UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NOAA Marine and Aviation Operations
Marine Operations Center
439 W. York Street
Norfolk. VA 23510-1114

April 14, 2017

MEMORANDUM FOR: Captain Mark Wetzler, NOAA
Commanding Officer, NOAA Ship *Okeanos Explorer*

FROM: Captain Scott M. Sirois, NOAA
Commanding Officer, NOAA Marine Operations Center-Atlantic

SUBJECT: Project Instruction for EX-17-05
American Samoa, Kingman / Palmyra, Jarvis (ROV & Mapping)

Attached is the final Project Instruction for EX-17-05, American Samoa, Kingman / Palmyra, Jarvis (ROV & Mapping), which is scheduled aboard NOAA Ship Okeanos Explorer during the period of April 27- May 19, 2017. Of the 23 DAS scheduled for this project, 5 DAS are funded by an OAR Line Office Allocation, and 18 DAS are funded by NOAA National Marine Fisheries Service. This project is estimated to exhibit a High Operational Tempo. Acknowledge receipt of these instructions via e-mail to Opsmgr.MOA@noaa.gov at Marine Operations Center-Atlantic.

Ocean Exploration and Research

Project Instructions

Date Submitted: April 19, 2017

Platform: NOAA Ship *Okeanos Explorer*

Project Number: EX-17-05

Project Title: American Samoa, Kingman / Palmyra, Jarvis (ROV & Mapping)

Project Dates: April 27- May 19, 2017

Prepared by: Kasey Cantwell **Dated:** 4/19/2017

Kasey Cantwell, NOAA
Expedition Coordinator
Office of Ocean Exploration & Research

Approved by: _____ **Dated:** 4/19/2017

Craig Russell
Program Manager
Office of Ocean Exploration & Research

Approved by: _____ **Dated:** 4/25/17

Captain Scott M. Sirois, NOAA
Commanding Officer
Marine Operations Center - Atlantic

I. Overview

> "America's future depends on understanding the ocean. We explore the ocean because its health and resilience are vital to our economy and to our lives. We depend on the ocean to regulate weather and climate; sustain a diversity of life; for maritime shipping and national defense; and for food, energy, medicine, and other essential services to humankind."
>
> *- NOAA Office of Ocean Exploration and Research Strategic Plan*

A. Brief Summary and Project Period

This document contains project instructions for EX-17-05. Operations for this cruise will be conducted 24 hours/day and consist of daily remotely operated vehicle (ROV), overnight mapping, and full shore-based participation via telepresence. Operations will be conducted within several marine protected areas. The expedition will commence on April 27, 2017 in Pago Pago, American Samoa (14° 16.3' S, 170° 41.22'W) and conclude on May 19, 2017 in Honolulu, Hawaii (21° 22' 2.62"N, 157° 57' 51.32"W). Operations will include the use of the ship's deep water mapping systems (Kongsberg EM302 multibeam sonar, EK60 split-beam fisheries sonars, Knudsen 3260 chirp sub-bottom profiler sonar, and Teledyne Acoustic Doppler Current Profilers), XBT and Underway CTD casts in support of multibeam sonar mapping operations, OER's 6000 m two-body ROV Deep Discoverer and Seirios, and the ship's high-bandwidth satellite connection for continuous real-time ship-to-shore communications. Operations are planned in American Samoa, the Cook Islands, the high seas, Kiribati, Hawaii, and the Pacific Remote Islands Marine National Monument's (PRIMNM) Jarvis Island and Kingman Reef/Palmyra Atoll Units.

NOAA Ship *Okeanos Explorer* systematically explores the ocean every day of every cruise to maximize public benefit from the ship's unique capabilities. With approximately 95% of the ocean unexplored, we pursue every opportunity to map, sample, explore, and survey at planned destinations as well as during transits; "Always Exploring" is a guiding principle. An integral element of *Okeanos Explorer*'s "Always Exploring" model is the ship's seafloor and water column mapping capabilities. The sonars, or a subset the sonars (EM 302, EK 60, Knudsen sub-bottom, ADCPs) on board will be operated at all times throughout the cruise when the ROV or CTD rosette operations are not being conducted. This allows for continued exploration and seabed, water column, and/or sub-bottom data collection.

