

**Papahānaumokuākea Marine National Monument  
Agency Report to the Reserve Advisory Council  
January 26, 2016 – April 22, 2016**

**Agency:** NOAA/NOS/ONMS/PMNM  
**Presented by:** Athline Clark, Superintendent  
**Date:** May 12, 2016

**Agency Accomplishments & Recent Activities**

***Agency Coordination***

**PMNM Management Board Holds First Meeting of 2016 (AC-2.2)**

On January 21, Papahānaumokuākea Marine National Monument Management Board held its first scheduled meeting of 2016 at NOAA’s Inouye Regional Center on Ford Island. The MMB received updates on the NOAA NDBC buoy stranded on Neva Shoal, as well as the three unresolved MMB issues pending before the Senior Executive Board (SEB). The Board formally endorsed the Monument’s Climate Change Action Plan (CCAP) and discussed how to integrate the plan with NOAA’s Hawai‘i Sentinel Site program. Other discussion items from the meeting included PMNM agency participation in the upcoming World Conservation Conference, moving towards a consensus decision on the future of Tern Island, and February’s Big Ocean Business Meeting and 10 year PMNM anniversary / 5 year World Heritage inscription celebration. Finally, the Board elected its 2016 officers: Chair Athline Clark (ONMS); Vice-Chair Matt Brown (FWS Refuges); and Recorder Ty Benally (FWS Refuges). For more information, please contact [David.Swatland@noaa.gov](mailto:David.Swatland@noaa.gov).

**PMNM Honors a Decade of Accomplishments (AC-2.2; CBO-1.2, CBO-2.2)**

On February 8, representatives of marine managed areas gathered to honor a decade of accomplishments made by managers and partners of PMNM, which celebrates its 10<sup>th</sup> anniversary this June. The gathering was held in collaboration with Big Ocean, a network of the world’s large-scale marine managed areas, which hosted a 3-day “Think Tank on the Human Dimensions of Large-Scale Marine Protected Areas” in Honolulu. Created at a time when less than one percent of the ocean was protected, PMNM is now one of 16 large-scale marine protected areas around the world, making up more than 3.4 million square miles. The event, held at the Governor’s residence in Honolulu, acknowledged the state and federal agencies, partners and advisory and cultural groups that contribute to successfully integrating traditional and western science approaches to research and management of the Monument. The gathering also recognized elders that contributed their wisdom to PMNM who have now passed. Attendees also bid farewell to ‘Aulani Wilhelm, former PMNM superintendent who has been engaged in shaping the site since its inception, who is moving on from NOAA to the nonprofit sector. Nearly 300 people attended the event. For more information, contact [Athline.Clark@noaa.gov](mailto:Athline.Clark@noaa.gov).



*Left: NOAA Superintendent for PMNM Athline Clark is interviewed by local news crew while guests arrive at the Governor’s residence. Right: Guests applaud PMNM accomplishments. (Credits: Toni Parras/NOAA)*

**Media clips**

- KITV: <http://www.kitv.com/clip/12201303/celebrating-10-years-of-the-papahanaumokuakea-marine-national-monument>
- Big Island Now: <http://bigislandnow.com/2016/02/09/papahanaumokuakea-representatives-gather-in-celebration-of-a-decade/>

