Papahānaumokuākea Marine National Monument
SPECIAL OCEAN USE 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.

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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
nwhipermiit@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 – Special Ocean Use
OMB Control # 0648-0548
Page 2 of 17

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: Agustines, Ariana S.
Affiliation: Large Marine Vertebrates Research Institute Philippines

Permit Category: Special Ocean Use
Proposed Activity Dates: Up to ~23 days between August-October 2022
Proposed Method of Entry (Vessel/Plane): Vessel (E/V Nautilus)
Proposed Locations: Shallow water (<100m) within original PMNM boundary; TBD - French Frigate Shoal, Maro Reef, Laysan Island. Final locations will be determined based on sea state and weather conditions at the time of the expedition.

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

A maximum of twenty-three individuals per expedition - including one or more NGS research teams, citizen scientists, a Native Hawaiian Liaison (identified in coordination with the Monument’s Cultural Working Group), and dive support specialists - will be covered by National Geographic Society Expedition Sponsor Program permits.

Across all five expeditions a maximum of 107 people will be covered by National Geographic permits.

Estimated number of days in the Monument:

National Geographic Society will be participating in five expeditions in the Monument over a 72 day period. We anticipate that the duration of this project will be approximately 15 -23 days.

Description of proposed activities: (complete these sentences):

a.) The proposed activity would…

…provide a quantification of elasmobranch (sharks and rays, hereafter called ‘sharks’) diversity and relative abundance at three localities within Papahānaumokuākea Marine National
Monument (PMNM), and create educational resources for advancing shark conservation through a multi-disciplinary approach combining traditional local knowledge with scientific tools and technology, primarily baited remote underwater video systems (BRUVs) and artificial intelligence (AI) image recognition tool. The data can inform an assessment of the Monument’s effectiveness in conserving these globally threatened species as well as provide a comparative analysis with previous studies conducted within the Monument to determine trends and status of shark populations. All of this work will be documented and shared through various outreach products, including live programming broadcast from onboard the Nautilus, which would include imagery and footage gathered underwater, from the surface, and above using a drone. Drone footage will be recorded only over water, never over land, carefully following FAA drone guidelines as well as guidelines from the Monument.

b.) To accomplish this activity we would …

…connect and collaborate with local communities and organizations to help refine research questions aligned with local interest and identify historically significant and culturally relevant sites for sharks. Video footage from BRUVs will allow us to capture the presence and diversity of shark species, count their abundance at different habitat types, and document novel interaction or behavioral displays among species. The AI tool will assist in post-process analysis of the recorded footage, maximizing efficiency in recognition and identification of shark species. Water samples will be taken for eDNA analysis to cross-analyze with BRUV footage and further assist in the presence of shark species. Lastly, outreach products will create learning opportunities about the Monument’s environment and cultural significance for audiences worldwide.

c.) This activity would help the Monument by …

…improving our understanding of shark populations within PMNM and filling the knowledge gaps in our understanding of how marine protected areas closed off to fishing and other human pressures affect shark diversity and abundance-data which is important for the current and future management of PMNM.

Other information or background:

The National Geographic Society is a global nonprofit that uses the power of science, exploration, education, and storytelling to illuminate the wonder of our world. For more than 130 years, the Society has identified and funded trailblazing scientists, researchers, conservationists, storytellers, and educators—known as National Geographic Explorers—from around the world who are working to better understand our world and everything in it.

To expand this work to help safeguard the world’s ocean, the National Geographic Society is partnering with Ocean Exploration Trust from August — October 2022 by leveraging their ship, the E/V Nautilus, to conduct five research expeditions led by National Geographic Explorers in Papahānaumokuākea Marine National Monument. The Society has submitted permit
applications for five distinct research projects, which together form the “National Geographic Society Expedition Sponsor Program.” Some of the five NGS expeditions will include multiple NGS research teams, and some of the NGS research teams will join multiple expeditions. During the period when the NGS teams are onboard, Ocean Exploration Trust will simultaneously be conducting seafloor mapping surveys funded by NOAA Ocean Exploration, focusing on areas that have not previously been mapped at high resolution.

