

Papahānaumokuākea Marine National Monument
Agency Report to the Reserve Advisory Council
July 20 – November 3, 2016

Agency: NOAA/NOS/ONMS/PMNM
Presented by: Athline Clark, Superintendent
Date: November 16, 2016

Agency Accomplishments & Recent Activities

Agency Coordination

PMNM and FWS Host Public Listening Sessions for Proposed PMNM Expansion (AC-2.1, CBO-3.1, 3.2)

On August 1 & 2, ONMS, NMFS and FWS staff hosted two public listening sessions to gather input on the proposal to expand the Monument submitted by Hawai‘i Senator Brian Schatz. The O‘ahu session attracted approximately 400 people over the course of the four-hour meeting, with strong turnouts from both pro- and anti-expansion groups. The Kaula‘i meeting a day later saw over a hundred people in attendance. Written comments were accepted at each meeting, and at Mokupāpapa Discovery Center in Hilo on the Big Island, the ONMS Visitor Center in Kihei on Maui, and NMFS’s Pier 38 office near downtown Honolulu. Over 6,700 written comments and signatures were submitted, and 118 people provided oral comment at the two public listening sessions. All comments were reviewed by NOAA and FWS officials. For more information, please contact David.Swatland@noaa.gov.



The O‘ahu public meeting on the proposed expansion of Papahānaumokuākea.
(Credit: Sarah Marquis/NOAA Office of National Marine Sanctuaries)

President Obama expands Papahānaumokuākea Marine National Monument (CBO-3.1)

On Friday, August 26, 2016, President Obama signed a proclamation expanding Papahānaumokuākea Marine National Monument. Previously the largest contiguous fully-protected conservation area in the United States at 139,797 square miles (362,073 km²), the expanded boundaries make it once again the biggest protected area on the planet at 582,578 square miles (1,508,870 km²), nearly the size of the Gulf of Mexico. For more information, contact Athline.Clark@noaa.gov.

PMNM Makes a Significant Splash at IUCN World Conservation Congress (AC-2.1, CBO-2.3, 3.1, 3.3,)

From September 1-10, PMNM staff, leadership and partners participated in the IUCN’s World Conservation Congress, held in the United States for the first time ever, attended by nearly ten thousand delegates representing 192 nations. PMNM staff participated in various activities and presentations, summarized below.

- NOAA Superintendent for PMNM Athline Clark presented an e-poster on behalf of the Monument Management Board highlighting the significance of the Monument. The e-poster was a coordinated effort

among the seven co-managing agencies, led by ONMS-PMNM staff. View the e-poster here: <https://portals.iucn.org/congress/session/10101>. For more information, contact Athline.Clark@noaa.gov.

- NWHICRER Advisory Council Chair Tim Johns and PMNM Communications Manager Toni Parras appeared on Hawaii News Now’s “Sunrise on the Road” live from the congress to talk about the Monument expansion. Tim and Toni talked about the significance of the expansion and the resources found in the expansion area. For more information, contact Toni.Parras@noaa.gov or view the clip at <http://www.hawaiinewsnow.com/clip/12705274/papahanaumokuakea-expansion>.



PMNM Communications Manager Toni Parras (left) and Reserve Advisory Council Chair Tim Johns (right) appear on live TV from the U.S. pavilion at the congress to talk about Monument expansion. (Credit: Hawaii News Now)

- PMNM Education Coordinator Andy Collins coordinated the One-NOAA booth in the exhibit center, where approximately 15,000 visitors, residents and congress participants learned about NOAA and the work we do in the Pacific. More than 60 NOAA staff manned the NOAA displays across seven days from 8 AM to 10 PM. It was the largest coordinated One-NOAA outreach event ever conducted in the Pacific, with all line offices and NOAA affiliated organizations represented, including social media and media coordination staff from ONMS. Free public access to the exhibit hall from 11 AM to 5 PM allowed many Hawai‘i residents, visitors and their families to experience the conference and learn about conservation efforts around the world. The student day brought in more than 1,000 K-12 Hawai‘i students, who visited the exhibits and drafted their own motions for conservation. The 30 feet of standing wall displays featuring a unified NOAA branding that were produced for the event are now available for regional outreach in the Pacific, along with talking points and NOAA personnel experienced in conducting public outreach. For more information contact Andy.Collins@noaa.gov.



Visitors enjoy the educational activities at the One-NOAA booth. (Credit: NOAA)

- PMNM Education Coordinator Andy Collins and Web Applications Developer Jonathan Geyer gave presentations at the U.S. Pavilion’s Tech Corner to talk about the design, development and deployment of [interactive kiosk software](#) created for the Mokupāpapa Discovery Center in Hilo. Andy’s presentation focused on the purpose of the kiosk and its significance in educating visitors about the Monument, while Jonathan spoke about the technical and practical aspects of building and deploying the kiosk. For more information, contact Andy.Collins@noaa.gov.
- PMNM Data Team members David Graham and Jonathan Geyer collaborated with the Office of Coastal Management to provide over 60 hours of staffing support for NOAA's presentation globe, [Science on a Sphere](#) in the U.S. pavilion. They were on hand to attend to technical issues and assist presenters; however the greatest impact was interacting with congress visitors to answer questions and demonstrate the breadth and detail of NOAA data on the spherical display. For more information, contact David.Graham@noaa.gov.