## Constituency Building & Outreach

**PMNM Staff Promotes Deep-Water Expedition to the Monument** (CBO-3.1, MCS-3.4, CBO-1.5, OEL-2.2)  
On February 16 and 18, PMNM staff provided on-board tours of NOAA Ship *Okeanos Explorer* for partners and visiting MPA managers (attended by 20 people collectively). On February 17 and 18, PMNM staff presented webinars for educators and students for ONMS and OER webinar series to showcase the exploration tools, education modules and lesson plans available (attended by 20 educators from the U.S., American Samoa and Germany, and 50 educators from the U.S., Guam, Portugal and Brazil, respectively). On February 17 and 19, PMNM staff appeared on Hawai‘i Public Radio’s Bytemarks Café and The Conversation talk shows, respectively, to promote the deep-sea expedition aboard NOAA Ship *Okeanos Explorer* to survey deep-water habitats within and around PMNM. On March 3, crew and scientists aboard the *Okeanos* hosted an “Ask Me Anything” session on the Reddit Science website, an online forum for the general public to ask questions about the expedition. Close to 400 questions were submitted to the online forum, which was viewed by over 4200 unique visitors. And on March 9, PMNM staff facilitated a live broadcast conference call between *Okeanos* scientists and Pwo (master) Navigator Kalepa Baybayana aboard the Polynesian voyaging canoe *Hōkūle‘a* to discuss exploration, the cultural significance of Papahānaumokuākea, and the two different yet similar missions each were conducting. The conversation was broadcast live as part of the virtual stream from the *Okeanos Explorer*, which streamed in real-time at the Mokuapāpapa Discovery Center and the OE Command Center at the NOAA Inouye Regional Center on O‘ahu. For more information, contact [Daniel.Wagner@noaa.gov](mailto:Daniel.Wagner@noaa.gov), [Toni.Parras@noaa.gov](mailto:Toni.Parras@noaa.gov), or [Andy.Collins@noaa.gov](mailto:Andy.Collins@noaa.gov).



*PMNM promotes Okeanos Explorer expedition via live tours, webinars and radio shows. (Credits: NOAA)*

### Learn more

- Bytemarks Café: <http://www.bytemarkscafe.org/category/podcasts/>
- The Conversation: <http://hpr2.org/post/conversation-friday-february-19th-2016#stream/0>
- Reddit Science forum: [https://www.reddit.com/r/science/comments/48rry9/science\\_ama\\_series\\_we\\_are\\_engineers\\_and/](https://www.reddit.com/r/science/comments/48rry9/science_ama_series_we_are_engineers_and/)

**PMNM Presents at IUCN Oceans Conference for Emerging Environmental Leaders** (AC-3.2; CBO-3.3)  
From February 16-18, PMNM Policy and Permits Coordinator Tia Brown participated in the Oceans Conference for Emerging Environmental Leaders in Suva, Fiji. The conference, hosted by the United States Embassy in Fiji in partnership with the International Union for Conservation of Nature (IUCN), provided an opportunity for emerging conservation managers to discuss and address priority ocean management problems facing the region’s youth, explore solutions to overcome those problems in the real world, and partner them with experienced professionals in the field. Tia gave a Keynote Presentation on PMNM titled “Engaging Community & Fostering Stewardship.” Approximately 45 participants (30 youth and 15 facilitators and presenters) attended. For more information, contact [Tia.Brown@noaa.gov](mailto:Tia.Brown@noaa.gov) or see <https://www.iucn.org/about/union/secretariat/offices/oceania/?22469/Our-Oceans-Our-Responsibility-Conference>.

**PMNM Staff and Partners Talk about the ‘Opihi Partnership on Public Radio Show** (CBO-3.1, MCS-1.1, 1.2; NHCH-2.1, 2.2, 2.3, 2.6)

On February 24, PMNM staff and partners appeared on Hawai‘i Public Radio’s Bytemarks Cafe radio show to talk about the ‘Opihi Partnership, an initiative that integrates traditional knowledge with cutting-edge science to better understand ‘opihī populations and collect information that will benefit stewardship efforts and marine

ecosystem health at sites around Hawai'i. Participants included Roxie Sylva from TNC, Chris Bird, Ph.D. from Texas A&M, Corpus Christi, Scott Crawford of Na Mamo o Muole'a, and PMNM Policy and Permits Coordinator Tia Brown. For more information, contact [Tia.Brown@noaa.gov](mailto:Tia.Brown@noaa.gov) or listen to the show at <http://www.bytemarkscafe.org/2016/02/24/episode-391-opihi-partnership-feb-24-2016>.

#### **PMNM Participates in World Wildlife Day at the Honolulu Zoo (CBO-3.1)**

On March 5, PMNM hosted a booth at the Honolulu Zoo's World Wildlife Day event aimed to help raise awareness of wildlife trafficking and invasive species education. The booth consisted of a spin-the-wheel map game to educate people about the Northwestern Hawaiian Islands and photo banners featuring endangered species, which staff encouraged visitors to post on social media. Approximately 70 people visited the booths. For more information, contact [Toni.Parras@noaa.gov](mailto:Toni.Parras@noaa.gov).

