

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: Christopher Kelley

Affiliation: Hawaii Undersea Research Laboratory, UH

Permit Category: Research

Proposed Activity Dates: March 7-April 11, and May 2-June 7, 2014

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

Proposed Locations:

Shallow water (50-150m) around: Nihoa, Twin Banks, Necker, St Rogatien Bank, W. St Rogatien Bank, Gardner Pinnacles, Maro Reef, Laysan, North Hampton Seamounts, Pioneer Bank, Bank 8 (Kilo Moana Seamount), Bank 9, Nero Seamount.

Deep water (>150m) around: Nihoa, Westpac Bank, Twin Banks, Keoia Seamount, Necker, French Frigate Shoals, Rogatien Banks (all), Gardner Pinnacles, Raita Bank, Maro Reef, Laysan, North Hampton Seamounts, Kaiuli Seamount, Pioneer Bank, Lisianski, Bank 8 (Kilo Moana Seamount), Bank 9, Pearl & Hermes, Ladd Seamount, Gambia Shoal, Midway, Nero Seamount, Kure, Wentworth Seamount, Woollard Seamount, Turnif Seamount, Bank 10 (Academician Berg Seamount), and several un-named seamounts

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

24

Estimated number of days in the Monument: 72

Description of proposed activities: (complete these sentences):

a.) The proposed activity would...
map the seafloor of the monument using multibeam sonar and simultaneously collect both gravity and magnetic field data.

b.) To accomplish this activity we would

These two 36 day cruises will attempt to map as much of the presently unmapped seafloor in the monument as possible using the Schmidt Ocean Institute vessel, R/V Falkor, and their Simrad EM 302 and 710 multibeam sonar mapping systems. The mapping plan has several focus areas that include seamounts and rift zone ridges, drowned reef terraces around Gardner Pinnacles, the mesophotic zone (50-150 m), completing the coverage of the ridge east of French Frigate Shoals (an important site for internal tide generation), and filling as many of the monument data gaps as possible above 3000 m depth. We will also use a gravimeter installed inside the ship's hull to passively collect gravity data and will tow a magnetometer 150 ft behind the ship to passively collect data on the magnetic field in the monument waters.

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

The acquisition of high-resolution seafloor mapping data is an essential precursor to making significant biological, geological, and oceanographic discoveries in the monument. To date, four dedicated mapping cruises have taken place in the monument (Kilo Moana 0206, Hi'ialakai 0501, 0508, and 0610). The first, which took place in 2002, was the only major one (Evans et al., 2004), a fact that has clearly restricted the pace by which discoveries are being made. Subsequent mapping that also took place on fishery and submersible cruises over the past ten years have added to the existing multibeam coverage during transits and in areas of specific interest. Even so, only 48% of the 366,631 km² of monument waters have been mapped, much of it as simple transit lines by a multitude of ships, and with the different mapping systems yielding data of varying quality. Approximately 190,000 km² of monument waters are yet to be mapped, which does not include the lower quality transit data, some of which should be re-mapped.

The acquisition of gravity and magnetics data are intended to gain a greater understanding of the geologic history of the monument and more broadly the entire Hawaiian Archipelago. This activity was added on at the last moment once it was certain we would have the funding for the instruments. Because many volcanoes in the archipelago are covered with old reef structures, their centers and shapes are masked under layers of carbonate. The gravimeter data will allow researchers to determine exactly where the original volcano is located under these secondary layers. They will help answer whether large platforms such as those of Gardner and the Rogatiens were created from one volcano or more than one volcano whose flows overlapped. The magnetics data will be used to obtain more accurate ages of the volcanos in the monument and will furthermore help determine which are of Hawaiian hotspot origin and which are not, the latter being Cretaceous (i.e., > 60 million years) and having rafted to the vicinity of the archipelago on the Pacific plate.

These data are both expensive and difficult to acquire in remote regions such as PMNM, generally costing upwards of \$35,000/day. The cost of each cruise is estimated to exceed \$2 million, of which the monument will be paying for only [REDACTED] through NOAA's Office of National Marine Sanctuaries.