This expedition is part of a three year Campaign to Address Pacific monument Science, Technology, and Ocean Needs (CAPSTONE) focused on systematically collecting baseline

information to support science and management needs within and around the Monuments and other protected places in the Pacific, and serves as an opportunity for NOAA and the Nation to highlight the uniqueness and importance of these national symbols of ocean conservation. NOAA will work with the scientific and management community to characterize unknown and poorly-known areas through telepresence-based exploration. Baseline information collected during this cruise will support and catalyze further exploration, research and management activities.

Understanding biogeographic patterns between and among the Pacific Monuments and Sanctuaries is a coordinating theme for CAPSTONE science priorities. Themes and objectives for the expedition series include:

- Acquire data to support priority Monument and Sanctuaries science and management needs, including habitat surveys in recently expanded boundary areas;
- Identify and characterize vulnerable marine habitats - particularly potential locations for high density deep sea coral and sponge communities;
- Characterize seamounts within the Prime Crust Zone (PCZ). The PCZ is the area of the Pacific with the highest expected concentration of deep sea minerals, including rare metals and rare earth elements;
- Collect information on the geologic history of Central Pacific Seamounts, including those that are or may be relevant to our understanding of plate tectonics and subduction zone biology and geology; and
- Provide a foundation of publicly accessible data and information products to spur further exploration, research, and management activities.

B. Days at Sea (DAS)

Of the 23 DAS scheduled for this project, 0 DAS are funded by an OMAO allocation, 5 DAS are funded OAR Allocation, and 18 DAS are funded by NOAA National Marine Fisheries Service. This project is estimated to exhibit a High Operational Tempo due to 24 hour operations consisting of daily ROV dives, possible CTD rosette casts, overnight mapping operations and continuous shore-side participation via telepresence.

C. Operating Area

EX-17-05 of the CAPSTONE Expeditions is a combined ROV and mapping cruise that will focus operations in Kingman Reef and Palmyra Atoll and Jarvis Island Units of PRIMNM with some operations in the Cook Islands, Kiribati, American Samoa, and the high seas. Mapping, ROV and CTD rosette operations will focus in depths generally between 250 and 6,000 meters.