### ***Education***

#### **Mokupāpapa Hosts “Moby Dick”-inspired “Dreaming Whales” Reader’s Theater Event (CBO-3.1 & 4.4)**

On January 22, the Mokupāpapa Discovery Center hosted a multi-media reader's theater production called “Dreaming Whales.” The event featured theatrical readings from Herman Melville's novel “Moby Dick,” Nathaniel Philbrick's bestseller “In The Heart of the Sea” and works of Nathaniel Hawthorne, and provided an interactive platform for teaching about whaling history and maritime heritage. The audience participated in the production, hoisting puppets, aiding in the capture of the white whale, and playing musical instruments. Whaling-era props and period decorations were on display, and even foods from the whaling-era were shared – including non-alcoholic cider, chowder stew and hardtack (a type of non-leavened bread). The event was attended 105 by people. For more information, contact [Andy.Collins@noaa.gov](mailto:Andy.Collins@noaa.gov).



*Audience members participate in “Dreaming Whales.” (Credits: Andy Collins/NOAA)*

#### **PMNM Participates in Solomon Elementary Career Fair (CBO-3.1, MCS-3.4)**

On January 23, PMNM staff participated in Solomon Elementary AVID Career Fair. Education Specialist Kainoa Kaulukukui-Narikawa and PVS Apprentice Navigator Lehua Kamalu spoke to students about marine science careers. Approximately 120 students and 21 adults attended. For more information, contact [Kainoa.Kaulukukui@noaa.gov](mailto:Kainoa.Kaulukukui@noaa.gov).

#### **PMNM Holds Video Chat between Midway Researchers and Students (CBO-1.5 & 3.1, OEL 2.2, MCS-3.4)**

On January 28, February 9 and 12, students from Kamehameha Elementary School, Kailua Intermediate and Mililani High School participated in real-time video chats with scientists at Midway Atoll National Wildlife Refuge. Students crafted their own questions to ask researchers after participating in a pre-chat lesson where they learned background information on PMNM and the Laysan Albatross and engaged in a wildlife monitoring activity taking observational data on the developmental stages of albatross chicks. A total of 80 students and six adults participated in the lessons and video chats, which were facilitated by PMNM Education Specialist Kainoa Kaulukukui-Narikawa, FWS Education Specialist Amy Olliffe and FWS Volunteer Barbara Mayer. For more information, contact [Kainoa.Kaulukukui@noaa.gov](mailto:Kainoa.Kaulukukui@noaa.gov).

**PMNM Staff Teaches Series of Lessons at Hau‘ula Elementary School (CBO-2.3, 3.1, 3.2, OEL-1.4, MD-3)**

On nine days between January 15 and February 11, PMNM staff visited Hau‘ula Elementary School to teach a series of lessons about PMNM as part of the Navigating Change Program. Kindergarteners, first and second graders were introduced to PMNM and then completed an art activity. Third graders learned about albatross and marine debris and, in a subsequent lesson, completed a bolus dissection and analysis. Fourth graders learned about the native plants and animals that call PMNM home and how they are affected by invasive species. Fifth and sixth graders, and Hawaiian Immersion students (K-6) learned about the cultural significance of PMNM to Native Hawaiians. Approximately 320 students and 20 adults participated in the lessons, which were coordinated and facilitated by PMNM Education Specialist Kainoa Kaulukukui-Narikawa. PMNM will be scheduling more Navigating Change lessons and field trip experiences with Hau‘ula Elementary School in the months to come. For more information, contact [Kainoa.Kaulukukui@noaa.gov](mailto:Kainoa.Kaulukukui@noaa.gov).



