

State of Hawaii
DEPARTMENT OF LAND AND NATURAL RESOURCES
Division of Aquatic Resources
Honolulu, Hawaii 96813

June 27, 2014

Board of Land
and Natural Resources
Honolulu, Hawaii

Request for Authorization and Approval to Issue a Papahānaumokuākea Marine National Monument Research Permit to Dr. Megan Donahue, Hawai'i Institute of Marine Biology, University of Hawai'i, for Access to State Waters to Conduct Bioerosion Study Activities

The Division of Aquatic Resources (DAR) hereby submits a request for your authorization and approval for issuance of a Papahānaumokuākea Marine National Monument research permit to applicants Dr. Megan Donahue, Associate Professor, Hawai'i Institute of Marine Biology, University of Hawai'i, pursuant to § 187A-6, Hawaii Revised Statutes (HRS), chapter 13-60.5, Hawaii Administrative Rules (HAR), and all other applicable laws and regulations.

The research permit, as described below, would allow entry and management activities to occur in Papahānaumokuākea Marine National Monument (Monument), including the NWHI State Marine Refuge and the waters (0-3 nautical miles) surrounding the following site:

- Nihoa Island
- Necker Island (Mokumanamana)
- French Frigate Shoals
- Gardner Pinnacles
- Maro Reef
- Laysan Island
- Lisianski Island, Neva Shoal
- Pearl and Hermes Atoll
- Kure Atoll State Wildlife Sanctuary

The activities covered under this permit would occur between August 1, 2014 and July 31, 2015.

The proposed activities are largely a continuation of work previously permitted and conducted in the Monument.

INTENDED ACTIVITIES

The applicant would evaluate bioerosion rates and bioeroder community composition (i.e. hydrozoans, bryozoans, barnacles, and tiny mollusks) at up to twenty-nine (29) different reef sites in the Monument. Bioerosion rates would be characterized and compared between the Main Hawaiian Islands and Northwestern Hawaiian Islands, including bioeroder community structure

and indicators of community response to ocean acidification. The methods developed from these activities would help managers anticipate the likely effects of ocean acidification on bioeroder communities and bioerosion rates.

Up to six (6) individuals would be authorized to enter the Monument and conduct activities. Proposed activities would initiate from the R/V HI'IALAKAI (separately permitted under PMNM-2014-005) from August 7 – 31, 2014 at French Frigate Shoals, Lisianski Island, Pearl and Hermes Atoll, and Midway Atoll. The proposed activities include: (1) retrieving ten (10) bioerosion blocks deployed in 2011 at Midway Atoll, and (2) measuring the variation in bioeroder community composition by collecting twenty (20) small pieces (5 by 5 by 5 cm) of dead coral skeleton (*Porites* spp.) at each of twenty-nine (29) sites (total of up to 580 small pieces of dead coral skeleton). All forereef sites are co-located with NOAA-CRED permanent sites. All island locations also include forereef and lagoon sampling sites. The sampling of small pieces of dead coral skeleton would take about two to three days each island location. Bioerosion rates would be assessed using a combination of taxonomic and molecular techniques in collaboration with the Bishop Museum and Dr. Rob Toonen's laboratory.

The activities proposed by the applicants directly support the Monument Management Plan's priority management need 3.1 – Understanding and Interpreting the NWHI, 3.1.1 – Marine Science Action Plan, Activity MCS-1.2: Continuing monitoring of shallow-water coral reef ecosystems to protect ecological integrity (PMNM MMP Vol. 1, p. 123, 2008). This Activity emphasizes the importance of conducting quantitative surveys in shallow-water coral reef ecosystems to better define resource baselines for comparisons in protection and management efforts.

The activities described above may require the following regulated activities to occur in State waters:

- Removing, moving, taking, harvesting, possessing, injuring, disturbing, or damaging any living or nonliving Monument resource
- Touching coral, living or dead
- Swimming, snorkeling, or closed or open circuit SCUBA diving within any Special Preservation Area or Midway Atoll Special Management Area

REVIEW PROCESS

The permit application was sent out for review and comment to the following scientific and cultural entities: Hawaii Division of Aquatic Resources, Hawaii Division of Forestry and Wildlife, Papahānaumokuākea Marine National Monument (NOAA/NOS), NOAA Pacific Islands Regional Office (NOAA-PIRO), United States Fish and Wildlife Service Hawaiian and Pacific Islands National Wildlife Refuge Complex Office, and the Office of Hawaiian Affairs (OHA). In addition, the permit application has been posted on the Monument Web site since March 17, 2014, giving the public an opportunity to comment. The application was posted within 40 days of its receipt, in accordance with the Monument's Public Notification Policy.

Comments received from the scientific community are summarized as follows:

Scientific reviews support the acceptance of this application.

The following questions were raised:

- 1. It would be nice to hear how in the report to managers how this study informs TNC's reef resilience recommendations – are there any new management recommendations in light of this research?**

The applicant states that TNC's reef resilience toolkit states that ecological, biological and physical factors are used to assess coral reef resilience. Specifically, it aims to "maintain reef function and help reef communities, when intact, persist in the face of change and disturbance". Sustaining an intact bioeroder community is key in maintaining healthy coral reef function. Bioerosion rates and coral growth rates, together, control the net growth of coral reefs and provide the complex reef structure that is necessary habitat for many organisms. Both coral growth rates and reef bioerosion rates are expected to be affected by climate stressors; thus, it is important to monitor both processes over time to manage for reef resilience. In a previous study, we showed that bioerosion rates are highest in areas of the reef with the lowest mean pH (Silbiger et al. in revision); suggesting that as ocean pH declines, bioerosion rates will increase. Bioerosion rates should be monitored over time to see if they in fact do change with climate stress. In 2011-2013 the applicant deployed bioerosion blocks at sites throughout the Hawaiian Archipelago to 1) collect baseline data on bioerosion rates in Hawai'i and 2) correlate bioerosion rates with CRED collected environmental data. These data are currently being analyzed and the applicant will put our findings in the report to managers. Before the current study, bioerosion rates were not monitored in PMNM. The applicant recommends adding bioerosion blocks to permanent field sites to monitor bioerosion rates over time.

- 2. What differences, if any, do you expect to find between Papahānaumokuākea and the Southeastern main Hawaiian Islands?**

The applicant states that in 2012 and 2013, they collected rubble from select sites in KUR, LIS, PHR, FFS, O'ahu and Maui in order to taxonomically identify and sequence some of the most abundant bioeroders in the community. From this preliminary study, the applicant saw dramatic differences in the bioeroder communities between Papahānaumokuākea and the Main Hawaiian Islands. Specifically, we saw a much higher abundance of burrowing bivalves and sipunculans on O'ahu and Maui than in the atolls in PMNM. The method we used in 2012 was designed specifically to extract infaunal organisms with minimal tissue damage to the organisms (necessary for taxonomic ID). While our method was successful at extracting some key bioeroders, it is biased towards collecting larger organisms that we can successfully extract and identify. It also gave us a conservative estimate of organism counts. The collections planned under this permit will be used to analyze communities with a molecular method that we are developing with Dr. Rob Toonen's lab. This mass sequencing approach will capture a much more complete sample of metazoans living within and on the dead coral skeleton.

Based on their initial findings, they expect to see large differences in the community between the MHI and NWHI.

3. What do you expect to learn from the results? And how can this directly contribute to management of Papahānaumokuākea and enhance the cultural/spiritual resources of the area?

The applicant expects to learn how the bioeroder community composition differs across the Hawaiian archipelago and see how the community composition correlates with previously collected bioerosion rates and environmental data. Bioeroder communities are often used as indicators of change: many studies have found higher bioeroder abundances in areas with high human impact relative to low impact sites (reviewed in Le Grand and Fabricius 2011). Now, bioeroders may be indicative of climate stress. Research from our lab (Silbiger et al. in revision, Silbiger and Donahue in prep) and others (e.g. Tribollet et al. 2006, Wisshak et al 2012) have shown that bioerosion rates increase with increasing ocean acidity both in the lab and in the field. Having a baseline dataset for bioeroder communities in PMNM (currently, there is no baseline data on this community) will allow managers to track the bioeroder community through time, using the molecular tools developed by the Toonen lab. Managers can use bioeroder community composition as an indicator of environmental stress.

The applicant further explains that coral reefs are the foundational coastal marine ecosystem in PMNM, and these reefs are home to many cultural and spiritual resources of the area. Bioerosion is the natural breakdown of the coral reef framework by living organisms, producing sand and creating habitat for cryptic organisms. Both the rate at which corals grow and the rate at which they are eroded control the overall growth of the reef. If erosion becomes excessive, the mechanical stability of reefs will weaken, increasing breakage during storm events, and the reef structure will become less complex. The complex reef structure can absorb up to 90% wave energy– which protect the islands from wind driven waves – and provides habitat for many reef fish and invertebrates. Thus, it is important to know the baseline bioeroding communities and bioerosion rates and also monitor how bioerosion may change in the future.

Comments:

- 1. If the research objectives can be accomplished, in those situations where it is possible NMFS suggest that the applicant collect dead coral samples that have already been broken off instead of collecting samples from intact coral colonies in order to minimize the contact with live coral colonies.**

The applicant states, thank you for the suggestion. As they have in the past, they will continue to ensure that no live coral colonies are taken or broken during our collections.

Comments received from the Native Hawaiian community are summarized as follows:

Cultural reviews support the acceptance of this application. No concerns were raised.

Comments received from the public are summarized as follows:

No comments were received from the public on this application.