Other information or background:

The research involves non-invasive sonar, gravimeter, and magnetometer surveys that will neither remove nor add anything to the monument waters. The multibeam systems on the R/V Falkor are new and have only recently been used on cruises in the Atlantic and along the west coast. The data from these systems have been found to be of outstanding quality. The

Section A - Applicant Information

1. Applicant

Name (last, first, middle initial): Kelley, Christopher, D

Title: Program Biologist for HURL

1a. Intended field Principal Investigator (See instructions for more information):

Christopher Kelley

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

[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]

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

3. Affiliation (institution/agency/organization directly related to the proposed project):

Hawaii Undersea Research laboratory, University of Hawaii

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):

John R Smith, Multibeam processing team, [REDACTED]
[REDACTED]

Joyce Miller, Multibeam processing team, [REDACTED]
[REDACTED]

Randall Kosaki, Multibeam watch stand team, [REDACTED]
[REDACTED]

Daniel Wagner, Multibeam watch stand team, [REDACTED]
[REDACTED]

Belinda Dechnik, Multibeam watch stand team, [REDACTED]
[REDACTED]
[REDACTED]

Jeremy Taylor, Multibeam processing team, [REDACTED]
[REDACTED]
[REDACTED]

Frances Lichowski, Multibeam processing team, [REDACTED]
[REDACTED]
[REDACTED]

Rachel Orange, Multibeam watch stand team, [REDACTED]
[REDACTED]

Jonathan Tree, Multibeam water stand & processing team, [REDACTED]
[REDACTED]

Brian Boston, Multibeam watch and processing teams, [REDACTED]
[REDACTED]

Kim Binsted, Multibeam watch and processing teams, [REDACTED]
[REDACTED]

Brian Shiro, Multibeam watch and processing teams, [REDACTED]
[REDACTED]

Harrison Togia, Multibeam watch and processing teams, [REDACTED]
[REDACTED]

Alex Rice, Multibeam watch and processing teams, [REDACTED]
[REDACTED]

Katie Taladay, Multibeam watch and processing teams, [REDACTED]
[REDACTED]

Lauren Harrison, Multibeam watch and processing teams, [REDACTED]
[REDACTED]
[REDACTED]

Shellie Linn Habel, Multibeam watch and processing teams, [REDACTED]
[REDACTED]

Anne Madhavi Patterson, Multibeam watch and processing teams, [REDACTED]
[REDACTED]

Stephanie Jane Duce, Multibeam watch and processing teams, [REDACTED]
[REDACTED]

Nicky Margaret Wright, Multibeam watch and processing teams, [REDACTED]
[REDACTED]

Additional Multibeam watch stand and processing team members TBD.

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

Ocean Based

Remaining ashore on any island or atoll (with the exception of Midway & Kure Atolls and Field Camp staff on other islands/atolls) between sunset and sunrise.

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

Location Description:

Shallowest mapping depth will be 50m around Necker, Gardner Pinnacles, and Laysan. All other mapping will take place in depths greater than 150m.

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 overarching goal of the project is the complete mapping of the monument's seafloor. A significant amount of that goal will be realized during these two 36 day cruises. Of particular note are the syntheses that will be created from this project by merging the new data with existing data collected on previous cruises. These syntheses will better define existing features and locate new ones to inspire ideas for future research projects, and as a guide of existing coverage that could be shared and updated. They will generate interest for other uses such as physical oceanographic modeling of internal tides, investigation of reef evolution, subsidence and sea level changes using fossil reef terraces, and identify geological features such as seamounts and rift zone ridges that likely harbor extensive biological communities.

*Considering the purpose of the proposed activities, do you intend to film / photograph federally protected species? Yes No

For a list of terrestrial species protected under the Endangered Species Act visit:

<http://www.fws.gov/angered/>

For a list of marine species protected under the Endangered Species Act visit:

<http://www.nmfs.noaa.gov/pr/species/esa/>

For information about species protected under the Marine Mammal Protection Act visit:

<http://www.nmfs.noaa.gov/pr/laws/mmpa/>

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?