*Left: Hau‘ula Elementary first graders color PMNM reef posters. Right: Hau‘ula Elementary fourth graders create posters about native species in PMNM. (Credit: Kainoa Kaulukukui/NOAA)*

**PMNM Staff Helps Teachers with Place and Culture-Based Curricula Projects (OEL-1.4)**

On February 13, 14 and 15, PMNM attended a STEM curriculum workshop organized by the University of Hawai‘i at Mānoa’s Curriculum Studies Department for the EDCS 433 Interdisciplinary Science Curriculum Professional Development class. The 3-day workshop is the first of a series designed to provide content and strategies that teachers will employ to develop, deliver and assess culturally responsive place and standards-based curricula connected to their communities. PMNM will be meeting with in the EDCS 433 teachers regularly over the next year to help them refine their curricula projects. PMNM Education Specialist Kainoa Kaulukukui-Narikawa worked with the O‘ahu Invasive Species Committee and the Hawai‘i Institute of Marine Biology to help to support these efforts. Approximately 25 teachers and facilitators attended the workshop. For more information, contact [Kainoa.Kaulukukui@noaa.gov](mailto:Kainoa.Kaulukukui@noaa.gov).

**PMNM Participates in Teacher’s Workshop Partnership Forum (CBO-3.1)**

On February 27, PMNM and HIHWNMS staff hosted a resource booth at the first Hawai‘i “Elevating and Celebrating Effective Teaching and Teachers (ECET2)” conference, held at ‘Iolani School’s Sullivan Center for Leadership and Innovation. The ECET2 is a national conference that brings together a community of teacher leaders and aims to empower and connect them professionally as educators. This is the first time ECET2 was held in Hawai‘i; it was organized by a local team of current Hawai‘i Public School teacher leaders from the National Network of State Teachers of the Year (NNSTOY) and Hope Street Group. Approximately 80 people attended. For more information, contact [Kainoa.Kaulukukui@noaa.gov](mailto:Kainoa.Kaulukukui@noaa.gov).

**ONMS PMNM Developing Education & Outreach Strategy (CBO-1.5 & 3.1, OEL 2.2, MCS-3.4)**

On March 3 and 16, ONMS PMNM staff held two workshops in Hilo and Honolulu, respectively, to continue the development of an ONMS PMNM Education and Outreach plan. These workshops were a follow up to the initial workshop held in the fall 2015, during which staff drafted Vision and Mission statements for the plan. During

these follow up workshops, staff reviewed the draft of the plan strategies, identified gaps, and compiled activities to implement the plan. For more information, contact [Andy.Collins@noaa.gov](mailto:Andy.Collins@noaa.gov) or [Alyssa.Miller@noaa.gov](mailto:Alyssa.Miller@noaa.gov).

#### **PMNM Presents Curricula and Resources at Teacher Workshop (CBO-3.1)**

On March 18, PMNM presented at a teacher workshop hosted at NOAA Inouye Regional Center. The workshop sought to introduce teachers to the variety of educational classroom activities and lesson plans made available by NOAA. PMNM staff introduced participants to resources that will aid in the facilitation of lessons that explore critical issues affecting the entire Hawaiian archipelago including coral reef decline, marine debris, invasive species and climate change. PMNM Education Specialist Kainoa Kaulukukui-Narikawa, Pacific Islands Marine Debris Regional Coordinator Mark Manuel and IRC Outreach & Education Coordinator Patty Miller planned and organized the teacher workshop, which was attended by approximately 20 teachers. On March 28, PMNM staff presented at another teacher workshop as part of a four-day professional development course designed by the Mālama Learning Center for teachers interested in learning about marine debris, healthy coastline ecosystems, and overall watershed health. PMNM staff introduced participants to the Navigating Change and Winged Ambassadors curriculums and then lead teachers through a bolus dissection and analysis. PMNM Education Specialist Kainoa Kaulukukui-Narikawa, Pacific Islands Marine Debris Assistant Coordinator Grace Chon and IRC Outreach & Education Coordinator Patty Miller planned and organized the workshop, which was attended by 27 teachers. For more information, contact [Kainoa.Kaulukukui@noaa.gov](mailto:Kainoa.Kaulukukui@noaa.gov).