Additional reviews and permit history:

Are there other relevant/necessary permits or environmental reviews that have or will be issued with regard to this project? (e.g., MMPA, ESA, EA) Yes No

If so, please list or explain:

- The proposed activities are in compliance with the National Environmental Policy Act.
- The proposed activities are in compliance with the National Historic Preservation Act.
- The National Marine Fisheries Service (NMFS) provided a letter of concurrence dated June 6, 2014 in regards to a Section 7 informal consultation pursuant to the Endangered Species Act of 1973 is which analyzed the effects of conducting the proposed activities on protected species and monk seal within designated critical habitat See Attachment (Letter to David Swatland from Michael Tosatto dated June 6, 2014).
- The Department has made an exemption determination for this permit in accordance chapter 343, HRS, and Chapter 11-200, HAR. See Attachment (“DECLARATION OF EXEMPTION FROM THE PREPARATION OF AN ENVIRONMENTAL ASSESSMENT UNDER THE AUTHORITY OF CHAPTER 343, HRS AND CHAPTER 11-200 HAR, FOR PAPAĀNAUMOKUĀKEA MARINE NATIONAL MONUMENT RESEARCH PERMIT TO DR. MEGAN DONAHUE, HAWAII INSTITUTE OF MARINE BIOLOGY, UNIVERSITY OF HAWAII, FOR ACCESS TO STATE WATERS TO CONDUCT BIOEROSION STUDY ACTIVITIES UNDER PERMIT PMNM-2014-024”

Has Applicant been granted a permit from the State in the past? Yes No

If so, please summarize past permits:

- The applicant was granted permits for similar activities in 2011 and 2012, PMNM-2011-032 and PMNM-2012-033, respectively.

Have there been any a) violations: Yes No

b) Late/incomplete post-activity reports: Yes No

Are there any other relevant concerns from previous permits? Yes No

STAFF OPINION

DAR staff is of the opinion that the applicants have properly demonstrated valid justification for their application and should be allowed to enter the NWHI State waters and conduct the activities therein as specified in the application with certain special instructions and conditions, which are in addition to the Papahānaumokuākea Marine National Monument Research Permit General Conditions. All suggested special conditions have been vetted through the legal counsel of the Co-Trustee agencies (see Recommendation section).

MONUMENT MANAGEMENT BOARD OPINION

The MMB is of the opinion that the applicants have met the findings of Presidential Proclamation 8031 and this activity may be conducted subject to completion of all compliance requirements. The MMB concurs with the special conditions recommended by DAR staff.

RECOMMENDATION:

That the Board authorize and approve a Research Permit to Dr. Megan Donahue, Hawai'i Institute of Marine Biology, University of Hawai'i, with the following special conditions:

1. This permit is not to be used for nor does it authorize the sale of collected organisms. Under this permit, the authorized activities must be for noncommercial purposes not involving the use or sale of any organism, by-products, or materials collected within the Monument for obtaining patent or intellectual property rights.
2. The permittee may not convey, transfer, or distribute, in any fashion (including, but not limited to, selling, trading, giving, or loaning) any coral, live rock, or organism collected under this permit without the express written permission of the Co-Trustees.
3. To prevent introduction of disease or the unintended transport of live organisms, the permittee must comply with the disease and transport protocols attached to this permit.
4. Tenders and small vessels must be equipped with engines that meet EPA emissions requirements.
5. Refueling of tenders and all small vessels must be done at the support ships and outside the confines of lagoons or near-shore waters in the State NWHI Marine Refuge.

Respectfully submitted,



Frazer McGilvray
Administrator

APPROVED FOR SUBMITTAL



WILLIAM J. AILA JR.
Chairperson

Papahānaumokuākea Marine National Monument
RESEARCH Permit Application

NOTE: *This Permit Application (and associated Instructions) are to propose activities to be conducted in the Papahānaumokuākea Marine National Monument. The Co-Trustees are required to determine that issuing the requested permit is compatible with the findings of Presidential Proclamation 8031. Within this Application, provide all information that you believe will assist the Co-Trustees in determining how your proposed activities are compatible with the conservation and management of the natural, historic, and cultural resources of the Papahānaumokuākea Marine National Monument (Monument).*

ADDITIONAL IMPORTANT INFORMATION:

- Any or all of the information within this application may be posted to the Monument website informing the public on projects proposed to occur in the Monument.
- In addition to the permit application, the Applicant must either download the Monument Compliance Information Sheet from the Monument website OR request a hard copy from the Monument Permit Coordinator (contact information below). The Monument Compliance Information Sheet must be submitted to the Monument Permit Coordinator after initial application consultation.
- Issuance of a Monument permit is dependent upon the completion and review of the application and Compliance Information Sheet.

INCOMPLETE APPLICATIONS WILL NOT BE CONSIDERED

Send Permit Applications to:

Papahānaumokuākea Marine National Monument Permit Coordinator

6600 Kalaniana'ole Hwy. # 300

Honolulu, HI 96825

nwhipermit@noaa.gov

PHONE: (808) 397-2660 FAX: (808) 397-2662

SUBMITTAL VIA ELECTRONIC MAIL IS PREFERRED BUT NOT REQUIRED. FOR ADDITIONAL SUBMITTAL INSTRUCTIONS, SEE THE LAST PAGE.

Papahānaumokuākea Marine National Monument Permit Application Cover Sheet

This Permit Application Cover Sheet is intended to provide summary information and status to the public on permit applications for activities proposed to be conducted in the Papahānaumokuākea Marine National Monument. While a permit application has been received, it has not been fully reviewed nor approved by the Monument Management Board to date. The Monument permit process also ensures that all environmental reviews are conducted prior to the issuance of a Monument permit.

Summary Information

Applicant Name: Megan Donahue

Affiliation: Hawai'i Institute of Marine Biology

Permit Category: Research

Proposed Activity Dates: 06/01/14-11/15/14

Proposed Method of Entry (Vessel/Plane): R/V Hiialakai

Proposed Locations: Shallow water reef (<100 ft depth) focused on bioeroder communities in forereef and lagoon habitats. Specific locations for the study will depend on cruise logistics but will include forereef sites at FFS, LIS, PHR, and KUR and lagoon sites at MID.

Estimated number of individuals (including Applicant) to be covered under this permit:

6

Estimated number of days in the Monument: 50

Description of proposed activities: (complete these sentences):

a.) The proposed activity would...

measure bioerosion rates and bioeroder community composition on reefs in the NWHI. We will characterize differences in bioeroder communities between the MHI and NWHI, compare bioerosion rates throughout the archipelago, identify environmental drivers of bioerosion rates and bioeroder community structure, and evaluate whether internal bioeroders can serve as indicators of community response to ocean acidification on coral reefs.

b.) To accomplish this activity we would

(i) retrieve 10 bioerosion blocks remaining at MID (see explanation below).

(ii) measure variation in bioeroder community composition by collecting thirty small pieces (5x5x5cm) of dead coral skeleton at each of 21 sites (FFS, LIS, PHR, KUR, MID). These pieces of reef substrate will be sampled for bioeroding fauna using mass sequencing in collaboration with the Toonen lab.

Explanation: Bioerosion rates are measured using microCT scans of coral blocks to get a 3D image of the eroded material; this method gives a better estimate of bioerosion rate than the

traditional buoyant weight technique and allows characterization of distinct bioeroder groups. In July 2011, we deployed five calcium carbonate blocks at each of 15 forereef sites (5 sites each at FFS, LIS, PHR) and 20 blocks in a lagoon site at MID. In July 2012, we retrieved all the blocks from FFS, LIS, and PHR, and 10 of the blocks at MID, and deployed blocks at 5 sites on KUR. In July 2013, the KUR blocks were retrieved. For our 2014 permit, we plan to retrieve the final 10 blocks from MID.

c.) This activity would help the Monument by ...
evaluating whether internal bioeroders can serve as indicators of community response to ocean acidification on coral reefs. The community structure and function of bioeroding organisms may have a major effect on coral reef resilience: the sponges, polychaete worms, and tiny mollusks that comprise bioeroder communities control the strength and complexity of the coral reef framework, which is the habitat for more charismatic coral reef organisms. Shifts in the composition and functioning of these out-of-sight, but fundamental members of coral reef ecosystems may change the accretion-erosion balance of coral reefs. The methods developed here will help managers anticipate the likely effects of ocean acidification on bioeroder communities and bioerosion rates.

Other information or background: All forereef sites are co-located with NOAA-CRED permanent sites. This minimizes the impact to the reefs and facilitates sharing of information

Section A - Applicant Information

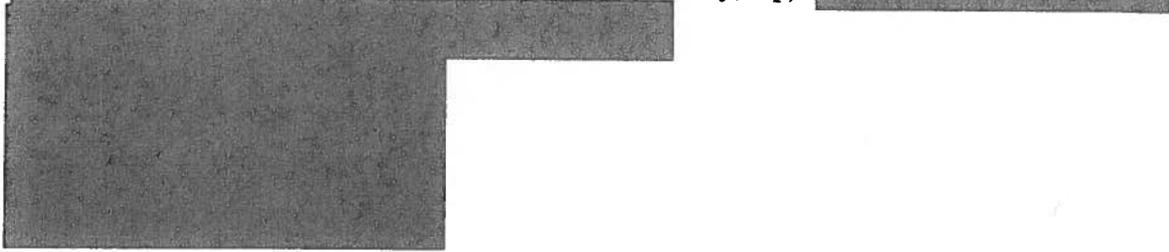
1. Applicant

Name (last, first, middle initial): Donahue, Megan J.