In addition to the identified Explorers who will conduct work on the ship, each expedition will be joined by a number of citizen scientist participants. These individuals will join each expedition and participate in the scientific projects through daily citizen science activities through which they will assist in collecting data and conducting analysis under the guidance of the National Geographic Explorers leading each project. Citizen science activities will include participating in photo documentation and data collection while snorkeling, supporting species identification, participating in educator engagement, and contributing to a digital multimedia mosaic. Different citizen scientists will join each expedition.

Each expedition will also be joined by a Native Hawaiian Liaison, identified in collaboration with the Monument’s Cultural Working Group. We anticipate that there will be a different Liaison on each of the five expeditions.
Papahānaumokuākea Marine National Monument
SPECIAL OCEAN USE Permit Application

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Summary Information

Applicant Name: Justin Dunnavant, PhD
Affiliation: Assistant Professor of Anthropology and Archeology, University of California, Los Angeles

Permit Category: Special Ocean Use
Proposed Activity Dates: Up to ~23 days between August and October 2022
Proposed Method of Entry (Vessel/Plane): Vessel (E/V Nautilus)
Proposed Locations: Shallow water (<100m) within original PMNM boundary; French Frigate Shoals, Maro Reef.

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

A maximum of twenty-three individuals per expedition - including one or more NGS research teams, citizen scientists, a Native Hawaiian Liaison (identified in coordination with the Monument’s Cultural Working Group), and dive support specialists - will be covered by National Geographic Society Expedition Sponsor Program permits.

Across all five expeditions a maximum of 107 people will be covered by National Geographic permits.

Estimated number of days in the Monument:

The five National Geographic Society expeditions will take place over a 72 day period. We anticipate that the duration of this project will be approximately 15 -23 days.

Description of proposed activities: (complete these sentences):

a.) The proposed activity would…

…document cultural heritage sites within the Papahānaumokuākea Marine National Monument (PMNM) using the latest in 3D photogrammetric technology. Our diverse team of archaeologists, underwater photographers, and educators will bring this project to life in a
manner that ensures the highest level of scientific rigor, compelling educational materials, and data sovereignty in alignment with Hawaiian views.

b.) To accomplish this activity we would…

... create 3D virtual recreations of key heritage sites to raise awareness of the PMNM’s cultural significance and create curriculum that can be implemented in local and national classrooms across primary and post-secondary education.

c.) This activity would help the Monument by…

... bringing awareness to the rich history of the Monument documenting the various cultural heritage sites. Within the PMNM there are material artifacts and cultural sites that span millennia and speak to histories across Asia, North America and Hawaii. This project is particularly important because it provides local Hawaiians and the wider community with access to a cultural landmark that few people are able to visit. We intend for this project to excite further research and inquiry into PMNM and Hawaii’s vast submerged cultural resources.

Other information or background:

The National Geographic Society is a global nonprofit that uses the power of science, exploration, education, and storytelling to illuminate the wonder of our world. For more than 130 years, the Society has identified and funded trailblazing scientists, researchers, conservationists, storytellers, and educators—known as National Geographic Explorers—from around the world who are working to better understand our world and everything in it.

To expand this work to help safeguard the world’s ocean, the National Geographic Society is partnering with Ocean Exploration Trust from August — October 2022 by leveraging their ship, the E/V Nautilus, to conduct five research expeditions led by National Geographic Explorers in Papahānaumokuākea Marine National Monument. The Society has submitted permit applications for five distinct research projects, which together form the “National Geographic Society Expedition Sponsor Program.” Some of the five NGS expeditions will include multiple NGS research teams, and some of the NGS research teams will join multiple expeditions. During the period when the NGS teams are onboard, Ocean Exploration Trust will simultaneously be conducting seafloor mapping surveys funded by NOAA Ocean Exploration, focusing on areas that have not previously been mapped at high resolution.

In addition to the identified Explorers who will conduct work on the ship, each expedition will be joined by a number of citizen scientist participants. These individuals will join each expedition and participate in the scientific projects through daily citizen science activities through which they will assist in collecting data and conducting analysis under the guidance of the National Geographic Explorers leading each project. Citizen science activities will include participating in photo documentation and data collection while snorkeling, supporting species identification,
participating in educator engagement, and contributing to a digital multimedia mosaic. Different citizen scientists will join each expedition.