#### **PMNM Supports Navigating Change Program at Camp Mokule‘ia (OEL-1.1)**

On March 23 and 24, the Navigating Change program at Camp Mokule‘ia hosted 50 sixth grade students, five teachers and six parents from Island Pacific Academy. The Navigating Change overnight camp is designed to be a culminating experience for schools using the Navigating Change Teachers Guide. The program aims 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 cleanup 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](mailto:Kainoa.Kaulukukui@noaa.gov).

#### **PMNM Presents on NWHI and NOAA Careers to Science Fair Participants (CBO-3.1, MCS-3.4)**

On March 29, PMNM Education Coordinator Andy Collins gave a one-hour presentation on PMNM and careers with NOAA to more than 200 students attending the State’s Science Fair. The presentation included videos highlighting careers on NOAA’s research ships and the importance of large-scale marine protection. For more information, contact [Andy.Collins@noaa.gov](mailto:Andy.Collins@noaa.gov).

#### **PMNM Presents on Marine Debris to UH Mānoa Animal Communication Class (CBO-3.1, MD-3)**

On March 31, PMNM staff gave a presentation to 25 students in UH Mānoa’s Animal Communication class on PMNM and marine debris. PMNM Education Coordinator Andy Collins talked about the impacts of marine debris on wildlife and habitats and what NOAA is doing to address the issue. This is the third year PMNM has presented to this class. For more information, contact [Andy.Collins@noaa.gov](mailto:Andy.Collins@noaa.gov).

#### **PMNM Presents to Visiting Olympic Coast High School Class (CBO-3.1)**

On April 6, fifteen high school students from Washington’s Olympic Coast and the Suquamish Tribe visited NOAA’s Inouye Regional Center as part of a B-WET-funded Ecosystem Pen Pals Pacific cultural and natural history exchange program. During their visit, PMNM Education Coordinator Andy Collins gave a presentation on PMNM. Students in the program will be exchanging natural and cultural history stories and experiences with other high school students in American Samoa and Hawai‘i. The idea for the program developed from an earlier collaboration between Olympic Coast Educator Karen Matsumoto and Hawai‘i educators during a PMNM-led experiential education program on Midway Atoll called Papahānaumokuākea Ahahui Alaka‘i. For more information, contact [Andy.Collins@noaa.gov](mailto:Andy.Collins@noaa.gov).



*Olympic Coast Suquamish Tribe students visit NOAA's Inouye Regional Center. (Credit: Andy Collins/NOAA)*

**PMNM Staff Review and Rank B-WET Hawai'i Grant Applications (CBO-3.1, MCS-3.4)**

On April 5 and 6, a diverse group of educators, including PMNM Education Coordinator Andy Collins, reviewed and ranked 23 Hawai'i B-WET grant applications and made recommendations for funding. This year's Hawai'i B-WET funding is a little over a million dollars and applicants could apply for as much as \$150k each. The proposals focused on one or more of the three stated priority areas: providing meaningful watershed experiences for students, educator professional development, and Citizen Science and Community Service Learning programs. The B-WET Hawaii Grant Program is now jointly managed by the Office of Coastal Management and the Pacific Islands Region of the Office of National Marine Sanctuaries. For more information, contact [Andy.Collins@noaa.gov](mailto:Andy.Collins@noaa.gov).

**PMNM Aides Kauai Middle Schools in Building Living Laboratories (CBO-3.1, MCS-3.4)**

Tight schedules make field trips to the ocean a rare occurrence for public schools on the island of Kaua'i, so bringing an aquatic ecosystem to the school is the next best way to get students involved in water chemistry lessons. Therefore, PMNM proposed to aid Kapa'a, Waimea Canyon, and Chiefess Kamakahahei middle schools to setup living laboratories on campus to:

- Study nitrogen and carbon cycles and how it relates to similar processes in the ocean, highlighting how they relate to climate change
- Create an opportunity for hands-on inquiry based STEM lessons
- Learn how water moves through and is purified and/or polluted in a watershed
- Promote sustainable living at home and on campus

The systems are finally up and running and students are regularly testing water samples to track parameters such as nitrites, nitrates, dissolved oxygen, temperature and pH. The discussion in the classroom can then take many paths, among those being how similar processes in the ocean affect climate change as well as reef and watershed health. For more information, contact [Yumi.Yasutake@noaa.gov](mailto:Yumi.Yasutake@noaa.gov).



