

**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:  
NOAA/Inouye Regional Center  
NOS/ONMS/PMNM/Attn: Permit Coordinator  
1845 Wasp Blvd, Building 176  
Honolulu, HI 96818  
nwhipermit@noaa.gov  
PHONE: (808) 725-5800      FAX: (808) 455-3093

**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:** Carl G. Meyer

**Affiliation:** Hawaii Institute of Marine Biology

**Permit Category:** Research

**Proposed Activity Dates:** May 1st-Oct 30 2015

**Proposed Method of Entry (Vessel/Plane):** Vessel

**Proposed Locations:** Necker, Nihoa, French Frigate Shoals, Gardner Pinnacles, Maro Reef, Lisianski, Laysan, Pearl & Hermes Reef, Midway, Kure

**Estimated number of individuals (including Applicant) to be covered under this permit:** 8

**Estimated number of days in the Monument:** 70

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

a.) The proposed activity would...

Quantify the movements and trophic ecology of top predators (sharks and large fishes) in the Monument to: (1) improve our broad understanding of Monument ecology, (2) further elucidate the role of deep reefs in the ecology of Monument predators, and (3) enhance our understanding of food web dynamics in the Monument (4) enhance our understanding of the drivers of marine herbivory in the Monument and elsewhere.

b.) To accomplish this activity we would ....

Capture and equip top predators with electronic tags and small video cameras, and monitor their movements using acoustic receivers (deployed on the sea floor). Collect small, non-lethal tissue samples from top predators for chemical analysis to determine feeding habits. Collect reference isotopic samples from deep and shallow reefs by: (1) lethal sampling of up to 240 reef fishes (collected via 3-prong pole spear). These reference samples will be used to determine the trophic position and feeding location of predators, and clarify the foodweb baseline in Monument locations. (2) quantify digestive enzyme activity in herbivorous fishes along a latitudinal and vertical gradient. (3) assess digestability of algae between shallow and mesophotic reefs

c.) This activity would help the Monument by ...

Our research will provide Monument managers with information on the movements patterns and feeding habitats of culturally and ecologically important top predators, and clarify the relative contributions of herbivory and planktivory to Monument food webs supporting these predators. Our most recent published research suggests individual dietary specialization among predators, with individuals from the same species feeding on different prey types. We will be further investigating individual specialization in diet for sharks and ulua to provide managers with a more in-depth understanding of how top predators influence Monument food webs. We will also continue to provide new information on the importance of a poorly-understood habitat type (mesophotic deep reefs) in the Monument, to the ecology of top predators. Our research will also provide insight as to potential drivers of the presence of herbivorous fishes in the monument. Herbivores are abundant on some mesophotic reefs (e.g. FFS) but virtually absent on others (PHR), yet the reasons for these differences are unknown.

**Other information or background:**

Our research has minimal impact on monument resources. Sharks and other predators are captured, tagged and released at their capture locations. Our listening stations (acoustic receiver + moorings) are designed to have minimal substrate impact and leave nothing behind when they are removed. We are requesting to lethally sample no more than 240 individuals from the most common species of reef fishes.