ONMS Acting Director John Armor and the Ocean Agency’s Richard Vevers present “A Virtual Visit to U.S. Marine National Monuments and Sanctuaries.” (Credit: Jonathan Geyer/NOAA)

- PMNM Native Hawaiian Program Specialist Kalani Quiocho spoke on a panel for the U.S. Pavilion event “Building Pacific Partnerships – Ocean Exploration to Inform Resource Management” alongside Dr. Kathy Sullivan and Dr. Alan Leonardi, Director of the Office of Ocean Exploration and Research. Kalani spoke about the significance of the ocean within Pacific Island cultures and the perspectives and beliefs related to ocean stewardship and exploration. During another U.S. Pavilion event, “Connecting People to Natural and Cultural Marine Heritage Through Special Places,” Kalani shared about the work being done in Papahānaumokuākea by co-managing agencies and their partners that focuses on the integration of natural and cultural heritage, including Native Hawaiian approaches to resource management. During an Ocean Pavilion event hosted by the UNESCO World Heritage Marine Programme to release the World Heritage report 44 entitled *World Heritage in the High Seas: An Idea Whose Time Has Come*, former and current students of Kū‘ula, a marine science class at the University of Hawai‘i at Hilo (UHH) that integrates traditional Hawaiian knowledge systems, performed traditional chants and dances to open the event. The students were accompanied by their professor, creator of Kū‘ula, Dr. Misaki Takabayashi, currently Interim Associate Dean for the College of Arts and Sciences at UHH. For more information, contact Kalani.Quiocho@noaa.gov.



PMNM Native Hawaiian Specialist Kalani Quiocho speaks during the Building Pacific Partnerships panel in the U.S. pavilion at the congress. (Credit: NOAA)

- On September 3, NOAA Superintendent for PMNM Athline Clark participated in a WCC workshop hosted by the National Parks Service and the International Council on Monuments and Sites (ICOMOS), on nature-culture interlinkages and the evolution in thinking on the matter in the World Heritage Convention, including the 'Connecting Practice' project. The focus of the workshop was to discuss key challenges on integrating natural and cultural heritage and possible solutions to these challenges across a variety of World Heritage sites from across the globe. ICOMOS is working with IUCN to better integrate culture into the daily management of natural sites across all World Heritage sites. For more information, contact Athline.Clark@noaa.gov.
- On September 3, Big Ocean Coordinator Nai'a Lewis led a workshop on the "Guidelines for the Design and Management of Large-Scale MPAs" with panel members from the IUCN WCPA Large-Scale MPA Task Force. Developed by Big Ocean and published in partnership with the LSMPTA Task Force, this publication is the first of its kind, specific to the needs of marine conservation professionals working at-scale. A great deal of support and interest was generated for the Guidelines, making it clear that it is a timely and sorely needed resource for managers, as well as policy makers and communities considering scaling up their marine protection efforts. For more information, contact Naia.Lewis@noaa.gov.
- On September 5, the organizers of the 3-day Think Tank on Human Dimensions of LSMPAs, which included Big Ocean members and PMNM leadership, presented a workshop on the Think Tank Framework. Participants were provided with an outline of the Framework and invited to contribute to an ongoing conversation around the importance of human dimensions research, the most critical gaps and how best to prioritize next steps. A community of practice around human dimensions research specific to LSMPAs is growing and this workshop helped to increase the momentum and solidify core research topics. For more information, contact Naia.Lewis@noaa.gov.
- On September 6, PMNM hosted Big Ocean's 8th network business meeting. As a founding member site of the only network that supports marine conservation and management at-scale, PMNM helped facilitate discussions around the top priority objectives of building management and network capacity, as well as prepare for presentations at IMPAC4. The meeting was attended by nearly all member sites and the synergy around peer learning and sharing lessons learned was palpable. Member managers walked away from this meeting appreciating the consistent administration that PMNM has provided over the six years since the network's inception, and for the need to create space and time for more in-depth discussions around fundraising and long-term member services. For more information, contact Naia.Lewis@noaa.gov.

Chinese Maritime Policy Expert Seeks Out PMNM for Information Sharing (CBO-3.1)

On September 29, Deputy Superintendent David Swatland met with Mr. Xinbo Zhang at NOAA's IRC in response to a request from Hawaii's Pacific & Asian Affairs Council for PMNM to host a visiting Chinese maritime policy expert as part of its International Visitor Leadership Program (IVLP). Mr. Zhang, an Associate Professor at the Institute of Maritime Studies, China Institutes of Contemporary International Relations (CICIR), oversees CICIR's research on a wide variety of maritime issues, including resource protection and territorial

disputes in the South China Sea. This is Mr. Zhang's second visit to the U.S.; during this trip, he also met with various military, government, and academic officials and staff in Washington, D.C., New York City and Los Angeles. Topics discussed at the IRC meeting include PMNM management and threats, research and enforcement, agency cooperation, commercial fishing impacts, and what makes a successful MPA. For more information, contact David.Swatland@noaa.gov.

PMNM Communications Team Holds Quarterly Meeting (AC-2.1, CBO-2.1)

On October 13, the Monument Communications Team (MCT) met at the IRC for the last quarterly meeting of 2016. The MCT discussed various outreach material (brochure, posters, video, website) updates related to the Monument expansion, brainstormed 2017 campaign ideas, and more. MCT representatives from NOAA, USFWS, State Department of Land and Natural Resources and OHA participated. For more information, contact Toni.Parras@noaa.gov.

PMNM Monument Management Board holds quarterly meeting (AC-2.1)

On October 19, the PMNM Monument Management Board (MMB) held its regularly scheduled quarterly meeting at NOAA's IRC on Ford Island. All four federal agencies had their primary representatives there, while the State of Hawai'i DLNR Division of Aquatic Resources and the Office of Hawaiian Affairs were represented by alternates. The State of Hawai'i Division of Forestry & Wildlife was not represented but quorum was still achieved. Topics of discussion included planning for Management Plan Review (MMPR) and potential Sanctuary designation, what role the NWHI CRER Advisory Council should play in these processes, and updates on the MOA revision to include OHA as the fourth Co-Trustee and the Resource Monitor policy as well the preparations for the 75th anniversary of the Battle of Midway commemoration. The Board also heard from NFWF representative Michelle Pico on her organization's efforts to process contributions for NWHI research activities. The NMFS representative provided a follow-up to the recently concluded WesPac meetings and the process to develop new fisheries regulations for the Monument Expansion and the DAR representative provided a briefing on the recently failed effort to salvage the excavator from Kure Atoll lagoon. Dates for 2017 MMB meetings and the 2017 officer's slate will be determined at the December 8 meeting; the MMB has been meeting several times a month on issues such as the MOA, MMPR, and Resource Monitor policy. For more information, contact Athline.Clark@noaa.gov.

