

**Papahānaumokuākea Marine National Monument
Agency Report to the Reserve Advisory Council
May 13, 2016 – July 20, 2016**

Agency: NOAA/NOS/ONMS/PMNM
Presented by: Athline Clark, Superintendent
Date: July 28, 2016

Agency Accomplishments & Recent Activities

Agency Coordination

PMNM Management Board Holds Second Quarterly Meeting of 2016

On April 28, the Papahānaumokuākea Marine National Monument Management Board held its second regular quarterly meeting of 2016 at NOAA’s Inouye Regional Center on Ford Island. The MMB received updates on the Nihoa Millerbird translocation, preparations for the 75th Anniversary Battle of Midway Commemoration, *Okeanos Explorer* expedition, Climate Change Action Plan, and more. Other discussions included PMNM 10 Year Anniversary outreach and participation in the upcoming World Conservation Conference. For more information, please contact David.Swatland@noaa.gov.

PMNM Management Board Hosts DC delegation at NOAA’s IRC

On May 5, the Monument Management Board hosted a delegation of high ranking officials from the White House Council on Environmental Quality, NOAA and DOI at NOAA’s Inouye Regional Center on Ford Island. The group was here on a fact-finding mission to listen to various stakeholder groups about a proposed expansion of PMNM; groups included the MMB, the NWHI CRER Advisory Council, the Western Pacific Regional Fisheries Management Council, and members of the Hawai‘i legislature. For more information, contact Athline.Clark@noaa.gov.



The PMNM Management Board hosts White House officials at NOAA’s IRC. (Credit: Toni Parras/NOAA)

Papahānaumokuākea Celebrates 10 Years and is honored by the Hawai‘i Governor

On June 15, Governor Ige issued a special proclamation to honor the ten-year anniversary of the establishment of the Papahānaumokuākea Marine National Monument. In recognition and celebration of the Monument’s 10th Anniversary, the proclamation declares June 15, 2016 as “Papahānaumokuākea Marine National Monument Day” in Hawai‘i. Staff from the Monument’s seven co-managing agencies were present in the Governor’s office at the State Capitol for the announcement. Also on June 15,

PMNM unveiled a special 10-year anniversary webpage: <http://www.papahānaumokuākea.gov/10year>. For more information, contact David.Swatland@noaa.gov or Toni.Parras@noaa.gov.



Governor Ige's proclamation declaring June 15, 2016 as "Papahānaumokuākea Marine National Monument Day"

PMNM Supports Collaborative Science with Indigenous Knowledge for Climate Change

On July 6-7, PMNM Native Hawaiian Program Specialist Kalani Quiocho attended the Rising Voices 4 workshop on Hawai‘i Island. Nearly 80 people representing 40 indigenous groups and organizations participated. The Rising Voices: Collaborative Science with Indigenous Knowledge for Climate Solutions program facilitates cross-cultural approaches for adaptation solutions to extreme weather and climate events, climate variability and climate change. The program brings social and physical scientists and engineers together with indigenous community leaders from across the country to assess critical community needs and to pursue joint research aimed at developing optimal plans for community action towards sustainability. The workshop sought several outcomes: reflect on principles of effective storytelling and science communication; identify core research ideas for project and program proposals; contribute to the U.S. National Climate Assessment 4 process; and compile recommendations for COP22 (22nd Conference of the Parties to the U.N. Framework Convention on Climate Change) in Morocco in November 2016. The workshop was co-hosted and attended by NOAA Office for Coastal Management. For more information, see <https://risingvoices.ucar.edu/> or contact Kalani.Quiocho@noaa.gov.



Rising Voices 4 participants on Mauna Kea. (Credit: Craig Elevitch/Agroforestry Net, Inc.)

Constituency Building & Outreach

PMNM's Deep-Sea Research Featured on Discovery Channel

On April 28, the Discovery Channel's internationally award-winning science magazine show *Daily Planet* featured a segment on the 2016 expedition to explore deep-sea environments in PMNM aboard NOAA Ship *Okeanos Explorer*. *Daily Planet* is the world's first nightly prime time science show, now in its 21st season and reaching over two million viewers each week. The show highlighted the scientific findings of the 2016 deep-sea expedition to PMNM, including the discovery of several high-density communities of deep-sea corals and sponges, and the documentation of a multitude of species that are new to science or had not been previously known to exist in the region. The show featured an interview with PMNM Research Specialist Daniel Wagner, who served as the science lead for the expedition. For more information, contact Daniel.Wagner@noaa.gov.



