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

July 13, 2012

Board of Land
and Natural Resources
Honolulu, Hawaii

Request for Authorization and Approval to Issue a Papahānaumokuākea Marine National Monument Research Permit to John Burns, University of Hawaii, Hawaii Institute of Marine Biology, for Access to State Waters to Conduct Coral Disease Survey 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 John Burns, University of Hawaii, Hawaii Institute of Marine Biology, 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 research 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 sites:

- Nihoa Island
- Necker Island
- French Frigate Shoals
- Gardner Pinnacles
- Maro Reef
- Laysan Island
- Lisianski Island, Neva Shoal
- Pearl and Hermes Atoll
- Kure Atoll

The activities covered under this permit would occur between July 15, 2012 and June 14, 2013.

The proposed coral reef disease survey activities are new activities.

INTENDED ACTIVITIES:

The purpose of these activities is to assess the health and community structure of shallow water coral reefs in order to improve the understanding of coral disease and disease dynamics throughout the Papahānaumokuākea Marine National Monument. Current studies repeatedly investigate the same colonies at permanent transect sites or use Rapid Ecological Assessment

survey techniques, which survey for multiple species of coral, algae, sponges and other organisms, and can only measure coral colony characteristics and presence or absence of disease. The proposed research activities would complement and expand upon these studies by providing population-level information of sites using a random survey design and transect methods which allow thorough assessment of diseased individuals, including spatial and temporal dynamics of reduced health states and disease, cofactors (species, colony size, depth) related to coral health, and measures of severity for each health affliction.

To conduct these activities, visual and photographic surveys of shallow-water (~15-80 ft) coral reef sites would be performed using traditional SCUBA. Sites would be randomly selected within or near those used by the annual Reef Assessment and Monitoring Program (RAMP). Two divers would deploy 25 m transects using a line-intercept method, whereby transect tape is placed following a pre-determined bearing and divers investigate all corals that are underneath the tape. This method allows the divers to spend ample time recording disease characteristics, such as colony size and severity of disease for each surveyed colony with a visible health affliction, and the survey method is nearly identical to those used by NOAA's Coral Reef Ecosystem Division (CRED). All colonies observed with disease characteristics would also be photographed. The tape would be deployed carefully placed above the substrate to ensure no harmful contact with any living corals or other organisms would take place. Divers would repeat the procedure so that two transect surveys would be completed for each dive site. All surveys would be visual only and no collections would be made. The analyzed data would then be used to determine comprehensive coral health parameters for each site surveyed, which could be cross-referenced with spatial and environmental data from other surveys.

The proposed activities relate directly to the Monument Management Plan (MMP) and are described in the Marine Conservation Science (MCS) Action Plan, Activity MCS-1.2 – Continue monitoring of shallow-water coral reef ecosystems to protect ecological activity: "Quantitative surveys of coral would be conducted annually using methods comparable to or inter-calibrated with those of existing historical data sets. The results of these activities would better define resource baselines for comparisons in protection and management efforts" (PMNM MMP Vol. 1, p. 123).

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

- ☒ 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 15th, 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 concerns were raised during the review process. The applicant's responses are noted below.

1. *The Applicant has checked the location box for "other." Please elaborate or explain why this box is checked.*

   The Applicant states that when he was completing the permit application, he was unsure as to what cruise, if any, he would obtain a berth on. He was also uncertain as to which locations the cruise would be visiting. Therefore, he checked all sites including 'other' just in case he received a berth on a cruise that may be visiting a site not listed on the Permit application. He states that the actual sites visited would be those planned by the RAMP cruise (HA-12-04) coordinator.

2. *Does the Applicant have a list of randomized locations that have been pre-selected (as noted in Procedures/Methods on page 11) where the surveys will take place? Do they over-lap or are they separate from other studies that are being conducted (such as RAMP) or the NMFS Coral Reef Ecosystem Division (CRED) sites?*

   The Applicant responds that random locations would be chosen within the sites used for RAMP and CRED surveys. There is potential for the Applicant to have an HIMB berth and due to limited space he would be teaming up with two other graduate students from HIMB working on separate projects. In order to facilitate everyone's needs, they would work together at sites where they all can complete their surveys. He states he is still uncertain of the exact locations that would be visited for the RAMP and CRED surveys. Once these locations are known, he would choose locations within these areas that would be reasonable for everyone on his team to complete their respective surveys.

3. *The Applicant states that he will be developing a "comprehensive epizootiological dataset," which is described as including the study of the causation of the disease. Does the Applicant plan on assessing causation of the diseases noted by using only visual studies or will this be completed by other methods?*

   The Applicant explains that epizootiology, the equivalent of epidemiology for animal diseases, is the study of the frequency, distribution, and causation of disease in an animal population. As the Reviewer points out, deciphering precise causation can be very difficult for diseases, especially ones with no known causative agents. The Applicant states he does not plan on directly examining causation, as this would require extensive laboratory tests using samples of diseased tissue and can be confounded by the unknown onset of disease signs. He instead plans on collecting as much information about the characteristics of corals

affected by signs of reduced health and disease. This would provide information about the frequency and distribution of observed coral health, as well as potentially elucidate cofactors of reduced health and disease. Determining cofactors is critical for discovering environmental and/or physical characteristics of corals that may drive the prevalence and severity of reduced health and disease.

4. *Recommend coordination with other coral disease researchers in PMNM (Dr. Stephen Karl and Dr. Greta Aeby) to minimize the impact of activities upon PMNM resources and to provide the greatest benefit to the Monument. For example, could the information on coral disease collected by these three groups be developed into a GIS map of coral disease within PMNM?*

   The Applicant states that he wholeheartedly agrees with this recommendation and plans to attempt collaborations with both these researchers as well as others who investigate coral health dynamics throughout the Hawaiian archipelago. He is currently working with several researchers to develop a 'Coral Health Atlas.' This is a website they are developing with our current EPSCoR project that presents data in a GIS-based framework. The 'Coral Health Atlas' would allow researchers to display results from coral health surveys at various study sites as well as environmental characteristics from each site/area. Their goal is to make survey results more accessible as well as visualized in the context of environmental characteristics. They hope this work will aid to decipher environmental characteristics, both marine and terrestrial, that drive the health of corals throughout the Hawaiian archipelago.