PMNM Supports Community in Hālawā Valley, Birthplace of Papahānaumoku (NHCH-5)

On November 2, PMNM staff visited a culturally significant site called Hale o Papa, located on O'ahu in Hālawā Valley, which is the birthplace of Papahānaumoku. The Monument is the namesake of both Papahānaumoku and Wākea, who are revered ancestors of Hawaiians and the progenitors of the Hawaiian Archipelago. The PMNM staff were hosted by a grassroots organization called Nā Kūpuna A Me Nā Kāko'o O Hālawā, which translates as "The Elders and Supporters of Hālawā." The organization is made up of lineal descendants and community members who are working to bring back health and well-being to the valley, after the displacement and destruction that was caused by the development of the John A. Burns Freeway. PMNM staff members were accompanied by several Office of Hawaiian Affairs staff, a co-managing agency of the Monument. The group participated in traditional protocols, gathered ferns to make salad, harvested taro and removed a large area of invasive plants. All of these activities reinforce traditional ways of developing intimate relationships with place and people of place, which is how traditional Hawaiian society learned to thrive. One of the responsibilities of the PMNM Native Hawaiian Program is to integrate Native Hawaiian values and concepts into the overall management of the Monument, which is also a mixed natural and cultural World Heritage Site. In order to achieve this, it is important to provide meaningful in-reach for PMNM staff that allows Hawaiian culture to be accessible and relevant to our work. This visit to Hālawā Valley helped our staff to further realize the extent of our kuleana, our responsibility, to manage this ancestral place. For more information, contact Kalani.Quiocho@noaa.gov.



PMNM and OHA staff members work to clear out invasive species at Hālawā Valley. (Credit: Toni Parras/NOAA)

Constituency Building & Outreach

Papahānaumokuākea Featured in Hawaiian Airlines Magazine Hana Hou! (AC-2.1, CBO-2.2, 2.3)

On August 1, Hawaiian Airlines inflight magazine Hana Hou! published its August/September issue featuring a cover story about Papahānaumokuākea and its ten year anniversary. The article, which highlights the accomplishments made during a decade of exploring, researching, conserving and managing the Monument, was written by Pulitzer Prize-winning author Ken Weiss, who joined the PMNM Deep Reef Expedition aboard NOAA Ship *Hi'ialakai* in June. With support from all co-managing agencies, Ken was able to visit the Hawaiian Islands National Wildlife Refuge, Midway Atoll National Wildlife Refuge, and Kure Atoll State Wildlife Sanctuary within the Monument. Hana Hou! is the publication of the biggest airline carrier in the state, printing 115,000 copies per issue and potentially reaching over a million passengers and subscribers per issue. PMNM staff worked with the magazine publisher to time the release to coincide with the IUCN World Conservation Congress (in Honolulu from September 1-10, 2016), when thousands of conservation managers and delegates from around the world traveled to Hawai'i. This timing was the perfect opportunity to reach many high level conservation managers and decision-makers and share the accomplishments of the Monument. For more information contact Toni.Parras@noaa.gov or view the article online at <http://hanahou.us/issues/19.4/feat-nw-hawn-islands.html>.

PMNM Featured in New Exhibit at Bishop Museum (AC-2.1, CBO-2.3, 3.1, 4.4)

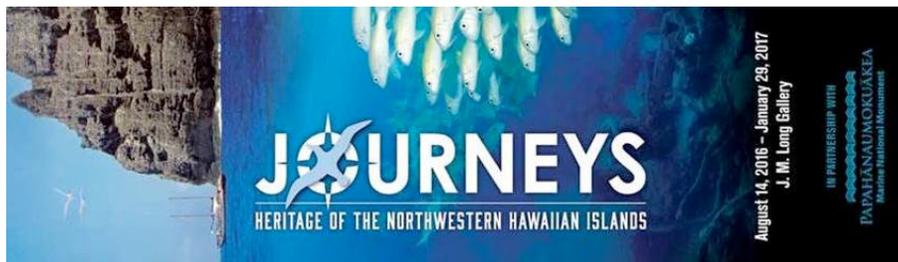
On August 14, Bishop Museum, in partnership with PMNM's managing agencies and partners, opened a new exhibit on the Northwestern Hawaiian Island. Bishop Museum is the premier natural and cultural museum of the Pacific with more than 200,000 visitors per year. The new exhibit is titled "Journeys: Heritage of the Northwestern Hawaiian Islands" and features informative panels, cultural artifacts, an interactive flight simulation of the Battle of Midway, a virtual dive, and historical content. PMNM staff provided much of the content for the exhibit and worked closely with the museum's designers and scientists. The exhibit also features many items from the museum's extensive cultural collection, including eight stone images (Ki'i) from Mokumanamana on display together for the first time anywhere. The exhibit, which opened on August 14 (timed to be ready for the 10,000+ attendees of the IUCN World Conservation Congress held in Honolulu this September) will run until January 29, 2017. For more information contact Andy.Collins@noaa.gov or Toni.Parras@noaa.gov or visit: <http://www.bishopmuseum.org/journeys/>.