Title: Associate Researcher, Hawai'i Institute of Marine Biology

1a. Intended field Principal Investigator (See instructions for more information):
Nyssa Silbiger, graduate student

2. Mailing address (street/P.O. box, city, state, country, zip):



For students, major professor's name, telephone and email address:

3. Affiliation (institution/agency/organization directly related to the proposed project):
Hawaii Institute of Marine Biology (HIMB), University of Hawaii at Manoa

4. Additional persons to be covered by permit. List all personnel roles and names (if known at time of application) here (e.g. John Doe, Research Diver; Jane Doe, Field Technician):

- Megan Donahue, Applicant, research diver
- Nyssa Silbiger, Field PI, research diver
- Chelsie Counsell, research diver
- Scott Godwin, research diver
- Holly Bolick, research diver
- Un-named Individual, research diver

Section B: Project Information

5a. Project location(s):

<input checked="" type="checkbox"/> Nihoa Island	<input type="checkbox"/> Land-based	<input checked="" type="checkbox"/> Shallow water	<input type="checkbox"/> Deep water
<input checked="" type="checkbox"/> Necker Island (Mokumanamana)	<input type="checkbox"/> Land-based	<input checked="" type="checkbox"/> Shallow water	<input type="checkbox"/> Deep water
<input checked="" type="checkbox"/> French Frigate Shoals	<input type="checkbox"/> Land-based	<input checked="" type="checkbox"/> Shallow water	<input type="checkbox"/> Deep water
<input type="checkbox"/> Gardner Pinnacles	<input type="checkbox"/> Land-based	<input checked="" type="checkbox"/> Shallow water	<input type="checkbox"/> Deep water
<input checked="" type="checkbox"/> Maro Reef			
<input checked="" type="checkbox"/> Laysan Island	<input type="checkbox"/> Land-based	<input checked="" type="checkbox"/> Shallow water	<input type="checkbox"/> Deep water
<input checked="" type="checkbox"/> Lisianski Island, Neva Shoal	<input type="checkbox"/> Land-based	<input checked="" type="checkbox"/> Shallow water	<input type="checkbox"/> Deep water
<input checked="" type="checkbox"/> Pearl and Hermes Atoll	<input type="checkbox"/> Land-based	<input checked="" type="checkbox"/> Shallow water	<input type="checkbox"/> Deep water
<input checked="" type="checkbox"/> Midway Atoll	<input type="checkbox"/> Land-based	<input checked="" type="checkbox"/> Shallow water	<input type="checkbox"/> Deep water
<input checked="" type="checkbox"/> Kure Atoll	<input type="checkbox"/> Land-based	<input checked="" type="checkbox"/> Shallow water	<input type="checkbox"/> Deep water
<input type="checkbox"/> Other			

NOTE: There is a fee schedule for people visiting Midway Atoll National Wildlife Refuge via vessel and aircraft.

Location Description:

Specific locations for the study will depend on cruise logistics, but out target sites are:

Island/Atoll	Site Name	Latitude	Longitude
French Frigate Shoals	FFS -34	23.62792	-166.13538
French Frigate Shoals	FFS -12	23.63835	-166.18005
French Frigate Shoals	FFS-H6	23.88046	-166.27306
French Frigate Shoals	FFS-21	23.84695	-166.32695
French Frigate Shoals	FFS-33	23.83651	-166.26669
Midway Atoll	MID-H11A	28.217667	-177.403217
Midway Atoll	MID-H11B	28.2175	-177.40305
Pearl and Hermes Atoll	PHR-39	27.94045941	-175.8613056
Pearl and Hermes Atoll	PHR-44	27.91026	-175.90483
Pearl and Hermes Atoll	PHR-42	27.75312882	-175.9489414
Pearl and Hermes Atoll	PHR-R26	27.78583	-175.78028
Pearl and Hermes Atoll	PHR-R33	27.78546679	-175.82355
Lisianski Island Marine Area	LIS-09	25.9580487	-173.8823619
Lisianski Island Marine Area	LIS-R10	25.94461746	-173.9536197
Lisianski Island Marine Area	LIS-18	26.00425931	-173.99409
Lisianski Island Marine Area	LIS-R14	26.07838458	-173.9970317
Lisianski Island Marine Area	LIS-R9	26.03954921	-174.0124643
Kure Atoll	KUR-12	28.382308	-178.324479
Kure Atoll	KUR-33	28.416767	-178.378433
Kure Atoll	KUR-02	28.453633	-178.344017
Kure Atoll	KUR-04	28.426650	-178.285870
Kure Atoll	KUR-06	28.386780	-178.347920

However, cruise logistics will influence the specific locations for our study, so I have listed all possible sites below. This ensures maximum flexibility due to weather or unforeseen changes to our cruise schedule. All activities will occur within the area outlined by the following coordinates.

Location: Longitude Latitude

Kure Atoll -178.19706492000 28.55825235580
Kure Atoll -178.19623585400 28.29958375730
Kure Atoll -178.45987884800 28.29958375730
Kure Atoll -178.46070791400 28.55742328970
Midway Atoll -177.19638223300 28.37419969920
Midway Atoll -177.19721129900 28.13377055310
Midway Atoll -177.52800864100 28.13459961920
Midway Atoll -177.52800864100 28.37419969920
Pearl and Hermes Atoll -176.08850981800 28.04643025580
Pearl and Hermes Atoll -175.63289162600 28.04539944540
Pearl and Hermes Atoll -175.63289162600 27.70729363750
Pearl and Hermes Atoll -176.08954062900 27.70626282710
Lisianski Island -173.67292570900 26.25150771120
Lisianski Island -173.67292570900 25.83942708400
Lisianski Island -174.23095155800 25.83942708400
Lisianski Island -174.23095155800 26.25150771120
Laysan Island -171.47900122300 25.96027179830
Laysan Island -171.47725234300 25.65596666490
Laysan Island -171.97918092500 25.65771554490
Laysan Island -171.97918092500 25.96202067840
Maro Reef -170.18133220600 25.69968866680
Maro Reef -170.17958332600 25.21524888540
Maro Reef -171.00505472200 25.21524888540
Maro Reef -171.00505472200 25.69968866680
Gardner Pinnacles -167.74832319300 25.26070709440
Gardner Pinnacles -167.75087047400 24.34878019150
Gardner Pinnacles -168.36221811900 24.35132747340
Gardner Pinnacles -168.36476540100 25.26070709440
French Frigate Shoals -165.93465851400 23.94630965900
French Frigate Shoals -165.93465851400 23.56421738120
French Frigate Shoals -166.45685129400 23.56421738120
French Frigate Shoals -166.45685129400 23.94630965900

5b. Check all applicable regulated activities proposed to be conducted in the Monument:

Removing, moving, taking, harvesting, possessing, injuring, disturbing, or damaging any living or nonliving Monument resource

- Drilling into, dredging, or otherwise altering the submerged lands other than by anchoring a vessel; or constructing, placing, or abandoning any structure, material, or other matter on the submerged lands
- Anchoring a vessel
- Deserting a vessel aground, at anchor, or adrift
- Discharging or depositing any material or matter into the Monument
- Touching coral, living or dead
- Possessing fishing gear except when stowed and not available for immediate use during passage without interruption through the Monument
- Attracting any living Monument resource
- Sustenance fishing (Federal waters only, outside of Special Preservation Areas, Ecological Reserves and Special Management Areas)
- Subsistence fishing (State waters only)
- Swimming, snorkeling, or closed or open circuit SCUBA diving within any Special Preservation Area or Midway Atoll Special Management Area

6 Purpose/Need/Scope *State purpose of proposed activities:*

Bioerosion, the removal of CaCO₃ reef structure by biological agents (Neumann 1966), is a natural process that influences the mechanical stability, structural complexity, and net accretion rate of coral reefs. Extensive bioerosion can compromise the mechanical stability and structural complexity of reefs, thereby increasing susceptibility to storm damage (Hutchings 1986) and decreasing habitat availability for other reef organisms (Hoegh-Guldberg et al. 2007), and organisms that rely on emergent land, including Hawaiian monk seals, sea turtles, and sea birds. Bioeroders may be classified into three functional groups: microborers (e.g., euendoliths), macroborers (e.g., sponges, polychaetes, and bivalves), and grazers (e.g., urchins and fish). Micro- and macroborers erode the interior of reef substrate and are typically more abundant in dead coral substrate than live coral (Highsmith 1981). In the PMNM, micro- and macro-borers communities have remained largely unstudied and, although grazer density has been estimated on a few reefs, erosion rates due to bioeroders of any group have never been measured directly.

The community of bioeroders are a good target for detecting community changes in response to ocean acidification: (i) bioerosion is integral to long-term reef sustainability (Grigg 1982), (ii) bioerosion rates are sensitive to pH (Tribollet et al 2009, Silbiger et al in review), (iii) bioeroder community composition may shift in response to changes in pH, and (iv) applying new technologies will allow the efficient measurement of bioerosion rates and community composition that is critical for managers. The effective use of bioerosion rates as a monitoring and management tool requires distinguishing the effects of ocean acidification from other environmental parameters; this is the challenge that motivates this project. Available predictions of pH in the coastal zones (Orr et al 2005, IPCC 2007) are based on models of open ocean values. Applying these predictions to coral reef ecosystems is complicated by the temporal and spatial variability of pH in coastal waters (Gagliano et al 2010, Guadayol et al 2014). These new studies show substantial small scale variation in pH within and between reef habitats, including a range of natural variation that can be as large as predicted changes in ocean acidification at the global scale This is not unexpected: studies of reef metabolism indicate that these differences in pH may be influenced by relative abundance of respiring and photosynthesizing organisms, flushing rate of the overlying water mass (and, therefore, the presence and thickness of boundary layers), and the history of the water mass. While this variation in pH complicates our predictions of coral reef response to ocean acidification, it also provides an opportunity to examine community-level responses to pH variation and, further, how communities may respond to future change. In this ongoing project, we take advantage of natural variation in the pH over small spatial scales in lagoonal reefs and at large scales over the Hawaiian Archipelago to examine how bioeroding communities may respond to ocean acidification and to test the effectiveness of using bioerosion rates and bioeroder communities as indicators of climate change in remote coral reef systems. We include forereef sites to decrease the within-site variation and examine Archipelago-wide patterns. Bioeroder community composition is being assessed using a

combination of taxonomic and molecular techniques in collaboration with the Bishop Museum and Dr. Rob Toonen's laboratory. We are using mass sequencing of community samples ground-truthed by sequences from taxonomically identified organisms.