Expedition science lead Daniel Wagner monitors a dive in the science control room of the Okeanos Explorer during a ROV dive in PMNM. (image courtesy of NOAA Office of Ocean Exploration and Research, 2015 Hohonu Moana)

PMNM Featured in UNESCO's World Heritage Magazine

Papahānaumokuākea is featured as the cover story in the April issue of UNESCO's World Heritage Magazine "Planet at the Crossroads." The beautiful six-page spread highlights Papahānaumokuākea's outstanding natural and cultural heritage in this year of our 10 year anniversary. The article can be accessed online at <http://whc.unesco.org/en/review/79>. For more information, contact Athline.Clark@noaa.gov.



Cover of the April 2016 World Heritage Magazine featuring Papahānaumokuākea.

PMNM's Deep-Sea Discoveries featured on Local Science Television Show

On June 17, the science television show Likeable Science featured an interview with PMNM Research Specialist Daniel Wagner, who talked about recent research expeditions to characterize the deep-sea resources of the Monument aboard the NOAA ship Okeanos Explorer. Likeable Science is a weekly science show on local television station ThinkTech Hawaii that focuses on contemporary science and technology issues around Hawaii. The show highlighted the many scientific discoveries that were made during recent deep-water surveys of PMNM using remotely operated vehicles, including numerous species that are new to science or that were not previously known to exist in Hawaii. The show can be viewed in its entirety at: <https://www.youtube.com/watch?v=zSy-2s9chY>. For more information, contact Daniel.Wagner@noaa.gov.



Photo Caption: PMNM Research Specialist Daniel Wagner interviewing for the live local television show Likeable Science on ThinkTech Hawaii (image courtesy of ThinkTech Hawaii).

PMNM's 10th Anniversary and Potential Expansion Featured on Local Radio Program

On June 8, PMNM NOAA Deputy Superintendent for Programs & Policy David Swatland, former DLNR Chair and NHCWG member William Aila, and UH biologist Dr. Robert Richmond spoke on the local radio show *All Things Marine*, hosted by Carlie Wiener, Communications Manager for the Schmidt Ocean Institute. The group discussed the significance of the Monument's 10th Anniversary, the logistics and science of expansion, and the importance of the NWHI's natural and cultural resources, as well as the upcoming ICRS event in Honolulu. The radio podcast can be [downloaded here](#), and more information is available at www.cosee-ie.net/programs/allthingsmarineradioshow. For more information, contact david.swatland@noaa.gov.



Photo Caption: UH's Dr. Robert Richmond, PMNM's David Swatland, and William Aila on the set of All Things Marine radio show. (image courtesy of Carlie Wiener).

Education

PMNM Organizes Field Trip for Hau‘ula Hawaiian Language Immersion Students

On March 15 and May 16, PMNM staff supported field trips with Kānehūnāmoku Voyaging Academy for Hau‘ula Elementary School Hawaiian language immersion 4th-6th grade students. During the first field trip students visited an organic farm, which grows various plants that were brought to Hawai‘i by Polynesian voyagers along with a variety of native plants. Students worked in a taro patch, pounded poi and learned how to dry and process food in preparation for canoe voyages. During the second field trip, students visited Kualoa Regional Park for a wa‘a (canoe) experience. Students went aboard Kānehūnāmoku, a 29ft double-hulled sailing canoe, and were given a glimpse into what it's like to be a voyager. The wa‘a experience field trip featured 5 stations, including: a ride on Kānehūnāmoku; a Hawaiian and Micronesian star compass lesson; a knot tying lesson; an update on the Hōkūle‘a Mālama Honua Worldwide Voyage; and a lesson on the history and importance of voyaging in Polynesia. A total of 42 students, 3 teachers, and 8 chaperones participated. PMNM Education Specialist Kainoa Kaulukukui-Narikawa helped plan and organize the field trip as part of PMNM’s Navigating Change program. For more information, contact Kainoa.Kaulukukui@noaa.gov.



Hau‘ula Elementary students enjoy a ride on Kānehūnāmoku. (Credit: Kainoa Kaulukukui-Narikawa/NOAA)

PMNM Supports Navigating Change Program at Camp Mokule‘ia

On May 25 and 26 the Navigating Change program at Camp Mokule‘ia hosted 30 eighth grade students and 4 teachers from Wai‘anae Middle School. The Navigating Change overnight camp is designed to be a culminating experience for schools using the Navigating Change Teachers Guide. Navigating Change 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 sorting exercise; 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; invasive plant removal and native plant out-planting; and various other PMNM-centered educational activities. For more information, contact Kainoa.Kaulukukui@noaa.gov.