Left: Bishop Museum's new "Journeys: Heritage of the Northwestern Hawaiian Islands" exhibit opens in time for the IUCN World Conservation Congress in Honolulu. Right: The exhibit features stone images (Ki'i) from the island of Mokumanamana on display together for the first time. These images represent ancestral connections to Hawaiian deities and are significant in the genealogy of the Hawaiian people. (Credits: Andy Collins/NOAA)

PMNM Celebrates Journeys Exhibit at the Bishop Museum (AC-2.1, CBO-2.3, 3.1, MCS-3.4)

On September 7, PMNM staff and partners gathered for a special viewing of Journeys: Heritage of the Northwestern Hawaiian Islands exhibit at the Bishop Museum in Honolulu. After the viewing the exhibit, guests attended a special edition Traditions of the Pacific lecture featuring Bishop Museum's Director of Cultural Resources Dr. Mara Mulrooney, who talked about her recent expedition to Nihoa, and Associate Zoologist Dr. Richard Pyle, who spoke about research and discoveries in the Northwestern Hawaiian Islands and highlighted the discovery of a newly-described butterflyfish species from the Monument by Pyle and PMNM's Randy Kosaki. Immediately following the lecture, guests went to view the live specimens of the fish in an aquarium within the museum's Science Center. Approximately 100 people were in attendance. For more information, contact Toni.Parras@noaa.gov.



Left to right: Journeys exhibit banner; Bishop Museum scientists give lecture; newly-described butterflyfish from the Monument on display at the museum's Science Center. (Credits: Bishop Museum; Toni Parras/NOAA)

PMNM Featured on Live-Streaming Talk Show (CBO-3.1, MCS-3.4, OEL-2.2)

On September 20, PMNM staff made a two-part appearance on the “Sustainable Hawaii” live streaming talk show with Kirsten Baumgart Turner and Carol Mon Lee on ThinkTech Hawaii. The mission of ThinkTech Hawaii is to raise public awareness for a better Hawaii and to be the leading digital media platform promoting civic engagement in Hawaii. The show streams live on their website and livestream.com and on demand at YouTube.com. The show “Sustainable Hawaii” averages 200 hits per show, while Thinktech overall received over 700,000 hits on its YouTube channel in the last two years and is growing. PMNM Communications Manager Toni Parras and Education Specialist Kainoa Kaulukukui-Narikawa talked for an hour about the natural and cultural significance and uniqueness of the Monument, its recent expansion and discoveries, threats to PMNM and what people can do to help and get involved, and the Navigating Change Program. For more information, contact Kainoa.Kaulukukui@noaa.gov.

PMNM Presents at Waikīkī Aquarium on Monument Expansion (CBO-2.3, 3.1, MCS-3.4)

On October 19, ONMS-PMNM Deputy Superintendent Dr. Randy Kosaki gave a seminar presentation on the Monument expansion to a group of 25 volunteers and staff at the Waikīkī Aquarium. After the talk, Dr. Kosaki answered questions from approximately 30 aquarium visitors in front of the NWHI tank and exhibit, where volunteers also handed out posters about the expansion area and deep water habitats of the Monument. For more information, contact Randall.Kosaki@noaa.gov.

Mokupāpapa Featured on KHON2’s “Hawai’i Island Week” (CBO-3.1, MCS-3.4, OEL-2.2)

On October 20, Mokupāpapa Discovery Center was featured in two segments on KHON2’s Hawai’i Island Week: Wake Up 2Day and Living 808 with host Tai Brazen. MDC Educator Justin Umholz and volunteer Alex Lau talked about the education opportunities at MDC and instructed Tai in a gyotaku fish printing activity. For more information, contact Justin.Umholz@noaa.gov or visit <http://khon2.com/2016/10/20/hawaii-island-week-mokupapapa-discovery-center/>.

NOAA Superintendent for PMNM Interviewed for Midway Film (AC-2.1, CBO-2.2, 2.3)

On October 24, Athline Clark was interviewed for a film that is being produced by the U.S. Fish and Wildlife Service Refuge’s Program in honor of the 75th Anniversary of the Battle of Midway. The Commemoration of the Battle of Midway will take place in June 2017. Clark was interviewed by filmmakers from Tandem Productions about PMNM and its significance biologically, culturally and historically. For more information, contact Athline.Clark@noaa.gov.

PMNM supports Outrigger Resorts and Polynesian Voyaging Society (AC-2.1, CBO-3.1, NHCH-2)

On November 2, PMNM staff attended an event to celebrate the launch of “The Outrigger Journey” in-room book and honor the Polynesian Voyaging Society’s (PVS) Mālama Honua Worldwide Voyage. PVS and Outrigger Resorts are both long-time partners of ONMS. The Outrigger Journey 2017 book, which has a readership of 354,000+ and circulation of 4,700 books, features a story on the two ONMS sites in Hawai’i: the Hawaiian Islands Humpback Whale National Marine Sanctuary and Papahānaumokuākea Marine National Monument. The feature was co-authored by PMNM Communications Manager Toni Parras and Shannon Lyday-Ruseborn and includes many stunning pictures from both sites. Leadership from Outrigger Resorts, PVS and Morris Publishing gave presentations, and books were provided to all guests. Approximately 100 people attended. For more information, contact Toni.Parras@noaa.gov or view the book online: https://issuu.com/morrismedianetwork/docs/hawaiian_outrigger_sept_2016

Education

PMNM Participates in Waikīkī Aquarium’s Marine Educators’ Night (CBO-3.1)

On October 7, PMNM hosted a booth at the Waikīkī Aquarium’s Marine Educators’ Night, where representatives from State and Federal organizations and education non-profits provided free instructional materials for classroom teachers. The annual program is sponsored by NOAA’s Ocean Explorer program and the National Marine Sanctuary Foundation. PMNM Education Specialist Kainoa Kaulukukui-Narikawa and FWS Education Specialist

Amy Olliffe passed out educational materials and networked with the approximately 100 educators who attended the event. For more information, contact Kainoa.Kaulukukui@noaa.gov.