This project only involves multibeam mapping sonar and collecting gravity and magnetic data, therefore will have no effect on the cultural, natural, and historic resources and ecological integrity of the monument. Multibeam mapping has already taken place in the monument with no detected effects on the monument resources. The majority of the mapping will take place in deep water and at considerable distance from emergent land. The RV Falkor's two multibeam systems use 30 kHz and 70-100 kHz frequencies. These frequencies have not been directly attributed to mammal strandings. The higher frequency Kongsberg EM710 system should be virtually inaudible to nearly all cetaceans species while the frequency of the Kongsberg EM302 system is at the very upper limit of the optimal range for many species. Both of the Falkor's multibeam systems have a special flexible "soft start" mode which are used

when entering areas of known cetacean activity. The soft start mode is a delay function, starting the sonar transmissions at a low output level and then gradually increasing to the level required for optimal bathymetry data collection. The soft start modes can either be set at -10 or -20 decibels with a 0 to 15 minute ramp up time to the desired power. We can select -10 dB, -20 dB or maximum transmit power. Maximum transmit power is recommended by Kongsberg for maximizing the mapping swath coverage. In the deepest operating mode the EM302 is 237 dB while the EM710 is 229 dB. When operating in shallow modes the decibels are 232 dB and 225 dB respectfully. The multibeam systems can also be operated with less than maximum power if required. We believe that the Falkor's multibeam systems pose minimal risk to cetaceans in the Monument. Both multibeam systems will be turned on before the ship enters into the Monument and will remain on for the duration of the mapping cruise as a precautionary measure to avoid possible startling of the animals. In addition to utilizing the systems' soft start operating modes we will create a plan whereby as much of the shallow water mapping as possible will be conducted during daylight hours. Observers in the Falkor's bridge, or on the mammal observation deck, will be on the lookout for the presence of cetaceans in the vicinity of the ship. If cetaceans are spotted ahead along the track the ship will stop and wait for the animals to pass. The following are specifications for the two multibeam systems that will be used during this project:

The specifications of the Kongsberg EM302 system are:

Operating frequency	30 kHz
Depth range	10-7000 m
Swath width	5.5xDepth, to approx 8 km
Pulse forms.....	CW and FM chirp
Swath profiles per ping	1 or 2
Motion compensation:	
- Yaw	± 10 degrees
- Pitch	± 10 degrees
- Roll	± 15 degrees
Sounding pattern	Equi-distant /equiangular
Depth resolution of soundings	1 cm
High resolution mode	High Density processing
Sidelobe suppression	> 25 dB
Suppression of sounding artefacts.....	9 frequency coded transmit sectors
Beam focusing	On transmit (per sector) and on reception (dynamic)
Beamforming method	Time delay
Gain control	Automatic
Swath width control	Manual or automatic, soundings intact when reduced swath width
Seabed imagery/sidescan sonar image	Standard
Water column display.....	Standard
Mammal protection	Standard
Multi frequency operation	Yes, by integration with EM 3002 and/or EM 710
Sub bottom profiling	Yes, by integration with SBP 300
Transmit array (deg).....	150 x 1

Recevei array (deg).....	1 x 30
Number of beams per swath.....	288
Maximum number of sounding per swath.....	432
Maximum number of swaths per ping.....	2
Maximum number of soundings per ping.....	864

The specifications of the Kongsberg EM710 system are:

Frequency range.....	70 to 100 kHz
Max ping rate.....	30 Hz
Swath coverage sector.....	Up to 140 degrees
Min depth.....	3 m below transducer
Max depth.....	2000 m
CW transmit pulses.....	0.2 to 2 ms
FW sweep pulse.....	Max 120 ms
Roll stabilized beams.....	Yes, ±15°
Pitch stabilized beams.....	Yes, ±10°
Yaw stabilized beams.....	Yes, ±10°
Sounding patterns.....	Equiangular, Equidistant, High Density
Mammal protection	Standard
Max number of soundings per ping.....	800

The multibeam mapping activity is planned to occur around-the-clock. To reiterate, while operating during periods of darkness and when entering all areas of the monument the multibeam systems' "soft start" mode will be utilized. The sonar transmissions will start at a low output level and then gradually increasing to the level required for optimal bathymetry data collection. Furthermore, we will try as much as possible to work further offshore at night. It is our understanding that the only report of a whale grounding event that could possibly have been caused by multibeam mapping took place close to shore, where the animals may have been startled by a sudden full start of the system. They made a wrong turn, wound up in a lagoon system that they were unable to find their way out of. Using a soft start mode, if and when the systems need to be turned on and off, and conducting most if not all mapping activities at night well offshore should ensure that our activities do not result in a similar incident.