Wai'anae Middle School students discuss strategies during a team-building exercise. (Credit: Kainoa Kaulukukui-Narikawa/NOAA)

PMNM Facilitates Wildlife Biologist Lesson at Hawai'i Children's Discovery Center

On June 14, PMNM staff taught about the Laysan Albatross to children participating in a week-long "Mad Science" camp at Hawai'i Children's Discovery Center. PMNM Education Specialist Kainoa Kaulukukui-Narikawa talked about the role of a wildlife biologist and discussed the scientific and cultural importance of PMNM. Students were taught about the habitat, diet and life stages of the Laysan Albatross and then participated in a wildlife monitoring activity where they pretended to be wildlife biologists and recorded observational data on the developmental stages of Laysan Albatross chicks. Students discussed the implications of marine debris and brainstormed ways in which they could help the ocean and the wildlife that depend on it. Twenty-four students ages four to eight year old, and six educators participated in the lesson. For more information, contact Kainoa.Kaulukukui@noaa.gov.



Student pretends to be a wildlife biologist and records observational data on the developmental stages of Laysan Albatross chicks. (Credit: Kainoa Kaulukuku-Narikawa/NOAA)

PMNM Presents at 'Iolani Elementary School

On June 17, PMNM staff took third, fourth and fifth graders at 'Iolani Elementary School on an imaginary expedition to Midway Atoll. The lesson began with an introduction to PMNM and the types of jobs that volunteers and researchers do within the Monument. Students then took on the role of a wildlife biologist and participated in a monitoring activity in which they recorded observational data on the developmental stages of Laysan Albatross chicks. Students also completed a bolus dissection, categorized the contents on their boluses, and recorded data. Students discussed the implications of marine debris wildlife and made pledges to refuse, reduce, reuse and recycle. PMNM Education Specialist Kainoa Kaulukukui-Narikawa and FWS Education Specialist Amy Olliffe facilitated the lesson for 22 students. For more information, contact Kainoa.Kaulukukui@noaa.gov.



‘Iolani Elementary students separate and categorize bolus fragments. (Credit: Kainoa Kaulukuku-Narikawa/NOAA)

PMNM Presents to Punahou Summer School Students

On June 23, PMNM staff presented to three classes of Punahou summer school marine biology students. The presentations gave an overview of the natural and cultural importance of PMNM. Students learned about the Hohonu Moana deep water explorations and watched highlight videos showing some of the interesting species that have been newly discovered by science. Students also learned about the threats to PMNM including climate change, marine debris and invasive species. PMNM Education Specialist Kainoa Kaulukukui-Narikawa presented to a total 65 fourth through eighth grade students, four teachers and 12 educational aids. For more information, contact Kainoa.Kaulukukui@noaa.gov.

PMNM Supports NOAA Hollings Scholars

On June 16, PMNM and HIHWNMS staff participated in the NOAA internship program orientation at the IRC. Approximately 20 interns, including PMNM’s Hollings Scholars Kevin Reagan and Cameron Ogden-Fung, attended. PMNM Communications Manager Toni Parras gave an overview of the Monument to interns and their sponsors. On July 26, Kevin and Cameron presented the results of their work to PMNM staff in a dress rehearsal for the July 28 IRC event that brought all the Hollings Scholars in the building together to present their work. Kevin showcased several education and outreach videos from his presentation *PMNM: Bringing the Place to the People*, and Cameron discussed the results of her research in her presentation *Abundance and Distribution of Benthic Organisms in Mesophotic Coral Ecosystems across the Hawaiian Archipelago*. For more information, contact Toni.Parras@noaa.gov.

Mokupāpapa Discovery Center (MDC) Highlights

The Mokupāpapa Discovery Center continued to have a high number and wide variety of visitors:

- Adults with mixed cognitive and physical abilities with Arc of Hilo participated in weekly visits to MDC for hands-on lessons and marine art projects, focusing on fish adaptation and ti leaf scale printing.
- UH Doran Scholars explored the Center while learning about natural resource management and career options in conservation, research and management.
- Get into your Sanctuary Day was a great success with 238 visitors engaging in family-friendly crafts, films, microscope lab, and Google cardboard virtual reality viewers. MDC also honored its Pacific Island Region sanctuary partners National Marine Sanctuary of American Samoa and the Hawaiian Islands Humpback Whales National Marine Sanctuary with banners and activities.
- Almost 50 students grades six to eight from Halua Kupukupu Innovations Academy explored the Center, learning about pH, the importance of oceans for carbon sequestration, and the potential impacts of acidification to coral reef ecosystems.