PMNM Presents Hawaiian Monk Seal Lesson to Kailua Intermediate Students (CBO-3.1)

On October 24, PMNM staff taught seventh graders at Kailua Intermediate a lesson on the Hawaiian monk seal and highlighted the latest monk seal research. This lesson acted as a culminating experience after a series of Hawaiian monk seal lessons including a crittercam behavior coding activity and a simulated scat analysis. PMNM Education Specialist Kainoa Kaulukukui-Narikawa, NMFS Biological Technician Brenda Becker, FWS Education Specialist Amy Olliffe, FWS Volunteer Barbara Mayer and FWS intern Kristy Lapenda gave six 45-minute presentations followed by Q&A. Approximately 385 students and five teachers were in attendance. For more information, contact Kainoa.Kaulukukui@noaa.gov.

PMNM Teaches Monk Seal Lesson to Lunalilo Elementary Students (CBO-3.1)

On October 27, PMNM staff taught second graders at Lunalilo Elementary a lesson introducing PMNM with a focus on the Hawaiian monk seal and featuring the researchers that study the endangered species. Students rotated between five Hawaiian monk seal stations including crittercam observation, scat and spew, anatomy, marine debris entanglement and tracking technology. PMNM Education Specialist Kainoa Kaulukukui-Narikawa, NMFS Biological Technician Brenda Becker, FWS Education Specialist Amy Olliffe, FWS Volunteer Barbara Mayer and FWS intern Kristy Lapenda planned and coordinated the lesson. Approximately 40 students and three teachers were in attendance. For more information, contact Kainoa.Kaulukukui@noaa.gov.



FWS Education Specialist Amy Olliffe leads Lunalilo students in a discussion about Hawaiian monk seal marine debris entanglement. (Credit: Kainoa Kaulukukui-Narikawa/NOAA)

PMNM Supports Navigating Change Program at Camp Mokule‘ia (CBO-3.1, OEL-1.1)

On October 20 and 21, the Navigating Change program at Camp Mokule‘ia hosted 70 seventh grade students, 21 eleventh grade students, and eight teachers from La Pietra Hawaii School for Girls. The Navigating Change overnight camp is designed to be a culminating experience for schools using the Navigating Change Teachers Guide. The program hopes to change behaviors by rooting students in indigenous Hawaiian cultural knowledge, creating an awareness of ecological problems and demonstrating how daily decisions can help resolve those problems. Camp Mokule‘ia Program Directors and PMNM Education Specialist Kainoa Kaulukukui-Narikawa led students through a series of educational activities over two days, including: a marine debris clean-up and sort;

an albatross lesson and bolus examination; a plankton and sand lesson; a night sky observation that included constellation and star identification; a lesson on the Hawaiian star compass, celestial navigation and wayfinding; an invasive plant removal and native plant outplanting; and various other PMNM-centered educational games. For more information, contact Kainoa.Kaulukukui@noaa.gov.



La Pietra students gather for instructions before an ice-breaker activity. (Credit: Kainoa Kaulukukui-Narikawa/NOAA)

Mokupāpapa Discovery Center (MDC) Highlights (MCS-3.4; CBO-3.1; OEL-1.6)

Since July 20, 2016, the Mokupāpapa Discovery Center has welcomed more than 7,000 visitors. MDC staff also participated in numerous outreach and educational activities, highlighted below.

- On July 27, MDC held a workshop for small business owners on Electricity Savings, Simple Solutions and Disaster Preparedness.
- On August 12, MDC staff and volunteers welcomed Senator Brian Schatz.



Left: MDC staff with Senator Brian Schatz. (Credit: NOAA) Right: Shijiazhuang High School students learning about NWHI and the importance of apex predators. (Credit: Connie Larsen/Tour Group Hawaii)

- MDC hosted students from the Integrated Science Learning Experiences (ISLE) Project in Oregon, which has been bringing students to Mokupāpapa for over 10 years.
- MDC hosted County of Hawai'i Senior Nutrition Program visitors, who learned about the formation and importance of PMNM through films and accessible exploration activities.
- MDC hosted ninth grade students visiting from Shijiazhuang High School in China.

- MDC was approved as a destination for Kokua Hawai'i Foundation Field Trip Grants, which offers financial assistance to Hawai'i public schools that otherwise could not afford to participate in environmental field trips (kokuahawaii.org/fieldtrips/destinations/mokupapapa_discovery_center_for_hawaiis_reefs#page).
- In September, PMNM Native Hawaiian Specialist Kalani Quiocho brought delegates from the Rapa Nui community and the National Park Service to meet with MDC staff to discuss future project partnerships and to showcase MDC as the gateway to PMNM as a World Heritage Site.
- MDC education staff visited Ke Kai Ola, the Kona-Kailua-based Hawaiian Monk Seal rehabilitation center, a part of the California-based Marine Mammal Center (TMMC). TMMC educators Sara Weisberg and Jenn Walker, and Operations Director Deb Wickham, shared resources, discussed future collaborations, and outlined the Monk Seal Curriculum being developed. They plan to pilot the year-long curriculum with middle school teachers on Hawai'i Island, with field trips to MDC.
- The Nature Conservancy China Office brought a group of Chinese high school students to MDC to learn about PMNM, conservation education, and careers in conservation/science before the IUCN conference. Public Engagement Coordinator Xinchun Wei and his students also shared their own conservation efforts and challenges, as well as their hopes for future collaborations and exchanges.
- The State of Hawai'i Department of Aquatic Resources (DAR) held a two-day workshop on Anchialine Pools at MDC, bringing more than 60 scientists and managers to present current research, shared struggles, and effective management strategies.
- MDC staff participated in Hawai'i Volcanoes National Park's Annual Bioblitz, Biodiversity and Cultural Festival. More than 2,000 visitors participated in the event, with 372 engaging directly with MDC staff.