*Fish, taro and veggies grown in a living lab setup at Kapa'a Middle School. (Credit: Yumi Yasutake/NOAA)*

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

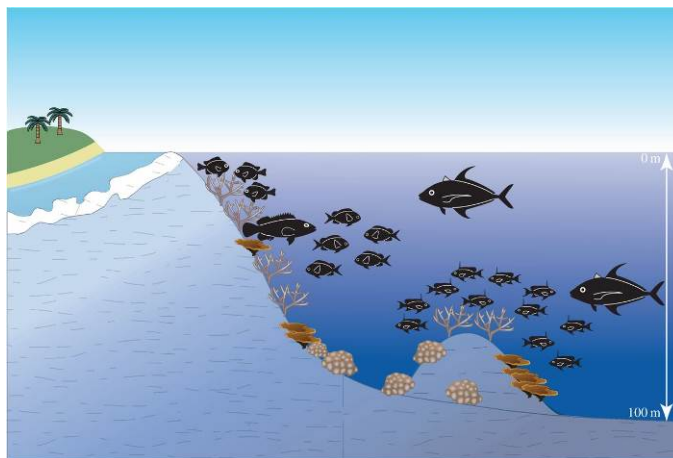
Since January 26, 2016, the MDC has welcomed more than 10,000 visitors. In addition, Discovery Center staff conducted a number of outreach activities, including:

- On January 30, MDC staff participated in the 16<sup>th</sup> annual Ellison Onizuka Science Day at the University of Hawai‘i at Hilo. Students and their parents participated in a fish dissection and gyotaku fish printing activity focused on native reef fishes of Hawai‘i. The event was attended by approximately 600 participants.
- On February 19 and 20, MDC staff participated in community education day events hosted by the Polynesian Voyaging Society (PVS) to celebrate the arrival of the voyaging canoe *Hikianalia* in Hilo. Participants learned about celestial navigation techniques and boarded *Hikianalia* to meet crew members and learn about the Hawaiian practice of Ho‘okele (ocean navigation). The events were attended by an estimated 300 and 500 people, respectively. For more details, visit <http://www.hokulea.com/hikianalia-update-east-hawaii-outreach/>.
- On February 26, MDC hosted a presentation by the Hawai‘i Volcanoes National Park (HAVO) as part of an ongoing partnership with HAVO to celebrate their 100<sup>th</sup> year as a National Park.
- On February 25, MDC hosted the Downtown Improvement Association (DIA) Annual Meeting, attended by 118 small and minority business members including Destination Hilo, which assists with cruise ship travelers, and the County of Hawai‘i Planning, Research and Development office. By partnering with the DIA, MDC continues to foster strong community ties. For more information, contact [Virginia.Branco@noaa.gov](mailto:Virginia.Branco@noaa.gov).
- On March 17, MDC hosted a presentation by PMNM Resource Protection Specialist Scott Godwin, focused on ecosystem threats such as hazardous materials and alien marine species, along with efforts to prevent and mitigate their impacts to PMNM. The presentation was attended by 39 people.

## Research & Field Operations

### PMNM and Nancy Foster Scholars Co-Author Paper on Mesophotic Fishes (MCS-1.3; MCS-1.4, CBO-3.1)

On January 20, the peer-reviewed scientific journal *Proceedings of the Royal Society* published an article that identifies a way to predict which reef fish can live across a greater range of depths, from shallow reefs to the mesophotic or “twilight zone.” An international team of researchers (including Nancy Foster scholars Cori Kane and Richard Coleman, and PMNM Deputy Superintendent Randy Kosaki) found that fishes with deeply forked tails are significantly more likely to be found in both shallow and deep habitats than species with rounded tails. It is suspected that the forked tail allows the fish to swim more silently. The capacity for “stealth swimming” is particularly important in deep habitats, where light irradiance and wave energy are low, and species rely increasingly on sensing subtle changes in water pressure to capture prey and avoid predators. The paper, “Ecological and Morphological Traits Predict Depth-Generalist Fishes on Coral Reefs,” can be accessed online at <http://rspb.royalsocietypublishing.org/content/283/1823/20152332>. For more information, contact [Randall.Kosaki@noaa.gov](mailto:Randall.Kosaki@noaa.gov).