Each expedition will also be joined by a Native Hawaiian Liaison, identified in collaboration with the Monument’s Cultural Working Group. We anticipate that there will be a different Liaison on each of the five expeditions.
Papahānaumokuākea Marine National Monument
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Papahānaumokuākea Marine National Monument
Permit Application Cover Sheet

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Summary Information
Applicant Name: Hoffmann-Kuhnt, Dr. Matthias
Affiliation: Acoustic Research Laboratory, National University of Singapore

Permit Category: Special Ocean Use
Proposed Activity Dates: Up to ~23 days between August-October 2022
Proposed Method of Entry (Vessel/Plane): Vessel (E/V Nautilus)
Proposed Locations: Shallow water (<100m) within original PMNM boundary; TBD - Nihoa Island, Necker island (Mokumanamana), French Frigate Shoals, Gardner Pinnacles, Maro Reef, Laysan Island. Final locations will be determined based on sea state and weather conditions at the time of the expedition.

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

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Across all five expeditions a maximum of 107 people will be covered by National Geographic permits.

Estimated number of days in the Monument:

National Geographic Society will be participating in five expeditions in the Monument over a 72 day period. We anticipate that the duration of this project will be approximately 15 -23 days.

Description of proposed activities: (complete these sentences):

a.) The proposed activity would…

In partnership with Ocean Exploration Trust and National Geographic Society, we will conduct acoustic recordings of the underwater soundscape of PMNM in the possible presence of
cetaceans as well as vocalizing fish in both shallow and open water to gather baseline information about the soundscape of the Monument with new technology that combines synchronized audio and high resolution video.

b.) To accomplish this activity we would ….

Our team’s project is designed to be non-invasive and passive and is characterized by in-water recordings in the presence of cetaceans conducted by a swimmer/snorkeler or deployed overboard and tethered to a smaller vessel. As a procedure we would locate a possibly interesting species (i.e. spinner dolphins or any other vocalizing animals) and once we would have assessed their behavior, if suitable, would deploy a snorkeler/swimmer with the recording equipment. The snorkeler would then record the animals without disturbing their behavior for anywhere from a couple of minutes to several tens of minutes. The snorkeler would then return to the small boat and we would look for another possibility to record different animals. This process would continue as long as vocalizing animals would be present or until the recording unit would run out of battery power. Eventually the small boat would return to the main vessel and in the evening the data would be analyzed and processed and the unit would be re-charged overnight. Identification of individuals can be conducted visually, and the vocalizations can then be assigned to any animals visible on the video recording. At no time will specimens or physical samples be collected.

c.) This activity would help the Monument by …

The research conducted and data collected as part of this project will help us better understand the soundscape of PMNM and how it impacts marine mammals. As the largest conservation area in the country, the Monument provides an opportunity to gather baseline underwater synchronized acoustic and video data of this region, and the marine mammals that rely on it for survival, for the first time. Data gathered under this permit can shed insight on whether marine managed areas foster a healthier underwater soundscape, and serve as a baseline for comparison to unmanaged, heavily trafficked regions that experience more anthropogenic noise pollution.

Other information or background:

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Each expedition will also be joined by a Native Hawaiian Liaison, identified in collaboration with the Monument’s Cultural Working Group. We anticipate that there will be a different Liaison on each of the five expeditions.
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Summary Information
Applicant Name: Leonardo, Teresa
Affiliation: National Geographic Society

Permit Category: Special Ocean Use
Proposed Activity Dates: Up to ~23 days between August-October 2022
Proposed Method of Entry (Vessel/Plane): Vessel (E/V Nautilus)
Proposed Locations: Shallow water (<100m) within original PMNM boundary; TBD - French Frigate Shoals, Gardner Pinnacles, Maro Reef, Laysan Island. Final locations will be determined based on sea state and weather conditions at the time of the expedition.

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

A maximum of twenty-three individuals per expedition - including one or more NGS research teams, citizen scientists, a Native Hawaiian Liaison (identified in coordination with the Monument’s Cultural Working Group), and dive support specialists - will be covered by National Geographic Society Expedition Sponsor Program permits.

Across all five expeditions a maximum of 107 people will be covered by National Geographic permits.

Estimated number of days in the Monument:

National Geographic Society will be participating in five expeditions in the Monument over a 72 day period. We anticipate that the duration of this project will be approximately 15 -23 days.

Description of proposed activities: (complete these sentences):

a.) The proposed activity would...