5. *The applicant does briefly offer a brief recognition in his application (page 10) that corals are a cultural and ecological resource. While this seemingly passing statement might not be an indicator of the applicant's demonstrated understanding of the cultural significance Native Hawaiians assign to coral as our eldest ancestor, it is a start and speaks to the hope that applicants can grow in their understanding of how the resources of Papahānaumokuākea are the foundation of our living culture once they have had the opportunity to experience this sacred place.*

   The Applicant responds that he appreciates this comment and feels honored to have the opportunity to work in such a sacred place. He has always found it fascinating that, according to the Kumulipo, the coral polyp was the first organism to be created in the Ocean. This shows a profound respect for corals as the foundation to our marine resources as well as ancestors that we must protect and care for. He has attempted to address this in his work, especially during outreach activities with K-12 students, in order to share this perspective that we must care for corals as though they are our Kūpuna because they truly are the foundation of our marine ecosystems. If we lose the corals we lose our valuable resources. The Applicant states that it is this belief that has driven him to study coral health and he hopes his work can serve to help protect and manage these organisms. He feels very fortunate to have the opportunity to experience the reefs of Papahānaumokuākea firsthand, and will do his best to use this opportunity to provide a benefit to the resources of this area.

**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 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 PAPAHĀNAUMOKUĀKEA MARINE NATIONAL MONUMENT RESEARCH PERMIT TO JOHN BURNS, UNIVERSITY OF HAWAII, HAWAII INSTITUTE OF MARINE BIOLOGY, FOR ACCESS TO STATE WATERS TO CONDUCT CORAL DISEASE SURVEY ACTIVITIES UNDER PERMIT PMNM-2012-031")

Has Applicant been granted a permit from the State in the past? Yes ☐ No ☒
If so, please summarize past permits: n/a

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 Applicant has properly demonstrated valid justifications for her application and should be allowed to enter the NWHI State waters and to 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 Applicant has 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

Based on the attached proposed declaration of exemption prepared by the department after consultation with and advice of those having jurisdiction and expertise for the proposed permit actions:

1. That the Board declare that the actions which are anticipated to be undertaken under this permit will have little or no significant effect on the environment and is therefore exempt from the preparation of an environmental assessment.

2. Upon the finding and adoption of the department's analysis by the Board, that the Board delegate and authorize the Chairperson to sign the declaration of exemption for purposes of recordkeeping requirements of Chapter 343, HRS, and Chapter 11-200, HAR.

3. That the Board authorize and approve a Research Permit to John Burns, University of Hawaii, Hawaii Institute of Marine Biology, with the following special conditions:

a. 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.

b. 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.

c. To prevent introduction of disease or the unintended transport of live organisms, the permittee must comply with the disease and transport protocol attached to this permit.

d. Tenders and small vessels must be equipped with engines that meet EPA emissions requirements.

e. 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 Marine Refuge.

f. No fishing is allowed in State Waters except as authorized under State law for subsistence, traditional and customary practices by Native Hawaiians.

Respectfully submitted,

GUY KAULUKUKUI
Acting 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:** John Burns
**Affiliation:** UH Manoa, Hawai'i Institue of Marine Biology (HIMB), UH Hilo, Friends of Papahanaumokuakea (PPO)

**Permit Category:** Research
**Proposed Activity Dates:** June 1 - September 30 2012 (specific dates TBD)
**Proposed Method of Entry (Vessel/Plane):** Vessel
**Proposed Locations:** (TBD, dependent on NOAA field cruise destinations)

**Estimated number of individuals (including Applicant) to be covered under this permit:** 4 (Dr. Ruth Gates, Dr. Misaki Takabayashi, Makani Gregg, and John Burns). Only 2 individuals will need to enter the Monument to perform field surveys.
**Estimated number of days in the Monument:** 25

**Description of proposed activities:** (complete these sentences):

a.) The proposed activity would…

Assess the health and community structure of corals on shallow-water reefs throughout the Papahānaumokuākea Marine National Monument. Our survey techniques will utilize a stratified random sampling approach to objectively survey the health of corals at multiple sites within the Monument. The resulting data will enable a comprehensive examination of coral health at large-spatial scales throughout the Monument.

b.) To accomplish this activity we would ….

Conduct surveys using SCUBA on shallow-water reefs to collect data on the health of corals. Detailed descriptions of the surveyed colonies and visible disease signs will be recorded. The resulting data will allow us to decipher important characteristics of reduced health states affecting corals in the Papahānaumokuākea Marine National Monument.

c.) This activity would help the Monument by …

Enabling a detailed analysis of coral health on shallow-water reefs of the Papahānaumokuākea Marine National Monument. Surveying at randomly chosen coordinates within each site will create a robust dataset for an objective analysis of the prevalence and severity of coral health afflictions. This data will be critical for tracking changes to coral health and ecosystem function in the face of increasing global stressors such as climate change and ocean acidification.

**Other information or background:** Our coral health survey methods have proved useful for determining the severity and prevalence of reduced health states and diseases. This research is critical for assessing the impacts of coral health afflictions to the overall health and function of shallow-water coral reef ecosystems. Utilizing an objective and randomized survey approach on reefs throughout the Papahānaumokuākea Marine National Monument will enhance the capability of tracking and monitoring the health of coral populations within this valuable ecosystem. Currently, coral health and disease is assessed using permanent monitoring sites and repeadetly observed colonies. This method has great utility for tracking disease progression and incidence rates, however the data is less useful for determing disease characteristics at the population level. Our methodology will improve the knowledge of coral health in the Monument by creating a robust dataset pertaining to large-scale population characteristics. Ultimately, this will provide useful information for managers such as; spatial and temporal dynamics of reduced health states and disease, cofactors (species, colony size, depth, etc.) related to coral health, and measures of severity for each observed health affliction.