- Science Camps of America continued their yearly visit to MDC, exploring the role of squid as prey for many animals in the NWHI (and many ocean food webs), as well as adaptations and anatomy that make them successful predators.



A young visitor takes a virtual dive in the National Marine Sanctuaries during the Get Into Your Sanctuary Day event at Mokuāpapa Discovery Center. Photo: Andy Collins/NOAA Office of National Marine Sanctuaries. (Credit: Justin Umholtz/NOAA-MDC)

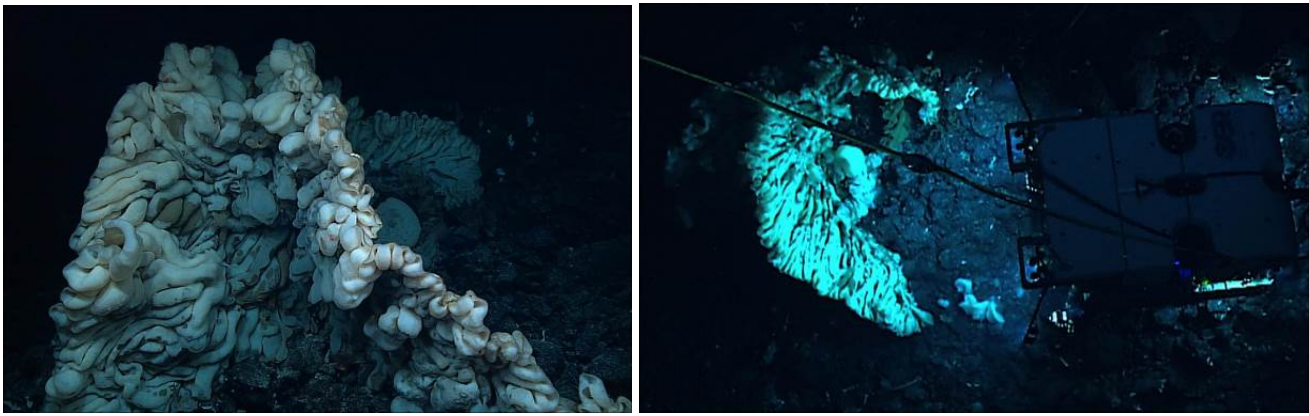
Research & Field Operations

PMNM Describes Largest Known Sponge in the World Discovered in PMNM

On May 24, the peer-reviewed scientific journal *Marine Biodiversity* published an article describing the largest known sponge in the world, discovered during an expedition last summer to explore some of the deepest areas of PMNM aboard the NOAA ship *Okeanos Explorer*. The massive sponge was captured on high-definition video at a depth of 7,000 feet during a remotely operated vehicle dive inside PMNM. The sponge was close to 12 feet long and 7 feet wide, comparable in size to a minivan. It is the largest sponge known to date. The article, titled “The largest sponge in the world?” was authored by PMNM Research Specialist Daniel Wagner and Chris Kelley from the University of Hawai‘i, and can be accessed online at <http://link.springer.com/article/10.1007/s12526-016-0508-z>. For more information, contact Daniel.Wagner@noaa.gov or visit <http://www.noaa.gov/scientists-discover-largest-sponge-known-during-deep-sea-exploration>.

Media Clips

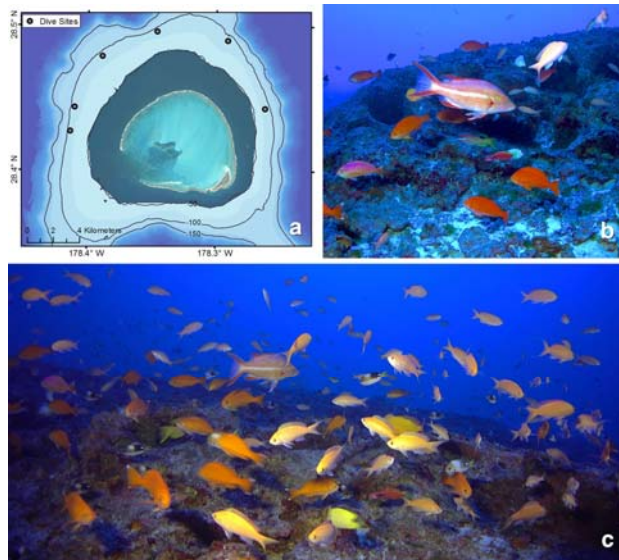
- 1) [KGMB](#)
- 2) [KHON](#)
- 3) [KITV](#)
- 4) [Washington Post](#)