... support effective management of the Papahānaumokuākea Marine National Monument (PMNM) through an investigation of three components that are critical to an understanding of change under current and future climate regimes: baseline habitat and fish surveys, carbonate budgets, and genomics of Montipora capitata, a coral that has shown an ability to thrive under higher temperatures and lower pH conditions. A parallel goal is to provide
opportunities for knowledge sharing to enhance an understanding of PMNM, and the changes it faces. Materials will be designed (especially for and with Hawaiian partners) to highlight the value of marine and cultural resources in order to protect Hawaiian heritage. Our goal is to understand the unique natural and cultural characteristics of the PMNM, document this journey through ArcGIS multimedia storytelling, and engage with youth to train the next generation of explorers and PMNM guardians.

b.) To accomplish this activity we would ….

...focus on achieving six objectives:

Obj 1 - To characterize the coral reef habitat, and fish abundance and diversity of the PMNM through reef surveys (using standard methods and photo quadrats).

Obj 2 - To estimate current carbonate budgets (a critical ecosystem service for wave attenuation and shoreline protection) of the PMNM using underwater photogrammetry and coral sampling (Montipora, Porites, and Pocillopora spp.).

Obj 3 - To characterize the abundance and characteristics of Montipora capitata, a sometimes 'weedy' coral that shows potential for adaptation under climate change conditions through 1) underwater photogrammetry and standard reef surveys (including colony morphology), and 2) in situ DNA sequencing (Oxford Nanopore technology) to investigate fine-scale population genomics and genes under selection.

Obj 4 - To create an educational resource that highlights the significance of exploration, investigation, the importance of coral reefs, cutting-edge technologies to evaluate and protect them (e.g. Nanopore technology, underwater photogrammetry, GIS, and image analysis).

Obj 5 - To promote local advocacy and stewardship by integrating scientific and indigenous knowledge through storytelling and the recognition of shared narratives.

Obj 6 - To capture the work of the expedition and document the coral reefs using hand-held, non-substrate, fixed, still photography, as well as motion and limited hydrophone recorded sound.

c.) This activity would help the Monument by …

This activity would help the Monument by improving our understanding of coral reefs under current and future climate regimes and filling the knowledge gaps in our understanding of how large and far from human pressure marine protected areas affect coral reefs in terms of habitat and fish, carbonate budgets, and population genomics of Montipora capitata which is important for the current and future management of PMNM. In addition, our activity includes creating educational resources combining multimedia storytelling and shared narratives with Native Hawaiians, which will help engage future PMNM guardians.

Other information or background:
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In addition to the identified Explorers who will conduct work on the ship, each expedition will be joined by a number of citizen scientist participants. These individuals will join each expedition and participate in the scientific projects through daily citizen science activities through which they will assist in collecting data and conducting analysis under the guidance of the National Geographic Explorers leading each project. Citizen science activities will include participating in photo documentation and data collection while snorkeling, supporting species identification, participating in educator engagement, and contributing to a digital multimedia mosaic. Different citizen scientists will join each expedition.

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Permit Application – Special Ocean Use
OMB Control # 0648-0548
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Summary Information

Applicant Name: Miller, Rachael Z.
Affiliation: Rozalia Project for a Clean Ocean

Permit Category: Special Ocean Use
Proposed Activity Dates: Up to 5 weeks between August-October 2022
Proposed Method of Entry (Vessel/Plane): Vessel (E/V Nautilus)
Proposed Locations: Shallow water (<100m) within original PMNM boundary; TBD - Nihoa Island, Necker island (Mokumanamana), French Frigate Shoals, Gardner Pinnacles, Maro Reef, Laysan Island. Final locations will be determined based on sea state and weather conditions at the time of the expedition.

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Across all five expeditions a maximum of 107 people will be covered by National Geographic permits.

Estimated number of days in the Monument:

National Geographic Society will be participating in five expeditions in the Monument over a 72 day period. We anticipate that the duration of this project will be approximately 15 - 38 days.

Description of proposed activities: (complete these sentences):

a.) The proposed activity would…

...create a map of microplastic and anthropogenic microfiber pollution found in the surface waters and air of the PMNM specifying multiple characteristic including material type, color,
b.) To accomplish this activity we would ....