## Section A - Applicant Information

**1. Applicant**

Name (last, first, middle initial): Burns, John, HR

Title: Ph.D. Candidate at UH Manoa

**1a. Intended field Principal Investigator (See instructions for more information):**
John HR Burns

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

Phone: [redacted]

Fax: [redacted]

Email: [redacted]

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

**3. Affiliation (institution/agency/organization directly related to the proposed project):**
HIMB, UH Manoa, UH Hilo, PPO

**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):**
1. John Burns, Research Diver & Co-Principle Investigator, PhD Candidate at UH Manoa
2. Makani Gregg, Research Diver, MS Candidate at UH Hilo, PPO member
3. Misaki Takabayashi, Backup Research Diver & Co-Principle Investigate, UH Hilo Faculty
4. Ruth Gates, Co-Principle Investigator, HIMB Faculty
5. Research Diver TBD (in case an additional diver is needed or another member is unable to dive)
**(Only two research divers will need to enter the Monument to collect data)

## Section B: Project Information

**5a. Project location(s):**

| | | Ocean Based | |
|---|---|---|---|
| ☒ Nihoa Island | ☐ Land-based | ☒ Shallow water | ☐ Deep water |
| ☒ Necker Island (Mokumanamana) | ☐ Land-based | ☒ Shallow water | ☐ Deep water |
| ☒ French Frigate Shoals | ☐ Land-based | ☒ Shallow water | ☐ Deep water |
| ☒ Gardner Pinnacles | ☐ Land-based | ☒ Shallow water | ☐ Deep water |
| ☒ Maro Reef | | | |
| ☒ Laysan Island | ☐ Land-based | ☒ Shallow water | ☐ Deep water |
| ☒ Lisianski Island, Neva Shoal | ☐ Land-based | ☒ Shallow water | ☐ Deep water |
| ☒ Pearl and Hermes Atoll | ☐ Land-based | ☒ Shallow water | ☐ Deep water |
| ☒ Midway Atoll | ☐ Land-based | ☒ Shallow water | ☐ Deep water |
| ☒ Kure Atoll | ☐ Land-based | ☒ Shallow water | ☐ Deep water |
| ☒ Other | | | |

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

Location Description:
All surveys will be conducted on coral reefs at sites determined by the NOAA PMNM research coordinators. The exact locations are still to be decided.

**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:***
The purpose of our proposed activities is to perform visual surveys to collect coral health data for shallow-water reefs throughout the Papahānaumokuākea Marine National Monument. This work is needed in order to monitor and track changes in coral health on reefs within this valuable and pristine ecosystem. Corals are the backbone of productive reef ecosystems throughout Hawai'i, as global changes affect marine environments it is important to track and quantify impacts imposed on coral reefs. Collecting coral health data at sites within the Papahānaumokuākea Marine National Monument will also allow for comparisons to sites within the Main Hawaiian Islands. Collectively this data will facilitate comprehensive analyses of coral health throughout Hawaiian waters. The proposed methods in this permit will complement and improve upon the current assessments of coral health that utilize permanent survey sites and repeatedly surveyed colonies. Our unique approach of conducting surveys using a stratified random design will develop a robust dataset on coral health dynamics throughout the Monument, this information will be useful for managers to determine areas of high disease prevalence and severity. Collecting data in this manner will improve the spatial resolution of our understanding of coral health. Furthermore, continuing these surveys over time will equip managers with the capability to temporally track the health of coral populations within the Monument.

**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?
Our research activities are conducted with relatively no impact to the reefs other than our presence. All data is collected visually using transect surveys and photographs. The only physical impact is the deployments of transect tape. Transects will be carefully deployed and placed above the substrate in a manner to ensure no harmful contact with any living corals or other organisms. No tape will be wrapped or anchored in any manner that could damage any living coral or substrate. The methods used to deploy transect tape are nearly identical to those used for CRED research activities and will have the same negligible impact on living substrate. Our research team has substantial experience conducting surveys in this manner and is adequately trained (please see diver qualification descriptions in Question #7-F) to avoid imposing any harmful affects on the benthic substrate.

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?
As stated above, our research activities have no detrimental impacts on the marine ecosystems within the Monument. The goal of collecting coral health data is to determine the impacts of deleterious health afflictions and provide management with information necessary for maintaining healthy coral reef ecosystems. Implementing our proposed survey approach,

utilizing random sampling design, will facilitate objective results at the population level. These results will allow managers to answer important questions about disease dynamics and patterns of coral health throughout the Monument. Our proposed methods will complement the annual Reef Assessment and Monitoring Program (RAMP) by providing more detailed data on coral health and disease. For instance, RAMP coral disease surveys utilize categorical variables for colony size and disease severity. Our methods utilize a Line Intercept Transect method, rather than Belt Transect, which gives divers necessary bottom time to measure each colony as well as visible lesions in order to record a direct quantitative measure of colony size and disease severity. Our methods also record more states of reduced health and disease, such as trematodiasis, tissue discoloration, hypermycosis, brown necrotizing disease, and multiple forms of algal growth (i.e. endolithic algal growth following tissue loss versus epilithic filamentous algae growing over coral tissue). Furthermore, we record extensive details of disease-related features such as colony morphology (branching, encrusting, etc.) and lesion descriptions proposed by Work and Aeby (2006, Diseases of Aquatic Organisms) in order to develop a comprehensive epizootiological (the study of the frequency, distribution, and causation of disease in an animal population; the counterpart in nonhuman animals of epidemiology) dataset. The resulting data enables a more thorough characterization of reduced coral health states and disease dynamics. Utilizing this epizootiological approach has enabled previous identification of environmental and biological parameters (disease cofactors) associated with disease severity (Burns and Takabayashi 2011). Combining epizootiological data with ecosystem characterization data collected throughout the Monument may provide critical insight into environmental cofactors associated with coral health. By sampling with a stratified random design we will obtain an objective assessment of coral health that will complement data collected from permanent survey sites and repeatedly surveyed colonies. Repeating surveys at the same location and on the same colonies has excellent use for determining factors such as rates of incidence, transmission, and progression. However, these methods provide less information relevant to disease parameters, such as prevalence and severity, at the population level due to a degree of bias created by repeatedly surveying the same area. Utilizing the random sampling design will develop a robust dataset that will enable an objective determination of coral health characteristics at the population level. Ultimately, the dataset will allow for multiple disease parameters to be analyzed, in addition to those collected with RAMP and other surveys, in order to improve the understanding of coral health and disease dynamics throughout 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.
It is important that these research activities be conducted as they are not invasive and will provide useful data for monitoring and assessing coral health within the Monument. There is no practicable alternative as the goal is to develop a robust dataset pertaining to coral health dynamics within the Monument itself. Our proposed survey methodology will complement and enhance the current coral health data being collected in the Monument. Utilizing a stratified random sampling design will provide a platform to determine general trends of coral health (prevalence and severity, spatial and temporal patterns, disease cofactors) at the population level. This will complement the surveys being conducted at repeatedly visited sites and be immensely useful for assessing coral health characteristics throughout the Monument. Furthermore, this work will enable for comparison to sites throughout the Hawaiian Islands.