The specific objectives identified for this project are:

- 1) Characterize variation in bioeroder community composition within reefs and across the Archipelago using taxonomically-identified samples and mass sequencing
- 2) Measure bioerosion rates using microCT technology
 - a) Compare CaCO₃ loss within and between reefs across the Archipelago
 - b) Measure CaCO₃ accretion
- 3) Evaluate the relationship between pH, bioerosion rate, and bioeroder community composition, controlling for other environmental parameters

7. Answer the Findings below by providing information that you believe will assist the Co-Trustees in determining how your proposed activities are compatible with the conservation and management of the natural, historic, and cultural resources of the Monument:

The Findings are as follows:

a. How can the activity be conducted with adequate safeguards for the cultural, natural and historic resources and ecological integrity of the Monument?

We are a team of conservation biologists, teaching and studying the science of how best to manage and conserve the ecological integrity of marine ecosystems. Therefore, minimizing our impact to the ecosystem we are trying to conserve is a natural and inherent part of any research we conduct within the Monument. It is my goal to inculcate in students and trainees that work with me a respect for the resources that we study. This respect requires that we carefully consider the impact of our study design, that our study design is robust and will produce useful results, and that our work is disseminated to scientists and managers to improve the conservation efforts in these systems. In developing our research methods, we have taken care to minimize any potential negative impacts to the system as outlined in the methods section below. We believe that we have implemented every reasonable safeguard for the natural resources and ecological integrity of the Monument in our research, and we do not expect any detectable impact from our research sampling. As outlined in detail below, our sample size and methodologies have all been selected to provide robust and scientifically rigorous information to managers with the least possible impact to the natural resources of the Monument.

Our work will not impact historic resources: we do not set foot on land within the Monument, and we report but do not touch any submerged artifacts discovered during our diving activities. As in previous years, each participant is required to participate in a Cultural Briefing prior to departure on the Hi'ialakai. Each member of my team is aware of the unique ecological status of the Monument, and this briefing reminds all team members of the cultural significance of the place. However, this separation of natural, cultural, and historic resources is itself a western construct. Stewardship of natural resources is a central theme in the relationship that Hawaiians have with the natural world and, thus, there is no difference between a natural and cultural resource.

Papahānaumokuākea is a sacred place to native Hawaiians; a place that is included in the oral history of chants and mele; a place where native Hawaiians have travelled for hundreds of years. We strive to approach our work in the Monument with the same humility, wonder, and regard for the natural world as these travelers. We intend that our research in the Monument will give a strong foundation to stewardship practices that best manage and protect the coral reefs ecosystems of Papahānaumokuākea. Native Hawaiians learned when and where important food fish were spawning and, understanding their potential impact on fish populations, protected these times and areas. In a similar way, we will be learning about the bioeroding communities of the Monument and trying to understand and mitigate the impacts of anthropogenic climate change

b. How will the activity be conducted in a manner compatible with the management direction of this proclamation, considering the extent to which the conduct of the activity may diminish or enhance Monument cultural, natural and historic resources, qualities, and ecological integrity, any indirect, secondary, or cumulative effects of the activity, and the duration of such effects? The research we propose here is the type of research directly mandated by the Proclamation: it is “research designed to further understanding of monument resources and qualities... [and] will assist in the conservation and management of the monument”. The research we propose is necessary to both maintain ecosystem integrity and provide for adaptive ecosystem management in the face global climate change. As outlined above and below, our activities have no detectable effect to diminish Monument resources, nor have any known indirect, secondary or cumulative effects on the ecosystem or resources therein. Because of concerns about cumulative impacts, a threat assessment of the activities in the Monument have been conducted (Selkoe et al. 2008), and a compiled cumulative impact threat map of the Monument (Selkoe et al. 2009) has been provided to the co-trustees for use in future management decisions.

Our proposed activities are minimally invasive. On forereefs, coral blocks were attached to permanent transect stakes and CAUs (artificial units that measure accretion rates) with cable ties that were previously installed by NOAA's Coral Reef Ecosystem Division (CRED). On lagoon reefs, coral blocks were attached to dead substrate with marine epoxy, carefully avoiding live coral. Under this permit, the last remaining 10 blocks deployed in Midway would be removed. The small samples of dead coral skeleton (no more than thirty 5x5x5cm samples from each of 21 sites) that we plan to collect from reefs are a tiny fraction of the reef substrate removed naturally by external bioeroders (e.g., urchins, parrotfish). Negative impacts on the reefs, atoll, and Monument are exceedingly small, while the positive impacts of the results of our research are Monument-wide.

Our overriding goal is to provide scientific information to managers so that the Papahānaumokuākea Marine National Monument can be managed and protected based on policy grounded in sound science. Our divers are experienced in moving in and around coral and coral reefs so as to not cause damage. Each diver has been through intensive dive training and is a certified scientific diver with the American Association of Underwater Scientists. We are conducting these activities already in Kane'ohe Bay, allowing us to hone our methods to minimize impacts on the Monument.

c. Is there a practicable alternative to conducting the activity within the Monument? If not, explain why your activities must be conducted in the Monument.

There are no alternatives to conducting this activity within the monument. Our research is aimed at understanding how bioerosion processes shift along the Hawaiian Archipelago and it is the reefs in the Monument that will need to be managed. For example, the same information from reefs in the main Hawaiian Islands is interesting – indeed, we are pursuing a similar study in Kaneohe Bay-- but there is no basis upon which to say that the reefs in the Monument are like the Main Hawaiian Island reefs. In fact, we know they are not the same -- Kaneohe Bay has many introduced species that are not present in the Monument.

d. How does the end value of the activity outweigh its adverse impacts on Monument cultural, natural and historic resources, qualities, and ecological integrity?

We anticipate truly negligible impact of our study on the resources of the Monument and, therefore, believe that the end value of this research clearly outweighs that imperceptible impact. Further, an understanding of bioerosion rates across this region will greatly increase the decision making capacity of the co-trustees in dealing with the potential impacts of global climate change within the Monument

e. Explain how the duration of the activity is no longer than necessary to achieve its stated purpose.

It is anticipated that retrieving the remaining coral blocks at Midway will take a half day and that collecting pieces of dead coral skeleton at the FFS, LIS, PHR, and KUR will take 2-3 days per atoll with 2-4 divers. Depending on cruise itineraries, we may need to participate on two cruises to access all of our target sites. As such, the estimated number of days in the monument (50 days) is necessary to accomplish the research goals outlined in this permit application.

f. Provide information demonstrating that you are qualified to conduct and complete the activity and mitigate any potential impacts resulting from its conduct.

Donahue has been an AAUS certified scuba diver and NAUI instructor for 19 years. I have used diving for research and trained others to dive on projects in the Gulf of Maine, California, and Hawaii, including research in other protected areas like the Channel Islands National Park. I have a PhD in Ecology from the University of California, Davis and have publications on marine ecology and spatial population dynamics relevant to this study. This is my fourth permit application for work in the Monument. I was privileged to enter the Monument on the July-August 2011 cruise to deploy/retrieve calcium carbonate blocks for the project outlined in this application and on the May 2010 cruise to support other projects, including Scott Godwin's (PMNM) surveys of invasive species and Rob Toonen's connectivity sampling.

The field PI for the July cruise (anticipating collection at MID, PHR, LIS, FFS, and KUR) is Nyssa Silbiger. She was a field PI on the July-August 2011 and 2012 cruise and also assisted Derek Smith on the May 2010 cruise. Nyssa is a graduate student in my laboratory and an experienced coral reef diver; her masters research was performed at Aquarius, an underwater ocean laboratory located in the Florida Keys National Marine Sanctuary.

g. Provide information demonstrating that you have adequate financial resources available to conduct and complete the activity and mitigate any potential impacts resulting from its conduct.

The project proposed here is a collaboration between the Donahue (sampling of bioeroders) and Toonen (molecular) laboratories at the Hawaii Institute of Marine Biology, and NOAA CRED (site coordination and environmental data). We have funding through Hawaii SeaGrant for this project.

h. Explain how your methods and procedures are appropriate to achieve the proposed activity's goals in relation to their impacts to Monument cultural, natural and historic resources, qualities, and ecological integrity.

Our choice of sites will be guided by the vessel and Monument staff while aboard the NOAA vessel Hi'ialakai. We generally avoid any sites that are identified as culturally significant, and focus our activities in regions that maximize the safety of the crew while ensuring that the proposed work will be completed. The questions we are addressing are central to understanding reef erosion processes and the Monument's response to global climate change. Any negative impacts of our study are minimal and temporary and should not alter the Monument's cultural, natural and historic resources, qualities or ecological integrity. The positive impacts of our study will help guide appropriate stewardship practices to preserve and manage the qualities and integrity of the Monument's cultural and natural and historic resources. Our data is necessary to provide a strong scientific understanding of coral reef ecosystem processes by which proper management protocols can be designed. These data also are invaluable in providing a baseline with which to monitor the success of management efforts.

i. Has your vessel has been outfitted with a mobile transceiver unit approved by OLE and complies with the requirements of Presidential Proclamation 8031?

We will be on board NOAA vessel Hi'ialakai

j. Demonstrate that there are no other factors that would make the issuance of a permit for the activity inappropriate.

We will only be doing activities listed on this permit application

8. Procedures/Methods:

There are two aspects to the study (i) measuring bioerosion rates using experimental coral blocks (microCT) and (ii) characterizing the bioeroding community in dead coral substrate (molecular ID).