With respect to the gravimeter and magnetometer, the former is being leased for the duration of the cruise. Once it arrives, it will be installed inside the hull of the ship and will never come in contact with monument waters. It will be turned on as soon as the ship departs Honolulu Harbor and will be left on throughout the duration of the cruise. It is only a passive data collector that does not emit anything and therefore will have absolutely no impact on the monument resources. The magnetometer is a similar device in the sense that it is also a passive data collector that does not emit anything that could potentially effect the monument resources. However, unlike the gravimeter, the magnetometer is a tow fish connected to a cable fastened to the ship. The tow fish is a cylinder, approximately 49 inches in length, 5 inch in diameter, weighing about 35 lbs that measures very subtle variations in the strength of the Earth's magnetic field.

While it could be operated on the ship, the ship itself creates a noisy magnetic field environment that interferes with the more subtle signal of the Earth it aims to detect. Therefore it is towed some 150 ft behind the ship, and about 5 meters below the surface. It imposes a negligible disturbance to the water column and certainly much less than the ship itself.

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?

We are aware of the significance and cultural importance of the NWHI to Native Hawaiians. As a sacred place, and especially in the realm of Po (beyond Mokumanamana), our hope is to tread lightly and leave no footprint from our activities. Recognizing that natural resources are, in fact, cultural resources for Native Hawaiians, it is our hope that the information and data generated by this project will assist PMNM by providing a base map which may then be populated with what is known about the rich and unique biological resources of this region. This knowledge will contribute directly to the documentation of these natural/cultural resources, and it is this understanding that allows for enhanced protection of these resources. No specimen collections are requested under this permit, and all proposed activities are non-invasive. Thus, there are no anticipated impacts to the cultural resources or the integrity of NWHI ecosystems. We believe this proposed activity is consistent with the spirit of Proclamation 8031, and specifically with Finding 1.b.

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.

Multibeam sonar mapping is the current state of the art technique used to map in depths below 50m. No better alternative methods exist to acquire high resolution imagery of the seafloor. A major objective of the project is to benefit the management of the monument by revealing the nature of the seafloor within its boundaries. Of the many individual islands, seamounts, atolls, ancient volcanic ridges, isolated pinnacles, and submerged banks within and crossing the PMNM boundaries, some are delineated only by the low resolution global dataset, others are sparsely mapped with just postage stamp-sized dive site summit surveys over them, while numerous other features are simply incomplete in coverage with gaping holes. Much of the existing data came from the transit swaths of opportunity which lack quality, resolution, and the proper acquisition orientation for the features being surveyed. In addition, the sidescan backscatter component is missing from many of the older systems. The project will result in new higher quality data useful to both the monument and to ongoing research efforts. There is no other way to acquire the gravity and magnetics data than with the use of the gravimeter and magnetometer.

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

The information gathered will directly contribute to a better understanding of marine habitats and geologic history of the NWHI, thereby improving our understanding of NWHI habitats and ecosystems. The potential value of this information on previously unmapped habitats is tremendous. As noted in 7.b. (above), there are no anticipated impacts to PMNM cultural, natural, or historic resources. No specimens will be collected, no project gear will touch the benthos, and no shore access is required. In our estimation, the end value of this activity far outweighs any potential impacts (which are assumed to be negligible/nonexistent), thus meeting the criteria noted under Finding 1.d. in Proclamation 8031.

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

Even with 72 ship days, this project cannot complete the huge task of mapping the entire seafloor within the monument boundaries. However, this is long enough to map most of the seamounts and much of the volcanic platforms of the islands and therefore will provide a significant contribution to achieving the task.

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

I have been the Principal Investigator and Chief Scientist of numerous multibeam mapping cruises within the main Hawaiian Islands and therefore am very experienced in planning and executing this type of project. I have furthermore assembled a very competent team who likewise have considerable experience in collecting and processing multibeam sonar data. Among them is Dr. John Smith who was the chief scientist on the first and most significant mapping cruise that has taken place within the monument to date. I also have considerable experience in working with multibeam data in ArcGIS software, have been contracted to produce numerous GIS projects for both government and private entities, and am currently working on a project for the dean of SOEST at UH that involves merging multibeam backscatter data for the entire main islands. I have also been the PI and chief scientist for other cruises in the monument since 2000 and am familiar with the permit process and need to minimize impacts to the monument resources.