d. How does the end value of the activity outweigh its adverse impacts on Monument cultural, natural and historic resources, qualities, and ecological integrity?
This data will be of great value for aiding management decisions and tracking changes in coral health across spatial and temporal scales. The end value of these activities will greatly outweigh the impacts since the survey methods are non-invasive and will have relatively no effect on the coral reef ecosystems. Conducting surveys at several sites within the Monument will enable assessment of disease dynamics at various spatial scales. All transect locations will be georeferenced to enable multiple post-hoc spatial analyses. This will allow for determining if spatial patterns of disease prevalence and severity exist within sites or throughout the Monument. For instance, we have found water motion to be a cofactor of growth anomaly severity in East Hawai'i (Burns et al. 2010); by spatially analyzing coral health data from the Monument we will be able to determine if certain areas are more prone to coral health afflictions. By collating data pertaining to site characteristics (i.e. benthic data, water quality data, fish data) with coral health data we can try and identify cofactors of various disease states. We can also perform spatially-based analyses, such as the nearest neighbor algorithm, to investigate if the prevalence of certain afflictions display patterns indicative of vector-borne disease transmission. While our proposed methods are more detailed than those conducted by RAMP surveys, certain basic parameters can still be combined to improve the spatial resolution of coral health data collected throughout the Monument. Data from the Monument can also be collated with data collected from the Main Hawaiian Islands to assess patterns in coral health across the Hawaiian archipelago. Furthermore, we can compare our findings with those collected from previous RAMP surveys to address changes in coral health over time. Continuing our surveys in the future will enable an even more robust temporal analysis, this may be very useful when investigating disease severity and can shed light on which health afflictions pose the largest "threat" to coral reefs within the Monument.

e. Explain how the duration of the activity is no longer than necessary to achieve its stated purpose.
The duration of our activities is dependent on the planned NOAA research cruises. We will use the allotted time efficiently to maximize our data collection, therefore needing no time outside that planned by the PMNM research coordinators.

f. Provide information demonstrating that you are qualified to conduct and complete the activity and mitigate any potential impacts resulting from its conduct.
Our research team, Ruth, Misaki, Makani and myself, have been conducting coral health surveys throughout Hawai'i for several years. Our work has resulted in multiple publications and presentations. Misaki and Makani have also previously conducted research in the Monument and are members of PPO. We have a solid respect for the cultural importance of this site and hope to do our best to collect data, in an un-invasive manner, that can aide management of this immensely valuable ecosystem. The following has been added to our permit application to help clarify our response and provide more detailed information: Makani, an MS student at UH Hilo, has been a student as well as team leader for the University of Hawai'i Quantitative Underwater Ecological Survey Techniques (QUEST) course and currently works on several large grant collaborations collecting coral health data using SCUBA from several sites throughout Hawai'i

Island. She is a lead scientific diver for the University of Hawai'i Diving Safety Program with an 80fsw depth rating and has completed NAUI Nitrox and Rescue Diver training. Miskai, a UH Hilo professor, is an instructor for QUEST as well as lead scientific diver for the University of Hawai'i Diving Safety Program with a 60fsw depth rating and has completed NAUI Nitrox training. Misaki has conducted coral surveys on reefs throughout Australia, while working at the University of Queensland and the University of Sydney, as well as reefs throughout the Hawaiian Islands. I myself, a PhD student at UH Manoa, am a graduate as well as an instructor for the QUEST program. I am lead scientific diver for the University of Hawai'i Diving Safety Program with a 130fsw depth rating and I have completed NAUI Nitrox and Rescue Diver training, I am also a certified fill station operator. Like Makani, I am also currently working on several large grant collaborations collecting coral health data using SCUBA from several sites throughout Hawai'i Island. Collectively our work has resulted in several coral health related publications and presentations that are listed below in our Permit Application as well as in my attached curriculum vitae.

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 research labs of Ruth (HIMB) and Misaki (UH Hilo Marine Science) are well funded by several grants and are equipped with all the analytical software necessary for disseminating the collected data. Due to the un-invasive nature of our survey methods we would be capable of mitigating any potential impacts if they occurred.

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 methods and procedures are designed to be un-invasive and as thorough as possible. We utilize a unique approach to assessing coral health and colony characteristics in order to decipher the dynamics of health afflictions at the population scale. As mentioned above, our surveys use quantitative and detailed methodology to create a comprehensive epizootiological dataset pertaining to coral health for all surveyed areas. We plan to assess and measure any and all forms of visible coral health afflictions present on surveyed corals within the Monument. Several parameters, such as disease prevalence and severity, can be collated with RAMP data to assess temporal changes in coral health. If we are fortunate to perform these surveys in the future, we will be able to comprehensively assess changes in coral health over time on surveyed reefs throughout the Monument. Georeferencing our survey areas allow for various spatial analyses to be employed to investigate disease dynamics within and between surveyed sites. Georeferencing the coral health data will also enable spatial comparisons to sites within the Main Hawaiian Islands. Incorporating terrestrial and marine parameters in the spatially analyses will have great utility for determining ecosystem characteristics associated with coral health. Furthermore, our research labs are currently investigating the biological implications of various coral diseases. Once we determine the impacts of these diseases at the organismal level our findings can be collated with disease severity data to quantify the impact and threat of various diseases at the population level within the Monument. Ultimately, this work will provide the Monument with a comprehensive and robust dataset pertaining to the health of shallow-water coral reefs. Corals are a cultural and ecological resource, providing critical habitat to a multitude of marine species.