...collect ocean surface grab samples using metal buckets, collect samples that investigate microplastics suspended in the air by using a pump-based air sampler and collect samples that investigate microplastics that fall out of the sky through deposition by using buckets. All sampling will occur from onboard the Nautilus and/or one of her tenders at approximately 72 locations for surface water and air (suspension) while the atmospheric deposition buckets will be left on deck for ongoing investigation.

All samples will be processed onto a filter paper (via gravity/vacuum/pump) and fixed with the new, innovative Easy Lift Tape onto a glass slide. The team will use a stereomicroscope and polarizing light microscope to count and characterize the microplastics and anthropogenic microfibers that are found in the samples. Morphological details will be recorded and all data will be mapped and made available for collaborators in the Monument, throughout the Hawaiian Islands and beyond.

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

...addressing a clearly stated issue in the Monument’s Management Plan that acknowledges “a better understanding of contaminant levels associated with marine debris is needed. Additionally, the toxicity risk to birds, fish, and other organisms from ingesting plastics and the persistent organic pollutants and other chemical pollutants that cling to them, or from consuming prey that has consumed microplastics, requires further study.” Furthermore, the plan acknowledges “the lack of regular monitoring for hazardous marine debris can result in potential hazards going unaddressed. Ideally, the detection, isolation, and removal of such hazardous debris would be beneficial.”

At this point, more and more studies are revealing those toxicity risks to myriad organisms, making the former statement one for whom answers are forthcoming. The data that are missing, however, are those related to knowing the type, distribution, and concentration of MPs in the Monument. Putting those two data sets together would have a tangible impact on furthering the understanding of a known and acknowledged threat to the PMNM. To date, however, likely because of the difficulty and expense of current methods, no studies have been done to investigate MPs in the surface and air throughout the PMNM and at the level that identifies the morphology and material ID of the microplastic and/or anthropogenic microparticles that are found.
An additional global data gap is the relationship between atmospheric and surface microplastics with macro-debris in a location that is a known sink, rather than a source for debris. The PMNM is extremely unique in this regard. Few islands can be found with this particular proximity to a subtropical convergence zone. The Bahamas island chain or Bermuda could be seen as similar in relation to being islands in the path of the subtropical convergence zone in the North Atlantic, but neither are protected in the same way as the PMNM and both could be considered sources as well as sinks, whereas the PMNM is not generating its own marine debris, just receiving it from other places. This makes it uniquely possible to analyze the relationship between microplastics in the surface and air compared to macro-debris on the surface or on land in a remote area that is a known marine debris sink. This could be a new and important discovery - both for the PMNM’s management itself and for understanding global MPs. Should we discover a link between the presence of MPs and macroplastics, our method would be an inexpensive and accessible way for any vessel to quickly identify marine debris hot spots, leaving a legacy of knowledge and action for the PMNM and its management as well as for the ability to understand MPs through citizen science around the world and compare those findings.

**Other information or background:**

The National Geographic Society is a global nonprofit that uses the power of science, exploration, education, and storytelling to illuminate the wonder of our world. For more than 130 years, the Society has identified and funded trailblazing scientists, researchers, conservationists, storytellers, and educators—known as National Geographic Explorers—from around the world who are working to better understand our world and everything in it.

To expand this work to help safeguard the world’s ocean, the National Geographic Society is partnering with Ocean Exploration Trust from August — October 2022 by leveraging their ship, the E/V Nautilus, to conduct five research expeditions led by National Geographic Explorers in Papahānaumokuākea Marine National Monument. The Society has submitted permit applications for five distinct research projects, which together form the “National Geographic Society Expedition Sponsor Program.” Some of the five NGS expeditions will include multiple NGS research teams, and some of the NGS research teams will join multiple expeditions. During the period when the NGS teams are onboard, Ocean Exploration Trust will simultaneously be conducting seafloor mapping surveys funded by NOAA Ocean Exploration, focusing on areas that have not previously been mapped at high resolution.

In addition to the identified Explorers who will conduct work on the ship, each expedition will be joined by a number of citizen scientist participants. These individuals will join each expedition and participate in the scientific projects through daily citizen science activities through which they will assist in collecting data and conducting analysis under the guidance of the National Geographic Explorers leading each project. Citizen science activities will include participating in photo documentation and data collection while snorkeling, supporting species identification, participating in educator engagement, and contributing to a digital multimedia mosaic. Different citizen scientists will join each expedition.