Left: Volunteer Joey Smith mans the PMNM booth at the HAVO Cultural Festival. Right: Joey teaches visitors how to make origami fish. (Credits: Justin Umholtz/NOAA)

- MDC hosted the Hawai'i Wildlife Fund's (HWF) 20th Anniversary Celebration, honoring HWF conservation efforts and the people who stewarded the organization through the last twenty years. More than 100 people participated in the festivities, including guests from around Hawai'i Island, Maui, O'ahu, and Oregon. Local and state public officials and philanthropists, including former Mayor Harry Kim.
- California State University Channel Islands group enjoyed an educator-led tour focusing on environmental management and blogged about their visit to Hawai'i Island at <http://hawaii.piratelab.org/>.
- The Office of Hawaiian Affairs hosted their Grant Writing Workshop in our Learning Center that empowered their employees to find greater opportunities to further the conservation of Hawaiian lands.

Research & Field Operations

Alien Species Surveys Conducted in PMNM (AS-2.1, P-2.4)

On July 22, PMNM staff returned from 17 days at Midway Atoll National Wildlife Refuge located within the Monument. PMNM Resource Protection Specialist Scott Godwin conducted extensive fieldwork monitoring marine ecosystems as part of the PMNM Resource Protection Program Marine Alien Species Survey Project, and

presented to USFWS Refuge staff on the status of the project. Midway Atoll has the highest level of established marine alien species in the Monument; regular monitoring of established species increases ability to effectively manage PMNM resources. PMNM Policy Specialist Pua Borges-Smith assisted in field operations and met with Refuge staff on PMNM permitting and reporting procedures as they pertain to USFWS activities conducted under the Manager's permit. For more information, contact Pua.Borges-Smith@noaa.gov.

PMNM Participates in Hawai'i Marine Debris Action Plan Workshop (AC-2.1, MD-1.3)

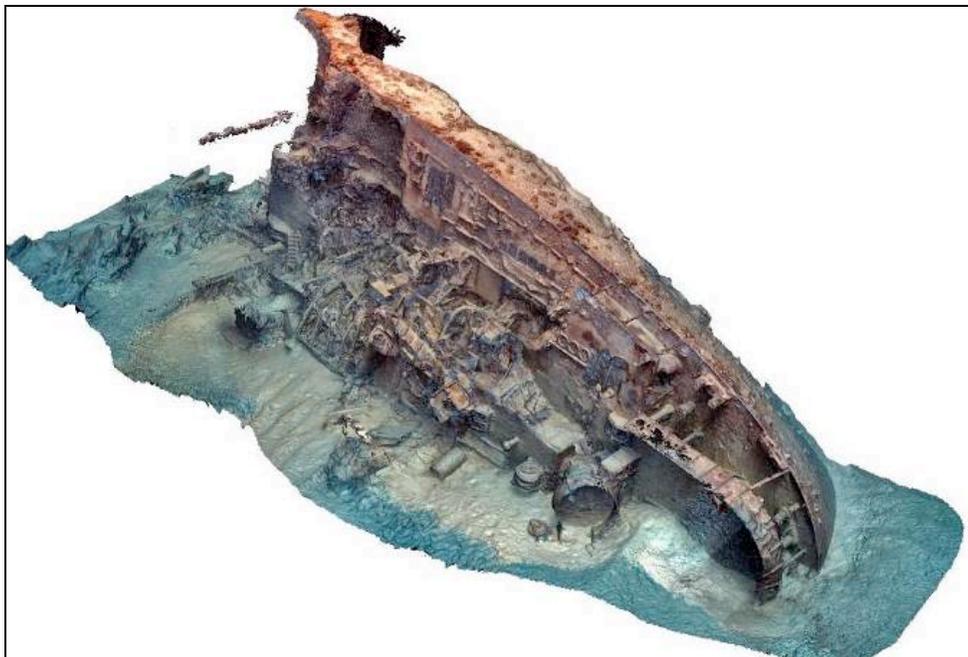
On July 25-27, PMNM Resource Protection Specialist Scott Godwin participated in the Hawai'i Marine Debris Action Plan (HIMDAP) Workshop. This effort was sponsored by the NOAA Marine Debris Program's Pacific Islands Region. A workshop for the HIMDAP is held every two years with the non-profit community, public sector and private sector entities to adjust goals, strategies and actions from the 2014 HIMDAP. The adjustment of the components of the HIMDAP every two years makes it a dynamic document with broad coverage of issues pertaining to marine debris. For more information, contact Scott.Godwin@noaa.gov.

PMNM Hosts Workshop on Alien Species and Biofouling of Maritime Vessels (AC-2.1, AS-1.2)

On July 27, PMNM Resource Protection Specialist Scott Godwin conducted a workshop on Alien Species and Biofouling of Maritime Vessels. It was attended by Monument field staff and State of Hawai'i Department of Land and Natural Resources, Division of Aquatic Resources staff. In order to protect the fragile ecosystem of the NWHI, all vessels accessing the Monument need to be inspected for the presence of marine alien species prior to approval of an entry permit. The workshop was conducted to strengthen the vessel inspection process and build capacity within agencies to conduct these inspections in the future. For more information, contact Jason.Leonard@noaa.gov.