It is important to determine disease cofactors and track health changes to avoid any large-scale mortality associated with outbreaks of disease.

i. Has your vessel has been outfitted with a mobile transceiver unit approved by OLE and complies with the requirements of Presidential Proclamation 8031?
Our work will be conducted in conjunction with the planned NOAA summer field cruises; we will therefore operate on NOAA vessels and be in compliance with all marine vessel requirements.

j. Demonstrate that there are no other factors that would make the issuance of a permit for the activity inappropriate.
As stated above, our surveys are visual and will have no detrimental impacts to the corals or the reef structures. We do not plan on taking any samples and will therefore have no adverse impact on the coral reefs.

**8. Procedures/Methods:**
Surveys will be conducted using SCUBA, transport to the sites will be facilitated by NOAA research vessels. Two divers will descend on the shallow-water coral reef sites (~15-80ft) chosen for surveys. Divers will deploy a 25m transect at a pre-determined location in the direction of a pre-determined bearing. Transect locations will be established by utilizing a random stratified sampling design in order to objectively survey all study sites. Working in unison, divers will investigate all corals underneath the deployed transect tape. Divers will record multiple parameters, such as colony size and severity (proportional surface area), for each surveyed colony and visible health affliction. All observed colonies will also be photographed to facilitate digital image analyses. Divers will repeat this procedure so two transect surveys can be completed for each dive. The analyzed data will be used to determine coral health dynamics (i.e. spatial, temporal, cofactors) for all surveyed reefs within the Monument.

**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:
N/A

Scientific name:

# & size of specimens:

Collection location:

☐ Whole Organism ☐ Partial Organism

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

**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?**
N/A

**11. Describe collaborative activities to share samples, reduce duplicative sampling, or duplicative research:**
We plan to collaborate with the Monument so all our coral health data can be archived and available when needed. The data collected by our proposed research activity will complement the coral health surveys presently being conducted at repeatedly observed sites. This will enable a more comprehensive understanding of disease characteristic (prevalence, severity, disease progression and incidence rates) at the population level across spatial scales throughout the Monument. The results of these combined studies will provide the Monument with useful data pertaining to the health of corals that can greatly aide management decisions in regards to coral reef health and function.

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

SCUBA gear (BCD, regulator, mask, fins, snorkels, weights, computers, compass, dive knife), slates, rulers, underwater cameras, transect tape.

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

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

**14. Provide a time line for sample analysis, data analysis, write-up and publication of information:**
Photo analyses, data analyses, a report write-up, and at least one publication will be completed within a year of the field surveys. We hope to complete several publications utilizing this coral health dataset within a few years of data collection.

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

☐ Burns JHR, Takabayashi M (2011) Histopathology of Growth Anomaly Affecting the Coral, Montipora capitata: Implications on Biological Functions and Population Viability. PLoS ONE 6(12): e28854

☐ Burns JHR, Rozet NK, Takabayashi M (2011) Morphology, severity, and distribution of growth anomalies in the coral, Montipora capitata, at Wal'ōpae, Hawai'i. Coral Reefs 30: 819-826

☐ Burns JHR (2011) Assessing the threat of growth anomalies on Hawaiian corals. Ka Pili Kai Spring Issue: 10

☐ Burns JHR (2010) It's not a tumor? Impacts of skeletal growth anomalies on Hawaiian corals. Ka Pili Kai Spring Issue: 6-7

☐ Takabayashi M, Gregg TM, Farah E, Burns J, Teves K, Cody NH (2010) The prevalence of skeletal growth anomaly and other afflictions in scleractinian coral at Wal'ōpae, Hawai'i. Proc 11th Int Coral Reef Symp 18: 820-824

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

John H. R. Burns
[redacted]
#

# CURRICULUM VITAE

## EDUCATION

- UNVERSITY OF HAWAII – Manoa, HI
  *Doctor of Philosophy, Zoology*
  2011-present

- UNIVERSITY OF HAWAII - Hilo, HI
  *Masters of Science, Tropical Conservation Biology and Environmental Science*
  2008-2010 (3.9/4.0 GPA)

- CALIFORNIA POLYTECHNIC STATE UNIVERSITY - San Luis Obispo, CA
  *Bachelor of Science, Biology. Concentration: Marine Biology and Fisheries*
  *Minor in Philosophy*
  2002 - 2007 (3.2/4.0 GPA)

## RESEARCH EXPERIENCE

- ACADEMIC RESEARCH AT UNIVERSITY OF HAWAII IN HILO 2008-2010
  Masters Thesis: Pathological and epizootiological investigation of skeletal growth anomalies affecting *Montipora capitata* corals in East Hawai'i
  - Developed lesion diagnostics based on coral micromorphology
  - Assessed disease severity and determined associated cofactors
  - Performed histopathological investigation of diseased coral tissue
  - Utilized pulse amplitude modulation fluorometry to analyze the effects of lesions on symbiotic dinoflagellate photophysiology

- ACADEMIC RESEARCH AT CAL POLY STATE UNIVERSITY 2007
  Senior Thesis II: Effects of ocean acidification on *S. Purpuratus* development
  - Designed experimental procedures to study the effects of decreased seawater pH on sea urchin development.
  - Assisted in laboratory and field-related research into sea urchin response to UVB radiation *in vitro* as well as *in situ*.
  - Learned proper techniques for collecting and maintaining live marine invertebrates

- ACADEMIC RESEARCH AT UNIVERSITY OF THE SOUTH PACIFIC 2006
  Senior Thesis I: Analysis of coral bleaching survey methods
  - Conducted comparative research on survey methods involved in monitoring coral bleaching.