(i) Measuring Bioerosion rates:

Under this permit, we will complete the bioerosion rate study by retrieving the ten remaining bioerosion blocks deployed at MID in 2011. The bioerosion rates on these blocks will be compared with bioerosion rates from blocks at the same site deployed for just 1 year. We expect to spend a half day at the Midway lagoon site retrieving these remaining 10 blocks.

These blocks act as settling substrate for bioeroders. Prior to deployment, calcium carbonate blocks were scanned using an eXplore CT120 uCT scanner at Cornell University. Micro computer-aided tomography is a powerful technology for visualizing the internal structure of

solid objects. The exceptional resolution of this technology allows for precise examination of coral skeletal density and the size, shape, and location of each bore hole in a given coral block. By performing pre- and post-deployment scans of the coral blocks, we can accurately measure of the amount of CaCO₃ removed to calculate bioerosion rate, as well as any accretion of CaCO₃ by crustose coralline algae. Pre and post-deployment scans will be aligned and subtracted to show the total volume of lost substrate and the size, shape, and location of excavation sites. Using the blocks retrieved under this permit, we will be able to compare 1-year vs 3-year bioerosion rates at the same site (Midway Lagoon).

(ii) Characterization of the bioeroding community by mass sequencing.

Under this permit, we propose to sample up to 30 small pieces (5x5x5cm) of dead coral skeleton at each of 21 sites (5 each at FFS, LIS, PHR, KUR, and 1 at MID) for a total of 630 small pieces of dead coral skeleton. We expect to take 2-3 days each at FFS, LIS, PHR, and KUR to complete the sampling. These are our planned sampling locations, but we request the flexibility to sample at other locations depending on cruise logistics (total take will not exceed 630 small pieces of dead coral skeleton = 0.079 cubic meters total take). These samples of dead *Porites* sp. skeleton will be taken using a rock hammer and chisel, taking care to avoid live coral. Shipboard, in the Monument, samples will be stored in vials of >70% ethanol or saturated salt buffer at room temperature and given a unique sample number. Upon return to HIMB, samples will be homogenized to form a slurry and mass sequenced to characterize within and between atoll community diversity for the cyptic bioeroding fauna. The DNA sequences extracted from this slurry will be compared to samples collected under our 2012 permit. These previous samples were sorted and identified taxonomically by Scott Godwin (PMNM) and Holly Bolick (Bishop Museum), and sequenced by Eric Tong in the Toonen lab. These sequences will allow us to identify particular organisms from samples taken for mass sequencing on this permit.

NOTE: If land or marine archeological activities are involved, contact the Monument Permit Coordinator at the address on the general application form before proceeding, as a customized application will be needed. For more information, contact the Monument office on the first page of this application.

9a. Collection of specimens - collecting activities (would apply to any activity): organisms or objects (List of species, if applicable, attach additional sheets if necessary):

Common name:

We will be collecting pieces of dead *Porites* spp. skeleton. Dead coral skeleton harbors a diverse community of bioeroding organisms that has not been systematically targeted for study previously in the PMNM. One of the goals of this project is to more thoroughly document the composition of the bioeroding community in the PMNM. Based on studies in the MHI and previous work of the Census of Marine Life, we anticipate a wide variety of sponges and marine

worms, as well as hydrozoans, bryozoans, barnacles, tiny mollusks, and turf algae. We expect a subset of these organisms will settle on our deployed blocks of calcium carbonate. Although we cannot give a specific list of the numbers of individual species we will find in samples, we have attached a list of bioeroders and other organisms that commonly settle on coral skeleton in Kaneohe Bay, Oahu (based on White 1980 and our own observations) and that we identified from the 2012 PMNM collections.

Scientific name:
dead Porites spp skeleton

& size of specimens:
up to 630 pieces, 5x5x5 cm each (total: 0.079 cubic meters)

Collection location:
30 pieces per site at up to 21 sites

Whole Organism Partial Organism

9b. What will be done with the specimens after the project has ended?

Preserved samples remain the property of the Monument and will be made available to others requesting access to these materials through the appropriate permit process. PI Donahue will maintain a database of samples and provide for the storage of all samples collected at HIMB until they are consumed by the study or such time as the Monument co-trustees request that they be returned to them. Taxonomic voucher specimens will be submitted for permanent inclusion in the Bishop or Smithsonian museum collections as per the terms of material transfer agreement

9c. Will the organisms be kept alive after collection? Yes No

• General site/location for collections:

• Is it an open or closed system? Open Closed

• Is there an outfall? Yes No

• Will these organisms be housed with other organisms? If so, what are the other organisms?

- Will organisms be released?

10. If applicable, how will the collected samples or specimens be transported out of the Monument?

Calcium carbonate blocks and samples of dead coral tissue will be preserved for genetic analyses (in ethanol or saturated salt buffer) and transported back to HIMB aboard the R/V Hi'ialakai. See attached MSDS sheets

11. Describe collaborative activities to share samples, reduce duplicative sampling, or duplicative research:

All HIMB researchers working on similar species have coordinated to share samples and avoid duplicate sampling. This project reflects this coordination, as a joint effort between the Donahue and Toonen laboratories at HIMB, and NOAA CRED. HIMB and NOAA monument staff hold semiannual meeting and annual meetings with other agencies working in the monument so that research projects and resources available are widely known. To my knowledge, no other systematic collections of internal bioeroders and measures of bioerosion rates have been made in the Monument.

Anticipated sharing of collections:

Samples of bioeroders in dead *Porites* spp. skeleton: We anticipate doing most of the sample processing at HIMB, including extracting bioeroding organisms from the samples, most morphological inspection, DNA extraction, and sequencing. We anticipate sharing samples with Holly Bolick at the Bishop Museum [REDACTED]

12a. List all specialized gear and materials to be used in this activity:

- Divers will use standard open-circuit SCUBA and snorkling equipment.
- We will retrieve calcium carbonate blocks by cutting cable-ties with clippers or a dive knife
- On the ship, samples of dead coral skeleton and calcium carbonate blocks will be placed in plastic containers filled with ethyl alcohol or salt-saturated dimethyl sulfate.

12b. List all Hazardous Materials you propose to take to and use within the Monument:

Tissue preservative solutions for DNA analyses include: 95% ethanol (EtOH) and saturated salt buffer with dimethylsulfoxide (DMSO). MSDS sheets attached

13. Describe any fixed installations and instrumentation proposed to be set in the Monument:

In 2011, a total of 95 calcium carbonate blocks were attached to CAUs with cable ties or to bare rock with marine epoxy. In 2012, we removed all but 10 blocks deployed in 2011. In 2012 we also deployed 25 blocks at Kure Atoll, which were removed in 2013. We are requesting to remove the last 10 blocks that were fixed onto bare substrate at Midway atoll.

14. Provide a time line for sample analysis, data analysis, write-up and publication of information:

Analysis of bioeroders in the pieces of dead coral skeleton will take up to a year, as it requires

DNA extraction and sequencing and running the entire sample using a bioinformatics approach. We anticipate that extraction of organisms, and DNA extraction and sequencing will take place within one year of returning from the cruise. Once the calcium carbonate blocks are retrieved in August, 2014, we will immediately send them to the microCT laboratory at Cornell University to be scanned. All blocks collected from previous cruises have already been scanned and are currently being analyzed for bioerosion rates.

The molecular analysis of bioeroder communities in environmental samples of dead coral skeleton will be completed and submitted for publication within two years of the cruise. Analysis of bioerosion rates and community composition based on taxonomy is underway from prior collections and will be completed within 1 years of this cruise. Regardless of the time to publication, the results from these studies are made available to Monument managers as quickly as possible through semi-annual reports and ongoing cooperation with the broader management community. We also reach the NGO community and general public each year with presentations at the Hawaii Conservation Conference, Hanauma Bay seminar series, and other education and outreach venues. In sum, these efforts ensure that research results are provided to the Monument co-trustees almost as quickly as they become available, and made available to the greater management community within no more than one year of the data being collected

15. List all Applicants' publications directly related to the proposed project:

Guadayol O, NJ Silbiger, MJ Donahue, FI Thomas. 2014. Patterns in temporal variability of pH, temperature and oxygen along an environmental gradient across a coral reef. PLOS One 9.1: e85213.

Silbiger NJ, O Guadayol, FI Thomas, MJ Donahue. Submitted. Reefs shift from net accretion to erosion with rising ocean acidity.

With knowledge of the penalties for false or incomplete statements, as provided by 18 U.S.C. 1001, and for perjury, as provided by 18 U.S.C. 1621, I hereby certify to the best of my abilities under penalty of perjury of that the information I have provided on this application form is true and correct. I agree that the Co-Trustees may post this application in its entirety on the Internet. I understand that the Co-Trustees will consider deleting all information that I have identified as "confidential" prior to posting the application.

Signature

Date

SEND ONE SIGNED APPLICATION VIA MAIL TO THE MONUMENT OFFICE BELOW:

Papahānaumokuākea Marine National Monument Permit Coordinator
6600 Kalaniana'ole Hwy. # 300
Honolulu, HI 96825
FAX: (808) 397-2662

DID YOU INCLUDE THESE?