PMNM Maritime Heritage Research to be Featured in International Scholarly Journal (CBO-3.1, MH-2.1)

Researchers from East Carolina University, University of Hawai'i, and PMNM collaborated to produce a publication describing the history, discovery and interpretation of USNS *Mission San Miguel* shipwreck site at Maro Reef in the Northwestern Hawaiian Islands. In August 2015 a team of maritime archaeologists working in PMNM solved the mystery of the exact location of the site after it was wrecked on the reef in October 1957. The article will be published in Volume 40 of the Australian Institute of Maritime Archaeology's *Bulletin*, an international scholarly peer reviewed journal published annually. The article will also include 3D imagery of the site collected by John Burns of the University of Hawai'i during 2015 field work. For more information contact Kelly.Keogh@noaa.gov.



3D image of stern section of USNS Mission San Miguel. (Credit: John Burns/UH)

PMNM Supports Monk Seal and Unmanned Aircraft System (UAS) Expedition (AC-2.1, TES-1.3; TES-3.1; CBO-1.5; CBO-2.3)

From August 3-8, David Graham (PMNM data integration group program manager), Justin Rivera (PMNM policy and permit specialist), and Kahi Fujii (PMNM graphic/web designer) assisted with the monk seal and UAS expedition aboard NOAA Ship *Oscar Elton Sette* as part of the NOAA Pacific Islands Fisheries Science Center (PIFSC) monk seal research and recovery efforts at Nihoa, Mokumanamana and French Frigate Shoals. The expedition's lead scientist, Stacie Robinson, PhD (Hawaiian Monk Seal Research Program research ecologist), and her team conducted seal censuses and surveyed pups that would get rehabilitative care at the Marine Mammal Center's Ke Kai Ola monk seal hospital in Kona, Hawai'i. A team led by Charles Littnan, PhD (Hawaiian Monk Seal Research Program lead scientist) and Jacob Barbaro (NOAA Office of Marine and Aviation Operations), used the APH-22 hexacopter to map a portion of Tern Island to document hazards to monk seals and other wildlife. Lee Ann Woodward, PhD (USFWS resource contaminants specialist) and Bill Robberson, PE, USPHS (US EPA Region 9) conducted an assessment of Tern Island's landfills in order to determine the best solution for removing any contaminants. Robby Kohley (Pacific Rim Conservation avian ecologist), Megan Dalton (Pacific Rim Conservation biologist), Hoku Ka'aekuahiwi (NOAA Fisheries Pacific Islands Regional Office natural resource policy management specialist) and Kahi Fujii searched GPS points in order to remove invasive *Cenchrus echinatus* on Nihoa and discovered that the invasive species had been eliminated. To learn more about the expedition, view the PIFSC site: <https://pifsc-www.irc.noaa.gov/cruise/se1605.php>. For more information, contact David.Graham@noaa.gov or Kahi.Fujii@noaa.gov.

PMNM Conducts Survey Training for Upcoming Research Cruise to NWHI (MCS-1.1, 1.2)

On August 15-19, PMNM staff members Hadley Owen and Brian Hauk, with assistance from NMFS PIFSC Coral Reef Ecosystem Program (CREP) staff Dione Swanson and Kaylyn McCoy, conducted fish stationary point count and benthic coral survey training in preparation for the Reef Assessment and Monitoring Program (RAMP) Research Cruise to the Monument scheduled for August 29-September 30. The team trained undergraduate interns from the University of Hawai'i with lectures, exams, in-water practical training and review sessions. NOAA diving standards, rescue drills and safety equipment were also reviewed as part of preparation for ship based diving operations. For more information, contact Brian.Hauk@noaa.gov.



Left: (left to right starting at bottom) Students Ashley Pugh and Emily Wallingford with instructors Kaylyn McCoy, Dione Swanson and Brian Hauk after dive training sessions. (Credit: Hadley Owen/NOAA) Right: UH Diver Emily Wallingford practices sizing fish models during survey practice. (Credit: Brian Hauk/NOAA)

Scientists Describe New Species of Deep Reef Butterflyfish from PMNM (MCS-3.4; CBO-3.1)

On September 6, Bishop Museum scientist Richard Pyle and NOAA Deputy Superintendent for PMNM Randy Kosaki published a description of a new species of butterflyfish from the deep coral reefs of PMNM. The new fish is named *Prognathodes basabei* in honor of Pete Basabe, a veteran diver and tropical fish collector. In addition to the specimens used for the published study, live specimens of the new butterflyfish were collected at depths between 200 and 330 feet on a NOAA expedition to Papahānaumokuākea in June of this year. The live fish are now on public display in aquaria at the Bishop Museum and the Waikiki Aquarium in Honolulu and at the Mokupāpapa Discovery Center in Hilo. Holotype and paratype specimens collected on cruises in 2015 and 2016 have been placed in research collections at Bishop Museum, the California Academy of Sciences, and the Smithsonian Institution. The article, entitled “*Prognathodes basabei*, a New Species of Butterflyfish (Perciformes, Chaetodontidae) from the Hawaiian Archipelago,” can be accessed online at <http://dx.doi.org/10.3897/zookeys.614.10200>. For more information, contact Randall.Kosaki@noaa.gov. Radio Clip: <http://hawaiipublicradio.org/post/conversation-thursday-september-8th-2016>.



Left: Prognathodes basabei, a new species of butterflyfish just described from PMNM’s “coral reef twilight zone.” (Credit: Greg McFall/NOAA) Right: Richard Pyle (left) and Randy Kosaki (right) in front of the tank display at Bishop Museum. (Photo courtesy of Bishop Museum)

PMNM Field and Research Team Hold Strategic Meeting (CO-1.1)

On September 12, the PMNM Field and Research Team held a strategic meeting to discuss how best to accomplish scientific goals in the newly expanded Monument. Team members discussed current roles and responsibilities, the Superintendent’s vision for the team, strategic analysis, and long-range planning. The meeting wrapped up an ambitious and successful field and research season and started mapping out the direction of the program’s future. For more information, contact Jason.Leonard@noaa.gov.