- Assisted in development of protocols enabling collection of standardized coral health data between various sites.
- Studied tropical coral ecosystems and the various environmental stressors impacting corals.

**PUBLICATIONS**

- Burns JHR, Takabayashi M (2011) Histopathology of Growth Anomaly Affecting the Coral, Montipora capitata: Implications on Biological Functions and Population Viability. *PLoS ONE* 6(12): e28854

- Burns JHR, Rozet NK, Takabayashi M (2011) Morphology, severity, and distribution of growth anomalies in the coral, *Montipora capitata*, at Wai'ōpae, Hawai'i. *Coral Reefs* 30: 819-826

- Burns JHR (2011) Assessing the threat of growth anomalies on Hawaiian corals. *Ka Pili Kai* Spring Issue: 10

- Burns JHR (2010) It's not a tumor? Impacts of skeletal growth anomalies on Hawaiian corals. *Ka Pili Kai* Spring Issue: 6-7

- Takabayashi M, Gregg TM, Farah E, Burns J, Teves K, Cody NH (2010) The prevalence of skeletal growth anomaly and other afflictions in scleractinian coral at Wai'ōpae, Hawai'i. *Proc 11th Int Coral Reef Symp* 18: 820-824

**PRESENTATIONS AT SCIENTIFIC MEETINGS**

- Burns JHR, Rozet NK, Gregg TM, Takabayashi M (2011) Impacts of skeletal growth anomaly on organismal and population viability of the coral *Montipora capitata*. 2011 ASLO Aquatic Sciences Meeting (poster).

- Burns JHR (2010) Skeletal growth anomalies afflicting *Montipora capitata* corals. 2010 Annual TCBES Symposium (oral presentation-*honorable mention award).

- Burns JHR, Rozet NK, Gregg TM, Takabayashi M (2009) Skeletal growth anomalies afflicting *Montipora capitata* corals: An analysis of skeletal morphology and disease prevalence. 2009 Annual Meeting for the Western Society of Naturalists (oral presentation).

- Burns, JHR (2007). Coral Bleaching Survey Methods. Cal Poly College of science and Mathematics Student Research Conference (oral presentation).

- Burns JHR, Adams N (2007). Possible effects of ocean acidification on fertilization and development of the purple sea urchins, *Strongylocentrotus purpuratus*. 2007 Annual Meeting for the Western Society of Naturalists (poster).

## SKILLS

- Laboratory Work:
  - Experience with molecular lab techniques, histological techniques, and fluorometry/spectrometry.
- Computing and Data Analysis:
  - Proficient in both Mac and PC applications including Microsoft Office (all programs), ArcView GIS (ESRI), Minitab, S-Plus, R, CPCe, Image J, Adobe Photoshop, and Adobe Illustrator.
- Aquaculture:
  - Experience with flow-through seawater system function and maintenance as well as maintaining live marine invertebrate organisms.
- Fieldwork:
  - Familiar with multiple marine survey techniques (QUEST Graduate), *in situ* fluorometry, and YSI field instruments.
- Diving Certifications:
  - University of Hawaii Lead Scientific Diver.
    - 130 fsw depth authorization, Advanced open water diver (PADI), Rescue Diver (NAUI), Enriched Air Diver (NAUI), First Aid/CPR/$O_2$ Administration (DAN), trained on diver propulsion vehicles, authorized Fill Station Operator.

## TEACHING EXPERIENCE:

- Teaching Assistant for BIOL 265 at UH Manoa: Principles of ecology and evolution for life science majors stressing integrated approach and recent advance
- Course instructor for MARE 264 at UH Hilo: The application of commonly utilized nearshore underwater ecological surveying techniques using SCUBA. Intensive two-week course combining lecture and field work.
- Guest Lecturer for BIOL 495 at UH Hilo (x3): Lectures, discussions and research reports of topics in biology presented by faculty, students, and visiting scholars
- Guest Lecturer for Hawai'i Island Meaningful Outdoor Experiences for Students (HI-MOES): Program to support teachers on Hawai'i Island with meaningful outdoor research experiences for their students, while meeting Hawai'i Content and Performance Standards.

## SCIENTIFIC COURSES/WORKSHOPS ATTENDED

- Quantitative Underwater Ecological Survey Techniques (QUEST) – UH 2009
- Pan Pacific Coral Health and Disease Workshop – Kona, HI 2009
- Coral tissue slide reading workshop – MOTE Marine Laboratory 2009
- Diseases of corals and other reef organisms – MOTE Marine Laboratory 2009
- Light and photosynthesis on coral reefs – UNAM 2010

## PROFESSIONAL MEMBERSHIPS

- Western Society of Naturalists (WSN)
- American Society of Limnology and Oceanography (ASLO)
- American Academy of Underwater Sciences (AAUS)
- Divers Alert Network (DAN)
- Tri-Beta Science Club

## GRANTS AND FELLOWSHIPS

- NOAA Sea Grant Fellowship (2009-2011)
- Federal Pell Grant (2006-2007)
- Federal SMART-Senior Grant (2006-2007)
- State University Grant (2006-2007)

## PROFESSIONAL EXPERIENCE

RESEARCH CORPORATION OF THE UNIVERSITY OF HAWAII
UH HILO 2008-2011
*Research Assistant*

- Perform field and laboratory research involved in investigating skeletal growth anomalies afflicting *Montipora capitata* corals.
- Facilitate research trips to investigate benthic and water quality parameters at various study sites.

CENTER FOR COASTAL MARINE SCIENCES
CAL POLY STATE UNIVERSITY 2007-2008
*Instructional Support Technician I at Cal Poly Research Pier*

- Perform all biological and mechanical duties to maintain flowing seawater system and aquaria room.
- Assist in all maintenance duties involved in facilitating research activities at the Cal Poly pier.