- Applicant CV/Resume/Biography
- Intended field Principal Investigator CV/Resume/Biography
- Electronic and Hard Copy of Application with Signature
- Statement of information you wish to be kept confidential
- Material Safety Data Sheets for Hazardous Materials

Papahānaumokuākea Marine National Monument Compliance Information Sheet

1. Updated list of personnel to be covered by permit. List all personnel names and their roles here (e.g. John Doe, Diver; Jane Doe, Field Technician, Jerry Doe, Medical Assistant):

Megan Donahue, PI, Diver
 Hawai'i Inst of Marine Biology
 46-007 Lilipuna Rd, Kāne'ōhe, HI 96744
 808-236-7417
donahuem@hawaii.edu

Nyssa Silbiger, Field PI, Diver
 Hawai'i Inst of Marine Biology
 46-007 Lilipuna Rd, Kāne'ōhe, HI 96744
 808-236-7424
silbiger@hawaii.edu

Chelsie Counsell, Diver
 Hawai'i Inst of Marine Biology
 46-007 Lilipuna Rd, Kāne'ōhe, HI 96744
 808-236-7424
counsell@hawaii.edu

TBD, Diver

2. Specific Site Location(s): (Attach copies of specific collection locations):

The following is a list of our targeted sites, where we have previously deployed bioerosion blocks and would like to collect samples for the bioeroder community survey:

Island/Atoll	Site Name	Latitude (Decimal Degrees)	Longitude (Decimal Degrees)
French Frigate Shoals	FFS-34	23.62792	-166.13538
French Frigate Shoals	FFS-12	23.63835	-166.18005
French Frigate Shoals	FFS-H6	23.88046	-166.27306
French Frigate Shoals	FFS-21	23.84695	-166.32701
French Frigate Shoals	FFS-33	23.83651	-166.26669
Pearl and Hermes Atoll	PHR-39	27.94045941	-175.8613056
Pearl and Hermes Atoll	PHR-44	27.91026	-175.90483
Pearl and Hermes Atoll	PHR-42	27.75312882	-175.9489414
Pearl and Hermes Atoll	PHR-R26	27.78583	-175.78028
Pearl and Hermes Atoll	PHR-R33	27.78546679	-175.82355

Kure Atoll	KUR-12	28.38231	-178.32448
Kure Atoll	KUR-R33	28.41677	-178.37843
Kure Atoll	KUR-02	28.45363	-178.34402
Kure Atoll	KUR-04	28.42665	-178.28587
Kure Atoll	KUR-06	28.38678	-178.34792
Lisianski Island Marine Area	LIS-18	26.00428	-173.99403
Lisianski Island Marine Area	LIS-R14	26.07841	-173.99701
Lisianski Island Marine Area	LIS-R9	26.03941	-174.01254
Lisianski Island Marine Area	LIS-R10	25.94452	-173.95351
Lisianski Island Marine Area	LIS-09	25.95807	-173.88239
Midway Atoll	MID-H11A	28.217667	-177.403217

While the above table represents our targeted sites, our sampling depends entirely on cruise logistics. Therefore, we request flexibility to visit alternative forereef sites throughout PMNM, which are encompassed in the coordinates below. This would allow us to look at trends in bioeroder community composition across the Archipelago, even if we are not able to return to the specific sites that the bioerosion blocks were deployed.

Island/Atoll	Latitude (Decimal Degrees)	Longitude (Decimal Degrees)
Kure	-178.1970649	28.55825236
Kure	-178.1962359	28.29958376
Kure	-178.4598788	28.29958376
Kure	-178.4607079	28.55742329
Midway	-177.1963822	28.3741997
Midway	-177.1972113	28.13377055
Midway	-177.5280086	28.13459962
Midway	-177.5280086	28.3741997
PHR	-176.0885098	28.04643026
PHR	-175.6328916	28.04539945
PHR	-175.6328916	27.70729364
PHR	-176.0895406	27.70626283
Lisianski	-173.6729257	26.25150771
Lisianski	-173.6729257	25.83942708
Lisianski	-174.2309516	25.83942708
Lisianski	-174.2309516	26.25150771
Laysan	-171.4790012	25.9602718
Laysan	-171.4772523	25.65596666
Laysan	-171.9791809	25.65771554
Laysan	-171.9791809	25.96202068
Maro	-170.1813322	25.69968867
Maro	-170.1795833	25.21524889

Maro	-171.0050547	25.21524889
Maro	-171.0050547	25.69968867
Gardner	-167.7483232	25.26070709
Gardner	-167.7508705	24.34878019
Gardner	-168.3622181	24.35132747
Gardner	-168.3647654	25.26070709
FFS	-165.9346585	23.94630966
FFS	-165.9346585	23.56421738
FFS	-166.4568513	23.56421738
FFS	-166.4568513	23.94630966

3. Other permits (list and attach documentation of all other related Federal or State permits):

PMNM-2011-032
 SAP-2012-61-Silbiger
 PMNM-2012-033

- a. For each of the permits listed, identify any permit violations or any permit that was suspended, amended, modified or revoked for cause. Explain the circumstances surrounding the violation or permit suspension, amendment, modification or revocation.**

PMNM-2011-032 was amended to PMNM-2011-032-M1 for the following changes: (i) amended to reflect a change in 2011 cruise logistics that required taking fewer samples (10 samples/site at 16 sites) in more locations, rather than more samples in fewer locations (20 samples/site at 8-10 sites); the total amount of collection (200 samples) was unchanged; (ii) amended to allow sharing of sea water samples with Dr's Winn and Kahng on permit PMNM-2011-0221 to limit duplicative field work.

We received SAP-2012-61-Silbiger to perform a coordinated study (deploy bioerosion blocks and collect bioeroder samples) in the MHI; there have been no violations or modifications to that permit.

4. Funding sources (Attach copies of your budget, specific to proposed activities under this permit and include funding sources. See instructions for more information):

Nyssa Silbiger (advisor: Donahue) is supported by a NOAA Nancy Foster Scholarship (2012 – 2015), and this project represents part of her doctoral dissertation, including measurement of bioerosion rates and description of bioeroder community composition from sorted specimens. Eric Tong (advisor: Toonen) is supported by a Sea Grant Traineeship associated with this project; Eric has developed the molecular techniques for

the bioeroder community analysis on this project and will use the samples collected on this cruise for the molecular analysis of community composition across the Archipelago. The primary funds to support this project have come from the Sea Grant, "Bioeroding communities and response to climate change" Donahue (PI), Toonen (AI), Thomas (AI). \$142,118 over 24 mos, including SeaGrant Trainee. Hawaii SeaGrant. March 1, 2012 – July 31, 2014. Additional funds have been provided through the NWHI-HIMB MOA and through the University of Hawai'i.

5. Time frame:

The proposed activities will occur in the Monument between July 1, 2014 and October 31, 2014; the specific dates depend entirely on the cruise dates for the R/V Hi'ialakai.

6. Indicate (with attached documentation) what insurance policies, bonding coverage, and/or financial resources are in place to pay for or reimburse the Monument trustees for the necessary search and rescue, evacuation, and/or removal of any or all persons covered by the permit from the Monument:

All divers are requested to carry DAN insurance in addition to UH Worker's Compensation that will cover any diving related injury or an accident that occurs while on a diving research cruise.

7. Check the appropriate box to indicate how personnel will enter the Monument:

- Vessel
 Aircraft

Provide Vessel and Aircraft information: We will enter the Monument on the NOAA R/V Hi'ialakai

8. The certifications/inspections (below) must be completed prior to departure for vessels (and associated tenders) entering the Monument. Fill in scheduled date (attach documentation):

- Rodent free, Date:
 Tender vessel, Date:
 Ballast water, Date:
 Gear/equipment, Date:
 Hull inspection, Date:

9. Vessel information (NOTE: if you are traveling aboard a National Oceanic and Atmospheric Administration vessel, skip this question):

Vessel name:
Vessel owner:

Captain's name:
IMO#:
Vessel ID#:
Flag:
Vessel type:
Call sign:
Embarkation port:
Last port vessel will have been at prior to this embarkation:
Length:
Gross tonnage:
Total ballast water capacity volume (m³):
Total number of ballast water tanks on ship:
Total fuel capacity:
Total number of fuel tanks on ship:
Marine Sanitation Device:
Type:

Explain in detail how you will comply with the regulations regarding discharge in the Monument. Describe in detail. If applicable, attach schematics of the vessel's discharge and treatment systems:

Other fuel/hazardous materials to be carried on board and amounts:

Provide proof of a National Oceanic and Atmospheric Administration (NOAA) Office of Law Enforcement-approved Vessel Monitoring System (VMS). Provide the name and contact information of the contractor responsible for installing the VMS system. Also describe VMS unit name and type:

VMS Email:
Inmarsat ID#:
Contact:

*Individuals MUST ENSURE that a type-approved VMS unit is installed and that its automatic position reports are being properly received by the NOAA OLE system prior to the issuance of a permit. To make sure your VMS is properly configured for the NOAA OLE system, please contact NOAA OLE at (808) 203-2503 or (808) 203-2500.

*PERMITS WILL NOT BE ISSUED TO INDIVIDUALS ENTERING THE MONUMENT VIA VESSEL UNTIL NOAA OLE HAS CONTACTED THE MONUMENT PERMIT COORDINATOR WITH A 'POSITIVE CHECK' READING.

10. Tender information:

On what workboats (tenders) will personnel, gear and materials be transported within the Monument? List the number of tenders/skiffs aboard and specific types of motors:

Additional Information for Land Based Operations

11. Proposed movement of personnel, gear, materials, and, if applicable, samples:

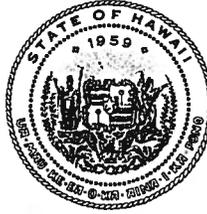
12. Room and board requirements on island:

13. Work space needs:

DID YOU INCLUDE THESE?

- Map(s) or GPS point(s) of Project Location(s), if applicable
- Funding Proposal(s)
- Funding and Award Documentation, if already received
- Documentation of Insurance, if already received
- Documentation of Inspections
- Documentation of all required Federal and State Permits or applications for permits

NEIL ABERCROMBIE
GOVERNOR OF HAWAII



STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

June 27, 2014

TO: Division of Aquatic Resources File

THROUGH: William J. Aila Jr., Chairperson

FROM: Frazer McGilvray
Division of Aquatic Resources

A handwritten signature in black ink, appearing to be "F. McGilvray", is written over the printed name.

