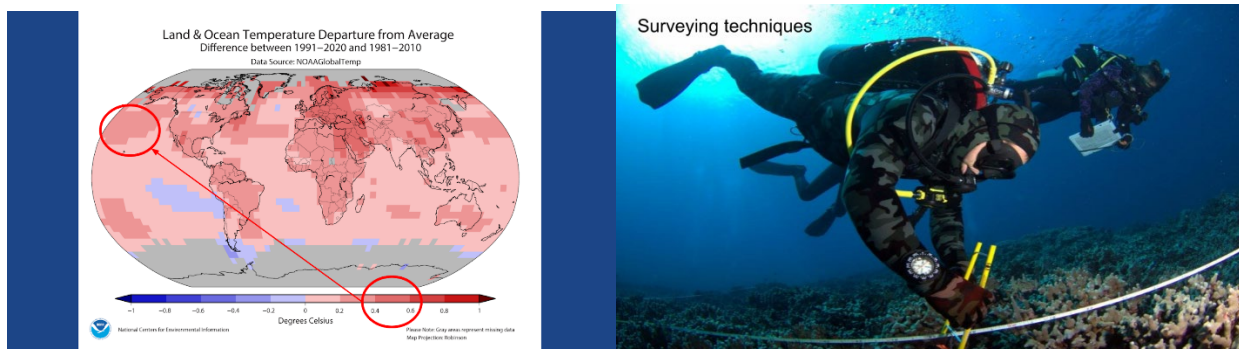


Both Dr. Sala (left) and Dr. Friedlander (right) emphasized the importance of large scale MPAs as the most effective means to support ecosystem recovery, pointing to PMNM as a global example.

Coral Bleaching and Climate Change Virtual Lesson for 8th Graders

On May 17, MDC Educators Michael Caban II-Akamai Stephens and Justin Umholtz connected with thirty marine science students from Waikoloa Middle School to discuss the impacts of climate change on coral reefs. Living near the West Hawai'i shoreline, students shared their personal observations and experiences, while learning how to analyze and interpret NOAA climate data. Michael was also able to share his experiences within the marine science field, encouraging students to join worldwide efforts to support coral reef health and resilience.

For more information contact: Justin.Umholtz@noaa.gov.

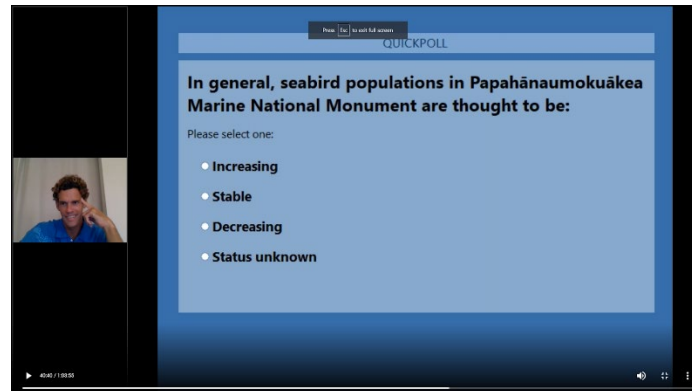


Left: Students practice reading satellite data visualizations. Right: Michael shared his experience in the University of Hawai'i QUEST program where he first learned his scientific diving skills (UH: Kuwabara)

Monitoring and Managing Seabirds in Hawai'i and the Pacific: Past, Present & Future

On May 20, as part of the [National Marine Sanctuaries Webinar Series](#) and Mokuapāpapa's Third Thursday by the Bay Lecture Series, Jared Underwood, USFWS Superintendent for Papahānaumokuākea Marine National Monument, provided an in-depth look at the decades of work to monitor and conserve seabird populations in PMNM. The webinar was attended by 248 people representing groups from across the globe. In addition to engaging with live poll questions, the

audience sent in dozens of questions related to current intervention and mitigation efforts. If you are interested in being a guest presenter or would like more information about this webinar series, please contact Andy.Collins@noaa.gov.



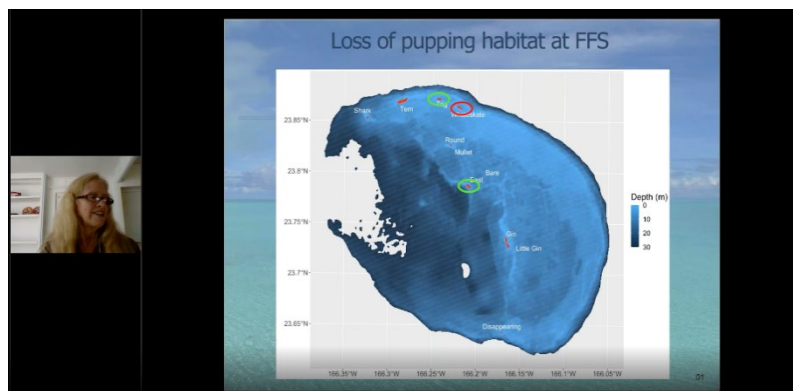
At least 75% of the audience responded to each of the poll questions, reflecting strong engagement with Jared Underwood's presentation (Photo: NOAA).