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 Schmidt Ocean Institute (SOI) has agreed to provide the ship, the multibeam systems, and their own multibeam technicians required for this cruise. This was a result of a competitive grant process directly from SOI. I have requested the monument provide ████████ of salary support for three of the participants, John Smith, Joyce Miller, and myself, which the University of Hawaii required. This has been approved and the funds are currently in process to be passed from NOAA's Office of National Marine Sanctuaries to UH. NSF will be providing funding for the lease of the gravimeter from the Woods Hole Oceanographic Institute and to cover 4 stipends for students participating on the second leg of the cruise. All other participants have agreed to arrange for their own salary and travel support through their respective employers.

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.

Multibeam mapping is the state of the art technique for mapping seafloor deeper than 50m. The Falkor multibeam systems are the most up to date systems being produced and sold by SIMRAD. The magnetometer and gravimeter are the standard instruments used to collect these types of data.

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

No, but arrangements have been made to borrow a transceiver from the monument and install it on the Falkor when it arrives in the Hawaiian Islands later this fall.

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

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

8. Procedures/Methods:

A complete track plan of all of the survey lines will be created and installed into the ship's navigation computers and multibeam systems. All data from previous cruises will also be incorporated into their real time multibeam displays to provide guides for minimizing seams between old and new data. The survey lines will be numbered in the order in which they should be done and the ship will run each line at 7 nm/hr.

Multibeam mapping and collecting gravity and magnetics data are carried out around the clock and as a result, participants will man the processing and watch stand computers in two person teams for 8 hr shifts. The processing teams hope to finish with all or almost all of the data processing prior to the ship returning to Honolulu Harbor. Whatever raw data remains will be processed back in port as quickly as possible. A synthesis of the old and new data will be created by the PI after the cruises.

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:

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?

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

We have assembled all of the existing multibeam data for the monument and have created a mapping plan that avoids duplication, except where the previous data is of poor quality and the area is interesting enough to redo. Regarding future mapping work in the monument, Schmidt Ocean Institute requires that the data be made available immediately after we have finished processing it. They also require that it be distributed as widely as possible. This should ensure that there will be no duplication of this research in the future. The monument (specifically the Data Integration Group

Coordinator, Mr. David Graham) will receive a copy of all raw and processed data including syntheses with existing data on an external drive.

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

SIMRAD EM 302 and 710 multibeam sonar systems and sound velocity profilers for calibrating the systems at different locations within the monument.

12b. List all Hazardous Materials you propose to take to and use within the Monument:
none

13. Describe any fixed installations and instrumentation proposed to be set in the Monument:
none

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

Every effort will be made to complete the data processing by the end of the cruises. Once that is completed, the data products will be distributed to the monument, UH-SOEST, SOI, MBARI, and other interested parties for publication on their websites.

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

Kelley, C.; R. Moffitt; & J.R. Smith. 2006. Description of bottomfish essential fish habitat on four banks in the Northwestern Hawaiian Islands. Atoll Research Bulletin. No. 543, 319-332. (Note: utilized multibeam sonar mapping data from the monument)

Kelley, C. & W. Ikehara. 2006. The impacts of bottomfishing on Raita and West St. Rogatien Banks in the Northwestern Hawaiian Islands. Atoll Research Bulletin. No. 543, 305-318. (Note: utilized multibeam sonar mapping data from the monument)

Miller, J.E., S. Vogt, R. Hoeke, S. Ferguson, B. Appelgate, J.R. Smith, and M. Parke, Bathymetric Atlas and Website for the Northwestern Hawaiian Islands, Atoll Research Bulletin, 543, p. 409-422, 2006.

Evans, B.K., J.R. Smith, J.E. Miller, Collaborative Nautical Charting and Scientific Seabed Mapping Missions: NOAA and the University of Hawaii Conduct a Case Study in the Northwestern Hawaiian Islands, Sea Technology, v. 45, no. 6, pp. 14-22, (2004).

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