WILLIAM J. AILA, JR.
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

JESSE K. SOUKI
FIRST DEPUTY

WILLIAM M. TAM
DEPUTY DIRECTOR - WATER

AQUATIC RESOURCES
BOATING AND OCEAN RECREATION
BUREAU OF CONVEYANCES
COMMISSION ON WATER RESOURCE MANAGEMENT
CONSERVATION AND COASTAL LANDS
CONSERVATION AND RESOURCES ENFORCEMENT
ENGINEERING
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
KAHOOLAWE ISLAND RESERVE COMMISSION
LAND
STATE PARKS

DECLARATION OF EXEMPTION FROM THE PREPARATION OF AN ENVIRONMENTAL ASSESSMENT UNDER THE AUTHORITY OF CHAPTER 343, HRS AND CHAPTER 11-200 HAR, FOR PAPAĀNAUMOKUĀKEA MARINE NATIONAL MONUMENT RESEARCH PERMIT TO DR. MEGAN DONAHUE, HAWAII INSTITUTE OF MARINE BIOLOGY, UNIVERSITY OF HAWAII, FOR ACCESS TO STATE WATERS TO CONDUCT BIOEROSION STUDY ACTIVITIES UNDER PERMIT PMNM-2014-024.

The following permitted activities are found to be exempted from preparation of an environmental assessment under the authority of Chapter 343, HRS and Chapter 11-200, HAR:

Project Title:

Papahānaumokuākea Marine National Monument Research Permit to Dr. Megan Donahue, Associate Professor, Hawaii Institute of Marine Biology, University of Hawaii, for Access to State Waters to Conduct Bioerosion Study Activities.

Permit Number: PMNM-2014-024

Project Description:

The research permit, as described below, would allow entry and activities to occur in Papahānaumokuākea Marine National Monument (Monument), including the NWHI State waters from August 1, 2014 through July 31, 2015.

The proposed project would evaluate bioerosion rates and bioeroder community structure on reefs in the Monument enabling researchers to determine whether internal bioeroders could serve as indicators of community response to ocean acidification on coral reefs. Bioerosion rates would be characterized and compared between the Main Hawaiian Islands and Northwestern Hawaiian Islands, including bioeroder community structure and indicators of community response to ocean acidification. The methods developed from these activities would help managers anticipate the likely effects of ocean acidification on bioeroder communities and bioerosion rates.

Up to six (6) individuals would be authorized to enter the Monument and conduct activities. Proposed activities would initially occur from the RV HI'IALAKAI (separately permitted under PMNM-2014-005) from August 7 – 31, 2014 at French Frigate Shoals, Lisianski Island, Pearl and Hermes Atoll, and Midway Atoll. The proposed activities include snorkeling and/or SCUBA to:

1. Retrieve ten (10) bioerosion blocks deployed in 2011 at Midway Atoll, and
2. Measure the variation in bioeroder community composition by collecting twenty (20) small pieces (5 by 5 by 5 cm) of dead coral skeleton (*Porites* spp.) at each of twenty-nine (29) sites (total of up to 580 small pieces of dead coral skeleton). All forereef sites are co-located with NOAA-CRED permanent sites. All island locations also include forereef and lagoon sampling sites. The sampling of small pieces of dead coral skeleton would take about two to three days each island location. Bioerosion rates would be assessed in the laboratory using a combination of taxonomic and molecular techniques in collaboration with the Bishop Museum and Dr. Rob Toonen's laboratory.

The proposed activities are in direct support of the Monument Management Plan's priority management needs 3.1 – Understanding and Interpreting the NWHI (through action plan 3.1.1 Marine Conservation Science). This action plan specifies to “marine research, characterization, and monitoring designed to support an ecosystem-based approach to protection and management” (Activity MCS-1.2: Continue monitoring of shallow-water coral reef ecosystems to protect ecological integrity, PMNM MMP Vol 1, p. 123). It also notes that monitoring data can help scientists understand causes of change. Activities to support marine conservation science, including community composition and change studies such as those to be carried out by the permittee, are also addressed in the Monument Management Plan (MMP) Environmental Assessment (EA) (FONSI, December 2008). This EA summarizes that understanding the populations change could be helpful to forecast, prepare for and mediate potential threats to populations within the Monument (PMNM MMP Vol 2, p. 171). Measurements of bioerosion rates and community composition, such as those proposed, would enhance this understanding.

Consulted Parties:

The permit application was sent out for review and comment to the following scientific and cultural entities: Hawaii Division of Aquatic Resources, Hawaii Division of Forestry and Wildlife, Papahānaumokuākea Marine National Monument (NOAA/NOS), NOAA Pacific Islands Regional Office (NOAA-PIRO), United States Fish and Wildlife Service Hawaiian and Pacific Islands National Wildlife Refuge Complex Office, and the Office of Hawaiian Affairs (OHA). In addition, the permit application has been posted on the Monument Web site since March 17, 2014 giving the public an opportunity to comment. The application was posted within 40 days of its receipt, in accordance with the Monument's Public Notification Policy.

Exemption Determination:

After reviewing HAR § 11-200-8, including the criteria used to determine significance under HAR § 11-200-12, DLNR has concluded that the activities under this permit would have minimal or no significant effect on the environment and that issuance of the permit is categorically exempt from the requirement to prepare an environmental assessment based on the following analysis:

1. All activities associated with this permit; including the measuring of bioeroder rates and community composition; have been evaluated as a single action. As a preliminary matter, multiple or phased actions, such as when a group of actions are part of a larger undertaking, or when an individual project is precedent to or represents a commitment to a larger project, must be grouped together and evaluated as a single action. HAR § 11-200-7. This permit may involve an activity that is precedent to a later planned activity, i.e. the continuation of bioerosion studies; the categorical exemption determination here will treat all planned activities as a single action.

2. The Exemption Class for Scientific Research with no Serious or Major Environmental Disturbance Appears to Apply. Chapter 343, HRS, and § 11-200-8, HAR, provide for a list of classes of actions exempt from environmental assessment requirements. HAR §11-200-8.A.5. exempts the class of actions which involve “basic data collection, research, experimental management, and resource evaluation activities which do not result in a serious or major disturbance to an environmental resource.” The proposed removal activities here appear to fall squarely under the exemption class #5, exempt item #2 as described under the Division of Forestry and Wildlife exemption list published on June 12, 2008. This exemption class has been interpreted to include “surveys, new transect lines, recording, and sampling”, such as those being proposed. As discussed below, no significant disturbance to any environmental resource is anticipated in the bioerosion studies. Thus, so long as the below considerations are met, an exemption class should include the action now contemplated.

To minimize the potential of disease introduction or transfer during field sampling and diving activities, the applicant would follow Monument Best Management Practice (BMP) 011 – Disease and Introduced Species Prevention. For sample storage and transport, the applicant would follow Monument BMP 006 – General Storage and Transport Protocols for Collected Samples. The applicant would also follow Monument BMP 004 – Boat Operations and Diving Activities to eliminate any adverse impacts of protected marine species during boating and diving activities.

3. Cumulative Impacts of Actions in the Same Place and Impacts with Respect to the Potentially Particularly Sensitive Environment Will Not be Significant. Even where a categorical exemption appears to include a proposed action, the action cannot be declared exempt if “the cumulative impact of planned successive actions in the same place, over time, is significant, or when an action that is normally insignificant in its impact on the environment may be significant in a particularly sensitive environment.” HAR § 11-200-8.B. To gauge whether a significant impact or effect is probable, an exempting agency must consider every phase of a proposed action, any expected primary and secondary consequences, the long-term and short-term effects of the action, the overall and cumulative effect of the action, and the sum effects of an action on the quality of the environment. HAR § 11-200-12. Examples of actions which commonly have a significant effect on the environment are listed under HAR § 11-200-12.

This project, started in 2011, is the first systematic documentation of internal bioeroders and their respective bioerosion rates in the Monument. However, the majority of activities to be carried out (collection and block deployments) are standard marine research tasks that have been used in the Monument before, with no deleterious impacts. With this in mind, significant cumulative impacts

are not anticipated as a result of this activity, and numerous safeguards further ensure that the potentially sensitive environment of the project area will not be significantly affected. All activities will be conducted in a manner compatible with the management direction of the Monument Proclamation in that activities do not diminish monument resources, qualities, and ecological integrity, or have any indirect, secondary, cultural, or cumulative effects. The joint permit review process did not reveal any anticipated indirect or cumulative impacts, nor did it raise any cultural concerns, that would occur as a result of these activities.

The proposed project would be supported by the NOAA ship R/V HI'IALAKAI (PMNM-2014-005), from August 7 - 31, 2014. Table 1 lists additional activities that are anticipated to take place on this ship pending approval of permit applications. Table 2 lists activities potentially occurring at the same time as the proposed project. At this time, no other concurrent activities are known. The culmination of this permit, occurring throughout the Monument over approximately one month, is not anticipated to have significant cumulative impacts.