Massive sponge photographed at a depth of 7,000 feet inside PMNM by the remotely operated vehicle (left) *Deep Discoverer* and (right) *Seirios* is largest known sponge in the world. (Images courtesy of NOAA Office of Ocean Exploration and Research, 2015 Hohonu Moana)

PMNM Scientists Document 100% Endemism in Fish Communities at Kure Atoll

On May 26, the scientific journal *Marine Biodiversity* published an article describing the highest level of endemism known from any marine ecosystem on Earth. Using closed-circuit rebreathers and trimix gas mixes to access depths of over 300 feet, PMNM scientists documented this unparalleled level of endemism on a research cruise to the NWHI last September aboard NOAA ship *Hi'ialakai*. The article entitled “100% Endemism in Mesophotic Fish Assemblages of Kure Atoll, Hawaiian Islands,” was authored by PMNM scientists Randy Kosaki, Jason Leonard, Brian Hauk, and Daniel Wagner, and Bishop Museum scientists Richard Pyle and Robert Whitton. The article can be accessed online at <http://link.springer.com/article/10.1007/s12526-016-0510-5?view=classic>. For more information, contact Randall.Kosaki@noaa.gov.

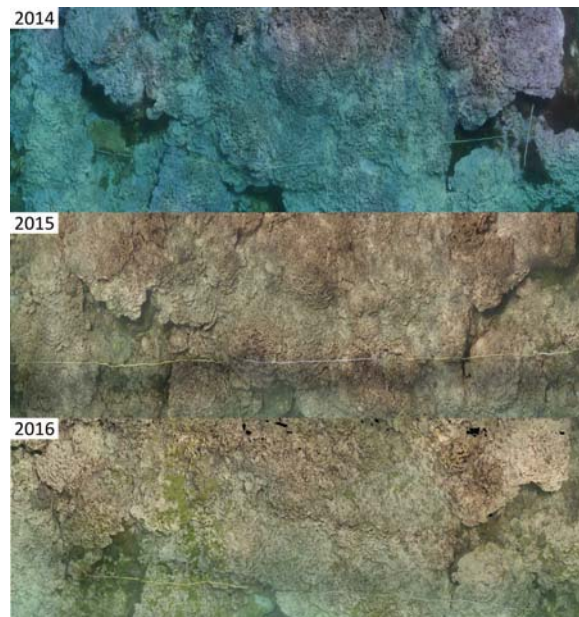


(a) Location of mesophotic fish survey sites around Kure Atoll; (b, c) 100 % endemic reef fish assemblage at 90 m, including *Pseudanthias thompsoni*, *Odontanthias fuscipinnis*, *Caprodon unicolor*, *Chromis struhsakeri*, *Genicanthus personatus*, *Chaetodon miliaris*, *Bodianus albotaeiniatus*, *B. bathycapros*, and *B. sanguineus*. (Credit: NOAA)

PMNM Scientists Discover New Species and Document Coral Mortality

On June 15, NOAA Ship *Hi'ialakai* returned from a 25-day cruise to the NWHI. PMNM and Bishop Museum scientists conducted rebreather surveys of fish assemblages at up to 100 meters (330 feet) depth. Two new species of fish were collected: an undescribed wrasse (genus *Suezichthys*) and an undescribed anthias basslet (genus *Tosanoides*). A third new species (genus *Emmelichthys*) was

photographed, but eluded capture. Additionally, scientists from the Hawai‘i Institute of Marine Biology conducted follow-up surveys to document the aftermath of a 2014 mass coral bleaching event at Lisianski Island. In 2015, up to 90% coral mortality was recorded on shallow reefs. This year, the dead coral was overgrown by invasive green algae (*Boodlea* sp.). It remains to be seen whether this represents a permanently degraded condition, or whether it is an intermediate successional step leading to eventual recovery of the reef. For more information, contact Randall.Kosaki@noaa.gov.