PMNM Joins University of Hawai'i Hilo for Lā Honua (Earth Day) Fair

This year the University of Hawai'i at Hilo (UHH) campus adapted its popular [Lā Honua Fair](#) into a larger week-long online event featuring speakers, performances, COVID-compliant outdoor clean-ups, and a wealth of online activities for kids and families. PMNM joined other local and regional conservation groups and shared the recently completed [Exploring a Hawaiian Coral Reef](#) video created by MDC staff to encourage reef stewardship while educating viewers on some of the life found in Hawaiian coral ecosystems. The video is also linked to PMNM's [Hidden Picture Game](#) highlighting unique animals that make their home within the Monument. For more information contact Justin.Umholtz@noaa.gov.

Hawaiian monk seal population update: signs of a fragile recovery

On April 15, as part of the [National Marine Sanctuaries Webinar Series](#) and Mokuapāpapa's Third Thursday by the Bay Lecture Series, Thea Johanos, Research and Marine Biologist for NOAA Fisheries Hawaiian Monk Seal Research Program, provided an engaging summary on Hawaiian monk seal conservation efforts. Over 360 people attended the webinar (364 attendees/643 registrants), expressing their interest through a flood of questions for the presenter. Thea was able to share population trends, survival challenges, and agency interventions to protect this highly endangered and endemic species. If you are interested in being a guest presenter or would like more information about this webinar series, please contact Andy.Collins@noaa.gov.



Thea Johanos describes climate change impacts to Hawaiian monk seal populations. (Photo: NOAA).

Hawaii Division of Aquatic Resources donates live coral to MDC

On March 22, the Hawaii Division of Aquatic Resources (DAR) donated over 1000 coral fragments to the Mokupāpapa Discovery Center (MDC). These fragments were left over from a coral growing project at the Natural Energy Laboratory of Hawaii Authority and could not be returned to the ocean. Mostly *Pocillopra meandrina* at various stages of growth, there are nine pyramid arrays (7 larger- 41 x 41cm and 2 smaller approx. 20cm x 20cm) and smaller fragments. DAR provided a special use permit to MDC to continue to grow them. In addition to the corals, various types of crabs, feather worms, and snails were also provided. All the organisms have adjusted well to the blend of synthetic sea water. The coral polyps have been observed actively feeding and come in a variety of colors including brown, green, and purple. These corals will eventually be incorporated into the main exhibit and other support systems.

For more information, contact Michael Caban at Michael.Caban@noaa.gov



PMNM Scientist Gives Online Presentations to Multiple 10th Grade Science Classes

On March 25, PMNM research coordinator Randy Kosaki gave online interactive presentations and Q&A sessions to four consecutive classes of tenth grade science students (approx. 80 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.

ONMS Program Highlights

National Academy of Public Administration (NAPA) conducts review of the national marine sanctuary system

In 2020, ONMS asked NAPA to conduct a review of the national marine sanctuary systems, as they did in 2000 and 2006. Their two earlier reports were instrumental in helping the system become what it is today. The final report was delivered in April 2021 and the over-arching theme is: The system must have a long-term goal to build itself into a more balanced, focused, and better resourced actor that can take a leading role in NOAA and across the U.S. government in protecting the marine environment.” The final report can be found [here](#).

ONMS conducts information session on the Conserving and Restoring America the Beautiful Report

Executive Order 14008 calls for 30% of U.S. lands and waters protected by 2030. ONMS is referenced repeatedly throughout this EO. There is specific language pushing for an expansion of NMS systems as well as a collaborative/interagency process looking at Fishing Management Areas. The current focus is determining HOW lands/waters qualify and are prioritized for protection and how progress is measured. The report highlights 8 core principles and 6 areas of focus, with an emphasis on real

engagement and integration/collaboration with tribal governments, indigenous communities and resource managers, and underserved areas of the U.S. The full report can be found [here](#).

ONMS welcomes the Wisconsin Shipwreck Coast National Marine Sanctuary as its' newest NMS

The 962-square mile area of Lake Michigan, named Wisconsin Shipwreck Coast National Marine Sanctuary, was designated this month by NOAA with widespread support from a diverse coalition of organizations and individuals at local, state, regional, and national levels. The sanctuary will protect and celebrate the region's maritime cultural heritage while creating unique research, educational, recreational, and tourism opportunities. The designation will officially take effect following publication of this action in the Federal Register and a 45-day review by Congress and the governor of Wisconsin. Read the full press release [here](#).

Upcoming Events

July 10 - Premiere of "Voices of Papahānaumokuākea"

July 15 - Blue Beacon Event: Celebrating the 15th Anniversary of Papahānaumokuākea

July 15 - MDC Third Thursday Webinar

"Status and Trends of Hawaiian Green Sea Turtles: Assessing Their Resilience to Climate Change"

August 19 - MDC Third Thursday Webinar

"The world does not stand still - understanding the impacts of climate change in Papahānaumokuākea"

Summer 2021 Field Season - 2 Research Cruises to be conducted on the *Imua* vessel (check out [Ku Ka Nu Hou - Newsletter June 2021](#) for more information, you can also follow along on Facebook)