Table 1: Concurrent projects aboard NOAA Ship HI'IALAKAI

Permit	Purpose and scope	Location
PMNM-2014-005 Ellis-Simon HI'IALAKAI (approved)	This permit allows the NOAA Ship HI'IALAKAI entry into the Monument. Personnel aboard the vessel would be permitted under separate permits	All locations
PMNM-2014-014 Meyer (proposed)	This proposed action would be to conduct top predator research consisting of fishing for various shark and fish species.	French Frigate Shoals, Pearl and Hermes, Midway
PMNM-2014-012 Couch (proposed)	This proposed action would be to conduct coral health and community structure assessment surveys in the NWHI.	All locations
PMNM-2014-025 Donahue (proposed)	This proposed action would be to characterize <i>Pocillopora meandrina</i> (POME) colony fish and invertebrate communities.	All locations
PMNM-2014-018 Godwin (proposed)	This proposed action would be conduct Pacific Reef Assessment and Monitoring Program.	All locations

Table 2: Concurrent projects about NOAA ship SETTE

Permit	Purpose and scope	Location
PMNM-2014-005 Koes SETTE (approved)	This permit allows the NOAA SETTE entry into the Monument. Personnel aboard the vessel would be permitted under separate permits	All locations
PMNM-2014-001 Co-Trustee (approved)	This permit allows monk seal field camp operations with activities from June - September 2014.	French Frigate Shoals, Lisianski Island, Pearl and Hermes Atoll, Midway Atoll, Kure Atoll

Since no significant cumulative impacts or significant impacts with respect to any particularly sensitive aspect of the project area are anticipated, the categorical exemptions identified above should remain applicable.

4. Overall Impacts will Probably be Minimal and Insignificant Any foreseeable impacts from the proposed activity will probably be minimal, and further mitigated by general and specific conditions attached to the permit. Specifically, all conservation and management activities covered by this permit will be carried out with strict safeguards for the natural, historic, and cultural resources of the Monument as required by Presidential Proclamation 8031, other applicable law and agency policies and standard operating procedures.

Conclusion. Upon consideration of the permit to be approved by the Board of Land and Natural Resources, the potential effects of the above listed project as provided by Chapter 343, HRS and Chapter 11-200 HAR, have been determined to be of probable minimal or no significant effect on the environment and exempt from the preparation of an environmental assessment.

William J. Aila Jr.
Board of Land and Natural Resources

Date



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JUN 06 2014

David Swatland
Acting Superintendent
Papahānaumokuākea Marine National Monument
Office of National Marine Sanctuaries
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Honolulu, HI 96825

Dear Mr. Swatland:

This letter responds to your May 22, 2014 Request for Consultation regarding issuance of a permit to applicant Donahue to conduct coral reef research, surveys, and video monitoring within the Papahānaumokuākea Marine National Monument, and the issuance of up to five research permits over the next five years to applicant Gleason to conduct tow-board surveys and magnetometer deployments to search for and document new maritime archeological sites (PMNM 2014). You have requested our concurrence under Section 7 of the Endangered Species Act of 1973 (ESA), as amended (16 U.S.C. §1531 et seq.), with your determination that the proposed action may affect but is not likely to adversely affect green, hawksbill, leatherback, olive ridley, and north Pacific loggerhead sea turtles; humpback whales, blue whales, fin whales, sei whales, sperm whales, north Pacific right whales, and Hawaiian monk seals.

Proposed Action/Action Area: The proposed activity is described in your request for consultation and the associated biological evaluation (PMNM 2014) and further clarified via email exchange (NMFS and PMNM 2014). In summary, the proposed action consists of issuing a 2014 permit to applicant Donahue to conduct underwater surveys and video recording to describe cryptic species living in coral colonies within the Papahānaumokuākea Marine National Monument. Activities will take place in shallow water (30 to 100 feet) and consist of swimming, snorkeling, and SCUBA, visual surveys and photography/videography of coral colonies, and sample collection from fish and invertebrates. Video recording stations would include two GoPro cameras mounted to an adjustable tripod stabilized by three-pound weights attached to each tripod foot. A surface buoy will be tethered to the tripod with 20 feet of scope (slack line) at each depth deployment to avoid wave action toppling over the station. Target deployment depths would be 30 to 80 feet and camera stations would be deployed for 30 to 60 minutes. Only one video station would be



deployed at any given time and the total time of deployment over the entire research period would not exceed 16 hours (in increments of one hour or less).

Additional but separate activities included in the consultation request include the issuance of up to five permits over the next five years (2014 – 2018) to applicant Gleason to conduct tow board and magnetometer surveys to search for new maritime archeological sites within the Monument. Tow-board surveys will consist of two snorkelers towed 75 feet behind the boat at speeds of up to 4 miles per hour. Over a five year period, it is estimated that the applicant would conduct approximately 500 hours of tow-board surveys. In addition, magnetometer surveys would consist of towing a passive magnetometer approximately 50 feet behind the boat at speeds up to 4 miles per hour. Over a five year period, it is estimated that the applicant would conduct approximately 500 hours of magnetometer surveys. The action area includes all nearshore marine areas within PMNM.

Species That May Be Affected: PMNM determined that the proposed action may affect but is not likely to adversely affect Hawaiian monk seals (*Monachus schauinslandi*), green sea turtles (*Chelonia mydas*), hawksbill sea turtles (*Eretmochelys imbricata*), the north Pacific distinct population segment of loggerhead sea turtles (*Caretta caretta*), olive ridley sea turtles (*Lepidochelys olivacea*), leatherback sea turtles (*Dermochelys coriacea*), humpback whales (*Megaptera novaeangliae*), sperm whales (*Physeter macrocephalus*), fin whales (*Balaenoptera physalus*), blue whales (*Balaenoptera musculus*), sei whales (*Balaenoptera borealis*), and north Pacific right whales (*Eubalaena japonica*). Detailed information about the biology, habitat, and conservation status of sea turtles can be found in their recovery plans and other sources at <http://www.nmfs.noaa.gov/pr/species/turtles/>. The same can be found for Hawaiian monk seals and cetaceans at <http://www.nmfs.noaa.gov/pr/species/mammals/>.

Critical Habitat: The proposed action would take place within designated monk seal critical habitat. Critical habitat was designated under the ESA for the Hawaiian monk seal on April 30, 1986 and revised on May 26, 1988. Designated critical habitat includes all beach areas, lagoon waters, and ocean waters out to a depth of 20 fathoms around Kure Atoll; Midway Islands (except Sand Island), Pearl and Hermes Reef, Lisianski Island, Laysan Island, Gardner Pinnacles, French Frigate Shoals, Necker Island, Maro Reef, and Nihoa Island. On June 2, 2011, NMFS proposed revising critical habitat for monk seals by extending the current designation out to the 500 meter depth contour and including Sand Island at Midway Island but this proposal is not yet final.

Analysis of Effects: In order to determine that a proposed action is not likely to adversely affect listed species, NMFS must find that the effects of the proposed action are expected to be insignificant, discountable, or beneficial as defined in the joint USFWS-NMFS Endangered Species Consultation Handbook: (1) insignificant effects relate to the size of the impact and should never reach the scale where take occurs; (2) discountable effects are those that are extremely unlikely to occur; and (3) beneficial effects are positive effects without any adverse

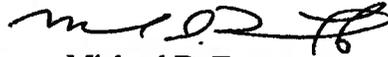
effects (USFWS & NMFS 1998). This standard, as well as consideration of the probable duration, frequency, and severity of potential interactions between the marine listed species and the proposed action, were applied during the analysis of effects on ESA-listed marine species as described in the PMNM initiation request and supplemental emails. PMNM determined that the potential for temporary disturbance of protected species is insignificant and potential for entanglement, vessel collisions, and impacts to monk seal critical habitat is discountable for both applicants' proposed activities. PMNM addressed all of these stressors in the consultation request and supplemental materials providing mitigation measures, best management practices, and impact analyses to justify your determinations (PMNM 2014; NMFS and PMNM 2014). Therefore, based on the description of the proposed action, the described Best Management Practices, the effects analyses provided by PMNM, and the best information available to describe the behaviors and biological needs of the species considered here, NMFS agrees that the proposed action would result in insignificant impacts, or the likelihood of impacts would be discountable, for ESA-listed green, hawksbill, leatherback, olive ridley, and north Pacific loggerhead sea turtles; humpback whales, blue whales, fin whales, sei whales, sperm whales, north Pacific right whales, and Hawaiian monk seals.

Conclusion: NMFS concurs with your determination that the proposed action may affect, but is not likely to adversely affect ESA-listed marine species or designated critical habitat. Our concurrence is based on the finding that the effects of the proposed action are expected to be insignificant, discountable, or beneficial as defined in the joint USFWS-NMFS Endangered Species Consultation Handbook (USFWS & NMFS 1998) and summarized at the beginning of the Analysis of Effects section above. This concludes your consultation responsibilities under the ESA for species under NMFS's jurisdiction. However, this consultation focused solely on compliance with the ESA. Additional compliance review that may be required of NMFS for this action (such as assessing impacts on Essential Fish Habitat) would be completed by NMFS Habitat Conservation Division in separate communication, if applicable.

ESA Consultation must be reinitiated if: 1) a take occurs; 2) new information reveals effects of the action that may affect listed species or designated critical habitat in a manner or to an extent not previously considered; 3) the identified action is subsequently modified in a manner causing effects to listed species or designated critical habitat not previously considered; or 4) a new species is listed or critical habitat designated that may be affected by the identified action.

If you have further questions please contact Kim Maison on my staff at (808) 725-5143. Thank you for working with NMFS to protect our nation's living marine resources.

Sincerely,



Michael D. Tosatto
Regional Administrator

cc: Justin Rivera, Papahanaumokuakea Marine National Monument
Aaron Nadig, ESA Section 7 Program, USFWS, Honolulu

NMFS File No.: PIR-2014-9485
PIRO Reference No.: I-PI-14-1184-LVA

Literature Cited

Papahanaumokuakea Marine National Monument (PMNM). 2014. Request for Informal Consultation. Letter from David Swatland to Alecia VanAtta dated May 22, 2014 and attachments.

NMFS and PMNM. 2014. Email correspondence regarding consultation for two research permits (Gleason and Donahue). Communication between K. Maison and J. Rivera dated May 28, 2014.

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http://www.nmfs.noaa.gov/pr/pdfs/laws/esa_section7_handbook.pdf