*Schematic diagram of the distribution of functional groups along a depth gradient. Species with high caudal fin aspect ratios (lunate caudal fins) and trailing fin filaments are significantly more likely to occur across a broad depth range than conspecifics with more rounded caudal fins. Adapted from Bridge et al.*

### **PMNM Scientists Join Multiple Collaborators on NSF Grant Proposal (MCS-1.4, AC-3.2)**

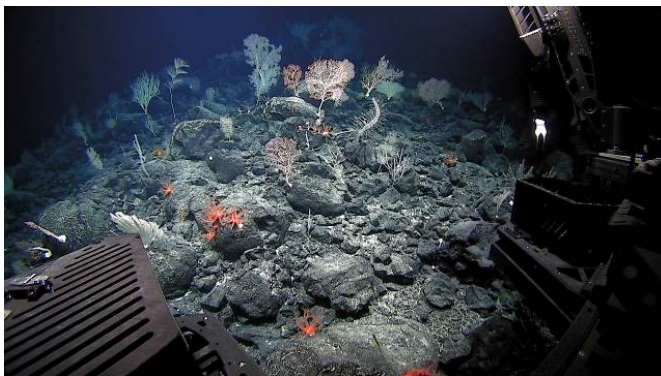
On February 1, PMNM scientists joined collaborators from the University of Hawai‘i and the Bishop Museum to submit a pre-proposal to the National Science Foundation (NSF) for a Long-Term Ecological Research (LTER) grant to study mesophotic coral ecosystems in Hawai‘i. The LTER grants are intended to address ecological questions that cannot be resolved with short-term observations or experiments, and offer up to \$900k/year for up to six years. Unlike most NSF grants, the LTER grants allow participation by federal scientists as co-PIs. For more information, contact [Randall.Kosaki@noaa.gov](mailto:Randall.Kosaki@noaa.gov).

### **Four New Species of Algae Described from Hawaiian Deep-Water Reefs (MCS-1.3; MCS-1.4, CBO-3.1)**

This month, scientists working with PMNM announced the discovery four new species of deep-water algae from Hawai‘i. The new species were sampled during surveys in PMNM by NOAA divers using advanced SCUBA diving technologies, as well during past expeditions throughout the Main Hawaiian Islands using submersibles operated by the Hawai‘i Undersea Research Laboratory. Scientists consulted with the Native Hawaiian community to develop meaningful names for the new species to honor the great importance that algae have in Hawaiian culture. One species was named *Ulva iliohaha*, which refers to the foraging behavior of ‘Īlioholoikauaua, the endangered Hawaiian monk seal, one of the best-known inhabitants of PMNM. The study describing the new species was published in the latest issue of the *Journal of Phycology*. The article, titled “New Ulvaceae (Ulvophyceae, Chlorophyta) from mesophotic ecosystems across the Hawaiian Archipelago,” is featured as the journal’s cover story and can be accessed at <http://onlinelibrary.wiley.com/doi/10.1111/jpy.12375/full>. For more information, contact [Daniel.Wagner@noaa.gov](mailto:Daniel.Wagner@noaa.gov).

### **PMNM Staff Leads Expedition aboard *Okeanos Explorer* to Survey Deep-Sea Areas in PMNM (MCS-1.3; MCS-1.4, CBO-3.1)**