CAL POLY FOUNDATION 2007-2008
*Research Assistant*

- Performed research into the affects of ocean acidification on sea urchin fertilization and embryo development.
- Assisted with molecular research into the effects of UVA and UVB on sea urchin fertilization and embryo development.

## LEADERSHIP AND VOLUNTEER WORK

- Outreach education with Nāwahīokalani□ōpu□u 2011
- Outreach education with Connections Charter School 2011
- Outreach education with Basic Image youth group 2011
- Volunteer for HIMB Community Education Program 2011

- Speaker at Hanauma Bay Educational Series 2009, 2010, 2011
- TCBES Graduate Student Committee 2009-2010
- Outreach education with Kua O Ka La Charter School 2010
- Earth Day Volunteer 2010
- Outreach education at SOEST Open House event 2009, 2011
- Ocean Day Outreach Committee 2009, 2011
- Counselor for Camping and Education Foundation 2004
- Habitat for Humanities, Portland Oregon 2002

**REFERENCES:**

- Dr. Misaki Takabayashi, Marine Science, Associate Professor at UH Hilo.
- Dr. Ruth Gates, Hawaii Institute of Marine Biology, Researcher
- Dr. Jim Beets, Marine Science, Associate Professor at UH Hilo.
- Dr. Darren Okimoto, UH Sea Grant College Program, Extension Faculty
- Dr. Nikki Adams, Biological Sciences, Associate Professor at Cal Poly.
- Tom Moylan, Cal Poly Pier Facilities Manager, Center for Coastal Marine Sciences

# 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):**
   - John Burns, Diver, HIMB, [redacted]
   - [redacted]Makani Gregg, Reserve Diver (will only enter monument if planned Diver is unable to go), UHH TCBES, [redacted]
   - [redacted]Dr. Misaki Takabayashi, Reserve Diver (will only enter monument if planned Diver is unable to go), UHH Marine Science, [redacted]

2. **Specific Site Location(s): (Attach copies of specific collection locations):**
   - Locations: French Frigate Shoals (FFS), Pearl and Hermes Reef (PHR), Kure Atoll (KUR), Lisianski (LIS)
   - Specific locations within each site will be determined by the cruise coordinator, please see attached excel spreadsheet with specific details regarding the itinerary

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

**3a. 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.** N/A

**4. Funding sources (Attach copies of your budget, specific to proposed activities under this permit and include funding sources. See instructions for more information):** There is currently no specific funding supporting this research. Equipment has already been purchased with previous Sea Grant and EPSCoR research funds. Salary of the diver will be supported by either CREST or RTRF funds.

**5. Time frame:**
Activity start: August 2012

Activity completion: N/A, we hope to continue conducting coral health surveys in the NWHI for any year possible if funding and logistics will permit it. Ultimately our goal is to collect data from multiple sites throughout the Hawaiian Archipelago and synthesize the information in the 'Coral Health Atlas' that we are currently developing.

Dates actively inside the Monument:
From: August 1st 2012
To: August 24th 2012

Describe any limiting factors in declaring specific dates of the proposed activity at the time of application: The tentative schedule is attached in an excel spreadsheet. The cruise coordinator will decide any changes.

Personnel schedule in the Monument: John Burns, Aug 1st – Aug 24th. No other personnel will be in the monument unless this Diver cannot go, then one of the reserve divers will go.

**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:** Divers are UH Scientific Divers and have DAN insurance to cover the expense for any search and rescue, evacuation, and/or removal of any persons. Please see attached PDF file for a copy of the DAN insurance card for John Burns.

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

X☐ Vessel
☐ Aircraft

Provide Vessel and Aircraft information: NOAA Ship Hi'ialakai R334

**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):**
We will be travelling on a NOAA Vessel and inspections will be ensured by the RAMP cruise coordinator.
☐ 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):**
N/A, we will be traveling aboard a NOAA vesselN
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#:

* 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: N/A, we will be travelling aboard a NOAA vessel

## Additional Information for Land Based Operations

**11. Proposed movement of personnel, gear, materials, and, if applicable, samples:** N/A, we have no planned land-based activities

**12. Room and board requirements on island:** N/A

**13. Work space needs:** N/A

DID YOU INCLUDE THESE?
X☐ Map(s) or GPS point(s) of Project Location(s), if applicable
N/A☐ Funding Proposal(s)
N/A☐ Funding and Award Documentation, if already received
X ☐ Documentation of Insurance, if already received
N/A☐ Documentation of Inspections
N/A☐ Documentation of all required Federal and State Permits or applications for permits

NEIL ABERCROMBIE
GOVERNOR OF HAWAII

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

GUY KAULUKUKUI
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

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
DIVISION OF AQUATIC RESOURCES
1151 PUNCHBOWL STREET, ROOM 330
HONOLULU, HAWAII 96813

July 13, 2012

TO: Division of Aquatic Resources File

THROUGH: William J. Aila, Jr., Chairperson

FROM: Guy Kaulukukui, First Deputy and Acting Administrator
Division of Aquatic Resources

SUBJECT:

DECLARATION OF EXEMPTION FROM THE PREPARATION OF AN ENVIRONMENTAL ASSESSMENT UNDER THE AUTHORITY OF CHAPTER 343, HRS, AND CHAPTER 11-200, HAR, FOR PAPAHĀNAUMOKUĀKEA MARINE NATIONAL MONUMENT RESEARCH PERMIT TO JOHN BURNS, UNIVERSITY OF HAWAII, HAWAII INSTITUTE OF MARINE BIOLOGY, FOR ACCESS TO STATE WATERS TO CONDUCT CORAL DISEASE SURVEY RESEARCH ACTIVITIES UNDER PERMIT PMNM-2012-031.

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 John Burns, University of Hawaii, Hawaii Institute of Marine Biology, for Access to State Waters to Conduct Coral Disease Survey Research Activities.

Permit Number: PMNM-2012-031.

Project Description:
The research permit, as described below, would allow entry and activities to occur in Papahānaumokuākea Marine National Monument (Monument), including state waters, from July 15, 2012 through July 14, 2013.