Climate Change Vulnerability Assessment for PMNM

Within a global context, the coral reef and low island ecosystems of the Papahānaumokuākea Marine National Monument (PMNM) are among the places most vulnerable to climate change. The Monument’s northernmost atolls may also be some of the first reef systems globally to be impacted by changing ocean chemistry, thus providing early indications of broader indications to come. Recognizing these likely impacts, the PMNM Monument’s Management Board (MMB) has identified climate change as the most significant threat to this unique World Heritage site, and in collaboration with its partners has developed this Climate Change Vulnerability Assessment (CCVA). The assessment’s purpose of understanding climate change impacts is consistent with a number of federal and state government initiatives and evolving international work programs. The purpose of this document is to provide guidance for PMNM’s response to climate change by providing an in-depth assessment of the likely effects of climate change on the various natural and cultural resources of the Monument. The content of the CCVA was developed through a series of workshops, interviews with PMNM management partners, and a review of the literature. Through this unique process, PMNM not only sought to understand the likely impacts of climate change on Papahānaumokuākea’s resources, but also outlined a research and management agenda in the form of key objectives and targeted strategies for responding to these unprecedented changes. The latter Climate Change Action Plan is in the process of final approval by the Co-

Trustees of PMNM, and will be published as a separate document in the future. For more information, contact Randall.Kosaki@noaa.gov. The report can be downloaded at: <http://sanctuaries.noaa.gov/science/conservation/pmnm-climate-change.html/>

Office of National Marine Sanctuaries
National Oceanic and Atmospheric Administration

MARINE SANCTUARIES CONSERVATION SERIES ONMS-16-03



**Climate Change Vulnerability Assessment
for the Papahānaumokuākea Marine National
Monument**



U.S. Department of Commerce
National Oceanic and Atmospheric Administration
National Ocean Service
Office of National Marine Sanctuaries



<http://www.papahanaumokuakea.gov> June 2016

PMNM Field Team Holds Field Training on Hull Inspections (AS-1.2, 3.2, CO-2.2)

On September 16, PMNM Field Team members conducted field training on aquatic invasive species inspections on several vessels. To protect the unique ecosystems of PMNM, all vessels conducting operations in the Monument need to be inspected for the presence of marine alien species prior to approval of an entry permit. Training was conducted to strengthen the vessel inspection program and build capacity to conduct these inspections in the future. Training consisted of remotely operated vehicle operations, lockout and tagout procedures for vessels, and aquatic invasive species identification. For more information, contact Jason.Leonard@noaa.gov.

PMNM Scientists Co-Author Major Review of Deep Reef Research in Hawai‘i (MCS-3.4; CBO-3.1)

On October 4, the open-access scientific journal PeerJ published a comprehensive 45 page article reviewing mesophotic coral ecosystem research in the Hawaiian Archipelago. This extensive study of Hawaiian deep coral reefs, known as mesophotic coral ecosystems or “the coral reef twilight zone,” spanned over a decade of work. Submersibles, ROVs, drop-cameras, data recorders, multibeam sonar, and technical rebreather diving were among the technologies used to characterize this difficult-to-access habitat. Among the discoveries were levels of endemism approaching 100% in the fish assemblages of PMNM. This is the highest level of endemism recorded from any marine ecosystem on Earth. PMNM Deputy Superintendent Randy Kosaki and Nancy Foster Scholar Cori Kane were among the 16 NOAA-funded authors of the study, which can be downloaded at <https://peerj.com/articles/2475>. For more information, contact Randall.Kosaki@noaa.gov.



PMNM scientist Randy Kosaki conducts a fish survey on a closed-circuit rebreather at 90 m (300 feet) in the Northwestern Hawaiian Islands. (Credit: Richard Pyle/Bishop Museum)

PMNM Staff Participates in Intertidal Monitoring on O‘ahu (CO-2.2, NHCI-3.1, CBO-3)

On October 4, PMNM staff and leadership participated in a field activity surveying the rocky intertidal areas of Oahu’s south shore. The group held protocol and informational briefing, followed by collection of ha‘uke‘uke (helmet urchin) for dissection and measurements. After lunch, the group split up to perform rapid surveys and chain transects to record the species found in the different intertidal zones. This field day is yet another ONMS staff contribution to the ‘Opihi Partnership, which was established in 2009 and is a hugely successful collaboration between Hawaiian practitioners, university scientists and management agencies. The partnership embraces both scientific research and traditional Hawaiian knowledge and supports Hawaiian communities and managers in monitoring Hawaii’s shorelines and effecting positive change for marine resources at the community level. The day also served to expose PMNM staff, many of whom don’t engage in fieldwork as part of their daily functions, to the work being done by partners in the community, and as a means for team building and staff bonding. For more information, contact Athline.Clark@noaa.gov.



Left: Kanoe Morishige (with clipboard) gives the group instructions. (Credit: Toni Parras/NOAA) Right: the group after a day’s hard work. (Credit: NOAA)

Staff Changes

New Hires:

Kalani Quioco, Native Hawaiian Program Specialist

Nicole Evans, Planning and Evaluation Specialist and RAC Coordinator

Tiane McNeil, Administrative Assistant

Departures:

Acacia Diaz, Administrative Assistant

Scott Godwin, Resources Protection Specialist

Allison Ikeda, Policy and Program Specialist

Joey Lecky, GIS Specialist

Nai'a Lewis, Ocean Initiatives Project Manager

Calendar

- December 4, 2000 & January 18, 2001, Executive Orders 8031 & 8112 issued creating the NWHI Coral Reef Ecosystem Reserve
- December 8, 2016 Ad Hoc MMB meeting
- Feb/Mar 2017 Western Pacific Regional Fisheries Management Council public meetings on fishing regulations in the PMNM Expansion area