From February 23 to March 18, scientists aboard NOAA Ship *Okeanos Explorer* conducted a 23-day expedition that explored deep-water habitats in and around PMNM. The research expedition used the *Okeanos Explorer*’s two-body remotely operated vehicles (ROV) system to conduct eight dives to depths between 650-4,300 m, which included some of the deepest dives ever conducted in the Hawaiian Archipelago. Scientists made a limited number of specimen collections, including 13 biological samples, all of which represent either new species to science or new records to the region. The team also made use of the ship’s sonar systems to generate high-resolution maps for over 31,000 km<sup>2</sup> of seafloor in the NWHI, including five seamounts that had never been mapped before. The dives were streamed over the Internet in real time, with live video feeds garnering over 125,000 views over the course of the expedition. PMNM Research Specialist Daniel Wagner served as the expedition’s science lead and provided live commentary of the dives. For more information, contact [Daniel.Wagner@noaa.gov](mailto:Daniel.Wagner@noaa.gov) or visit the expedition’s website at <http://oceanexplorer.noaa.gov/okeanos/explorations/ex1603/welcome.html>.



Left: A high-density community of deep-sea corals and sponges at a depth of 2,000 m surveyed during the expedition. Right: The NOAA Ship *Okeanos Explorer*’s two-body ROV system after a successful dive inside PMNM. (Credit: NOAA Office of Ocean Exploration and Research, 2016 Hohonu Moana)



**Former NOAA Hollings Scholar presents PMNM research at the Ocean Sciences Meeting (AC-3.2; (MCS-1.3; MCS-1.4, CBO-3.1)**

On February 26, former NOAA Hollings Scholar Alexandria Barkman presented her research project on mesophotic coral ecosystems in PMNM at the Ocean Sciences Meeting in New Orleans, one of the premier scientific conferences on ocean science. The conference, co-sponsored by the Association for the Sciences of Limnology and Oceanography (ASLO), the Oceanography Society (TOS) and the American Geophysical Union (AGU), promotes scientific exchanges across a broad spectrum of marine science disciplines, as well as science education, outreach and policy. Alexandria presented a poster on the distribution of benthic fauna at mesophotic coral ecosystems of PMNM, a project she completed as part of her NOAA Hollings Scholar internship. Mentored by PMNM scientists Randall Kosaki and Daniel Wagner, Alex completed a ten-week internship at PMNM last summer, during which she conducted her own research with data collected in PMNM. For more information, contact [Daniel.Wagner@noaa.gov](mailto:Daniel.Wagner@noaa.gov).

**PMNM Divers Evaluate Two Models of Rebreathers (CO-2.2, CFO-8.4)**

On February 4, rebreather experts Dr. Rich Pyle (Bishop Museum) and Ray Boland (NMFS PIFSC) provided PMNM divers with technical evaluations of two makes of rebreathers that the NOAA Diving Control and Safety Board will be considering for NOAA use. Pyle is on the design team that produced the Poseidon SE7EN rebreather, and Boland is an instructor on the Inspiration rebreather. Either rebreather would represent a significant step up from the relatively primitive level of electronics in the Megalodon rebreathers currently approved for use by NOAA divers. For more information, contact [Randall.Kosaki@noaa.gov](mailto:Randall.Kosaki@noaa.gov).

**PMNM Participates in the 2016 NOAA Dive Control and Safety Board Annual Meeting (CO-2.2, CFO-8.4)**

From February 26-March 2, PMNM's Field & Research Team participated in the 2016 NOAA Dive Control and Safety Board Annual Meeting in Hawai'i. The board sets the standards for NOAA's diving operations, training and safety. PMNM presented on technical rebreather operations, increasing diving safety and scientific diving in the Monument. Hands-on demonstrations of technical dive gear was also presented and demonstrated to give the group firsthand knowledge of the complexity and safety features of PMNM dive operations. For more information, contact [Jason.Leonard@noaa.gov](mailto:Jason.Leonard@noaa.gov).

**Staff Changes**

New Hires:

Alan Lum, IT Specialist

Liana Murillo, Mokupāpapa Discovery Center Interim Events Coordinator

Departures:

Kālewa Correa, Mokupāpapa Discovery Center Manager

**Calendar**

- Intertidal Monitoring Cruise (12-26 May 2016)
- BioGeo Cruise (22 May-15 June 2016)
- International Coral Reef Symposium (19-24 June 2016)
- Opening of PMNM Exhibit at the Bishop Museum (13 August 2016)
- IUCN World Conservation Congress (1-10 September 2016)