*Permanent coral transect at Lisianski Island. 2014: healthy (purple) and bleached (pale) coral, *Montipora dilatata*. 2015: near 100% coral mortality. 2016: invasive algae beginning to overgrow dead coral (Credit: John Burns/HIMB)*



*A new species of anthias basslet (genus *Tosanoides*) at 330 feet, Kure Atoll (male on the left; female on the right). (Credit: Richard Pyle/Bishop Museum)*

PMNM Staff Attend the International Coral Reef Symposium

From June 19-24, PMNM scientists and staff participated in the 14th International Coral Reef Symposium in Honolulu, attended by over 2,500 coral reef scientists and managers from around the world. PMNM staff members were co-authors on over 15 contributed papers and posters highlighting the research and management taking place in the Monument. PMNM hosted an ONMS Booth and a PMNM Booth during the week-long conference, both of which provided information on ONMS sites, showcased 360-degree imagery of select sites using Google Cardboard, exhibited PMNM’s 10-Year Anniversary Video “Partnering for Protection” and offered a unique “Build a Coral Reef” activity in

which attendees created their own clay sea creatures and added them to a growing coral reef. For more information, contact Toni.Parras@noaa.gov or Randall.Kosaki@noaa.gov.



Left: 2016 International Coral Reef Symposium attendees add their creations to the PMNM 'Build a Reef' exhibit. (Credit: Toni Parras/NOAA) Right: The final reef creation with contributions from attendees from around the world. (Credit: Kainoa Kaulukukui/NOAA)

PMNM Scientists Describe Mesophotic Fish Assemblage Structure in the NWHI

On July 6, the scientific journal PLOS ONE published an article describing mesophotic fish assemblages in the NWHI. Using open-circuit trimix diving, PMNM scientists recorded fish densities on mesophotic reefs at 27-67 m depths in the NWHI. The article combines the mesophotic surveys with shallow-water data collected on the annual Reef Assessment and Monitoring Program (RAMP) cruises, and examines changes in the structure of reef fish assemblages along a depth gradient from 1 to 67 m. The study shows that mesophotic reefs in the NWHI support unique assemblages of fish that are characterized by high endemism and relatively high densities of small bodied planktivores. The article can be accessed online at <http://journals.plos.org/plosone/article?id=10.1371%2Fjournal.pone.0157861>. For more information, contact Atsuko.Fukunaga@noaa.gov.

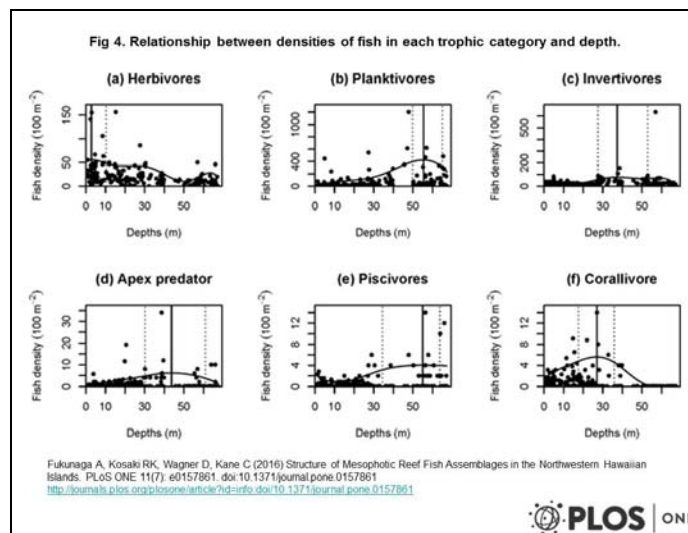


Figure 4 in the article shows relationships between densities of fish in each trophic category and depth. (Credit: Fukunaga et al/NOAA)

Staff Changes

New Hires:

Lucy Kaneshiro, Administrative Assistant

Departures:

Stephanie Fisher, Program Specialist

Nākoa Goo, Mokuāpapa Discovery Center Program Coordinator

Daniel Wagner, Research Specialist

Calendar

- PMNM Expansion Public Meetings
 - O‘ahu, Filipino Cultural Center (1 August 2016)
 - Kaua‘i, Kaua‘i Community College (2 August 2016)
- Monument Management Board meeting (04 August 2016)
- Opening of PMNM Exhibit at the Bishop Museum (13 August 2016)
- IUCN World Conservation Congress (1-10 September 2016)