The Applicant proposes to conduct stratified, random transect surveys near existing long-term monitoring sites, to complement and expand upon data from coral disease surveys taking place at permanent sites, as well as data from the annual Reef Assessment and Monitoring Program (RAMP). Utilizing the random sampling design, as proposed by the Applicant, would develop a robust dataset that will enable an objective determination of coral health characteristics at the population level, and ultimately would allow for multiple disease parameters to be analyzed in

order to improve the understanding of coral health and disease dynamics throughout the Monument.

To conduct these activities, visual and photographic surveys of shallow-water (~15-80 ft) coral reef sites would be performed using traditional SCUBA. Two divers would deploy 25 m transects using a line-intercept method, whereby transect tape is placed following a pre-determined bearing and divers investigate all corals that are underneath the tape. The tape would be deployed carefully placed above the substrate to ensure no harmful contact with any living corals or other organisms would take place. No measurable impacts to Monument resources are anticipated, as the Applicant would not be collecting or removing living or non-living Monument resources.

The proposed activities would provide useful information to enhance the capability of tracking and monitoring the health of PMNM coral populations and 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 "monitor shallow-water coral reef ecosystems to protect ecological integrity."

Activities to support understanding and interpreting the NWHI, which could include monitoring of diseased coral, are addressed in the Monument Management Plan Environmental Assessment (December 2008) which resulted in a FONSI. This EA summarizes that understanding how populations change could be helpful to forecast, prepare for and mediate potential threats to populations within the Monument (PMNM MMP Vol 2, p.171). Disease monitoring, such as those activities 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). The Principal Investigator for this project, Greta Aeby, has also been consulted with respect to her experience in successfully conducting studies on coral and fish diseases. In addition, the permit application has been posted on the Monument Web site since March 15th, 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 § 11-200-8, HAR, including the criteria used to determine significance under § 11-200-12, HAR, 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 visual surveys and photography, 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. § 11-200-7, HAR. Since this permit involves an activity that is precedent to a later planned activity, i.e. continued surveys for coral disease, 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. §11-200-8(A)(5), HAR. specifically 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." This exemption class has been interpreted to include "surveys, censuses, inventories, studies, photographing, recording, sampling, collection, culture and captive propagation of aquatic biota", such as those being proposed.

The proposed collection activities here appear to fall squarely under the exemption class #5, exempt item #5 as described under the former Fish and Game Division exemption list published in January 19, 1976. As discussed below, no significant disturbance to any environmental resource is anticipated in the sampling of Monument resources. Thus, so long as the below considerations are met, an exemption class should include the action now contemplated.

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." § 11-200-8(B), HAR. 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. § 11-200-12, HAR. Examples of actions which commonly have a significant effect on the environment are listed under § 11-200-12, HAR.

A limited number of coral reef disease studies have been undertaken to date and mostly include surveys of coral disease at permanent sites (Aeby 2005, 2006, 2011). These studies have been instrumental both in identifying new diseases and documenting the spread and severity of a coral disease outbreak at these sites. NOAA RAMP surveys, which include rapid surveys of many different species of animals and algae, are able only to note the presence or absence of disease within coral colonies along transect lines. The activities proposed in the present study would be the first and only comprehensive disease study that would offer managers population-level disease information and characteristics. Further, these surveys would be visual only, with no collection of corals or other organisms. 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 the 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 activities would be conducted from the NOAA Ship HI'IALAKAI (PMNM-2012-009) during its August cruise. The following table lists additional activities that are anticipated to take place on this cruise pending approval of permit applications.

**Table 1. Concurrent Projects Aboard NOAA SHIP HI'IALAKAI.**

| Permit | Purpose and Scope | Location |
|---|---|---|
| PMNM-2012-009 Ellis | The permit allows NOAA Ship HI'IALAKAI entry into PMNM. Personnel aboard the vessel will be permitted under separate permits. | All locations |
| PMNM-2012-033 Donahue (proposed) | The proposed action is to allow collection of (dead) corals, and to retrieve and deploy coral settlement blocks. | All locations |
| PMNM-2012-034 Godwin (proposed) | The proposed action is to allow coral reef assessment and monitoring activities. | All locations |
| PMNM-2012-041 Winn-Kahng (proposed) | The proposed action is to allow water sampling collection activities. | All locations |
| PMNM-2012-028 Lemus (proposed) | The proposed action is to conduct filming activities and interviews with research scientists during the course of their field work. | All locations |

During the August cruise of the HI'IALAKAI, there is one other activity that includes coral reef surveys similar to what is proposed in the present study (Godwin, RAMP cruise, PMNM-2012-034), and should be considered when reviewing the proposed activities. The Applicant plans to utilize areas within selected RAMP survey sites for coral disease surveys, and therefore may overlap spatially. What distinguishes the two studies are that RAMP surveys use Rapid Ecological Assessments (REAs) of Belt Transects, which can quickly measure coral colony characteristics and multiple species of coral, algae, sponges and other organisms. The activities proposed by the Applicant would instead use Line-Intercept transects, which allow divers necessary bottom time to conduct a more comprehensive and coral-disease specific survey. The surveys by the Applicant would thus utilize, but also expand upon, the data collected by RAMP surveys, and therefore are complementary. The Donahue study (PMNM-2012-033) involves collections of (dead) corals and retrieving calcium carbonate settlement blocks at existing CRED sites, and

therefore may also spatially over-lap, but the nature of these two activities are very different. Lastly, the Applicant's proposed surveys are visual and photographic only, and do not involve any coral collections, and are therefore non-invasive by nature and should not have any impacts on the reefs. No other activities proposed during this research cruise involve surveys of shallow-water coral reef ecosystems in these sites.

The culmination of these permits, and their disparate activities, occurring throughout the Monument over a 4-week period, is not anticipated to have significant cumulative impacts. 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 research 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. No collections will be made, only visual and photographic surveys will be done. Visual coral surveys are non-invasive by nature and do not affect the ecological integrity of the coral reef ecosystem.

> 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.
Chairperson, Board of Land and Natural Resources

Date