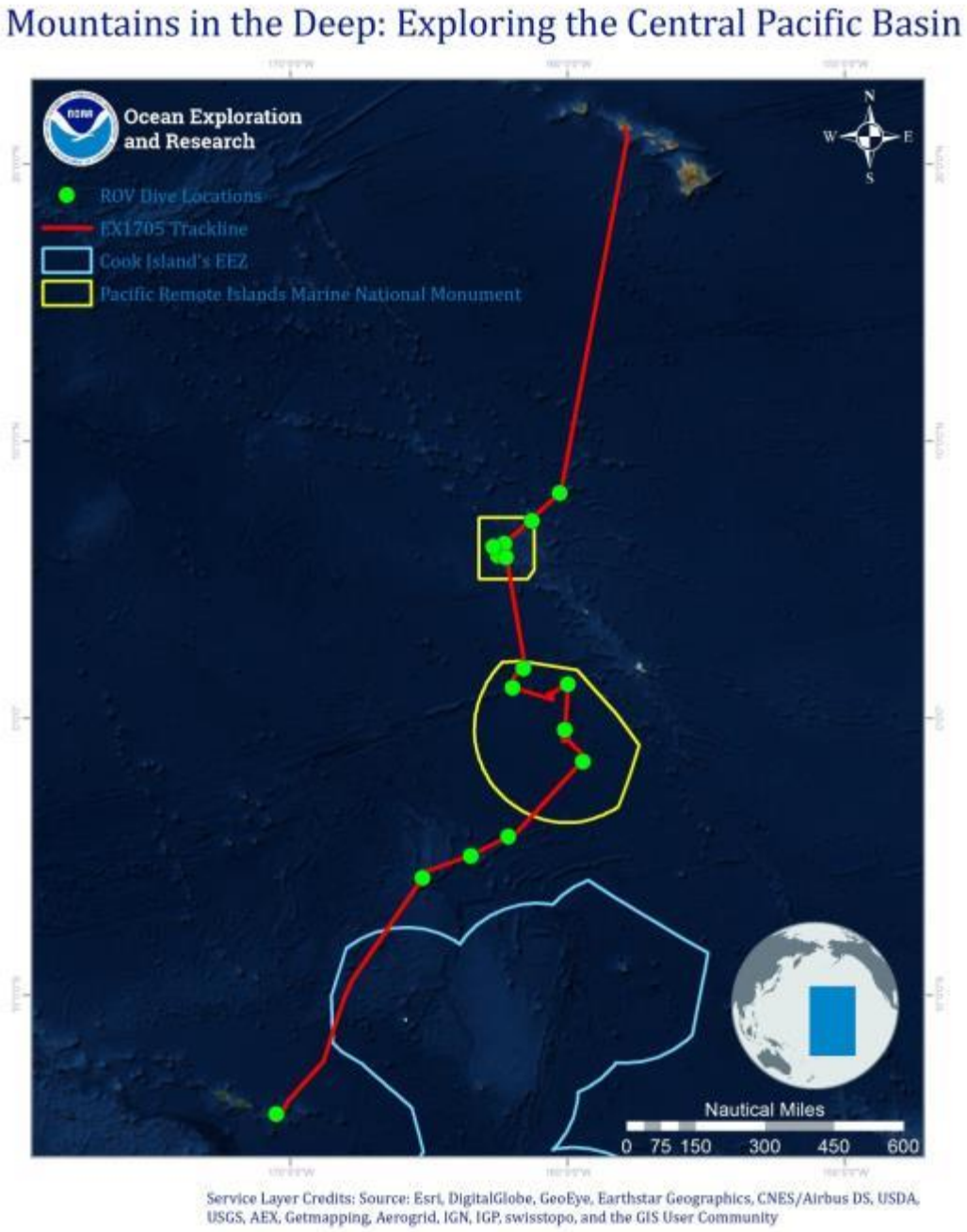

Figure 1: Map showing the general expedition operating area. The red line is the rough cruise track from American Samoa to Hawaii during EX-17-05. The yellow polygons represent the boundaries of the Pacific Remote Islands Marine National Monument. The light blue polygon designates Marae Moana (Cook Islands). Planned ROV dives are represented by green markers

Generalized operating area coordinates		
ID	**Latitude**	**Longitude**
SW corner	14°17'3.95"S	170°29'55.21"W
SE corner	16°36'36.25"S	163°58'24.88"W
NE corner	18°32'39.57"N	154° 0'52.16"W
NW corner	21° 22' 2.62"N	157° 57' 51.32"W

Table 1: Bounding coordinates of the EX-17-05 operating area

D. Summary of Objectives

April 27 – May 19, 2017 (Pago Pago, American Samoa to Honolulu, HI) Telepresence-enabled ROV, CTD rosette, and mapping Operations.

EX-17-05 operations will occur in the waters of American Samoa, the Cook Islands, Kiribati, the high seas and the US EEZ around Jarvis Island, Kingman Reef, and Palmyra Atoll. This cruise will collect baseline data and information to support priority NOAA science and management needs including in multiple marine protected areas of the Pacific Ocean.

Mission objectives for EX-17-05 include a combination of mapping/operational, science, education, outreach, and data management objectives:

1. Science
    a. Acquire data to support priority Monument and Sanctuary science and management needs;
    b. Identify and map vulnerable marine habitats – particularly high-density deep-sea coral and sponge communities;
    c. Explore the diversity and distribution of benthic habitats – including bottom fish habitats and deep-sea coral communities;
        i. Collect data on: habitat size and extent, animal diversity and density;
        ii. Focus close-up imaging operations on potential new, rare and poorly documented animals as well as dominant members of the communities;
        iii. Collect and preserve biological samples of potential new species, new records, dominant community members if not easily recognized, and other animals to aid in site characterization
    d. Investigate biogeographic patterns of deep-sea ecosystems and connectivity across Pacific seamounts and throughout remote Pacific marine protected areas;
    e. Investigate the geology of Pacific seamounts, constraining their morphology, age, and potential relevance to plate tectonic and plume processes;
    f. Collect high-resolution bathymetry in areas with no (or low quality) sonar data;

g. Acquire a foundation of sonar and oceanographic data to better understand the characteristics of the water column in remote areas;
h. Continue to refine specimen collection protocols and processing procedures;
i. Ground-truth acoustic data using video imagery and characterize associated habitat;
j. Engage a broad spectrum of the scientific community and public in telepresence-based exploration;
k. Successfully conduct operations in conjunction with shore-based Exploration Command Centers and remote science team participants;
l. Create and provide input into standard science products to provide a foundation of publicly accessible data and information products to spur further exploration, research, and management activities.

2. Remote Science/Exploration Command Centers
   a. Provide operational support and training to scientists and managers to enable remote participation in at-sea operations;
   b. Develop and test best practices for hosting internet-1 based live interactions;
   c. Facilitate outreach and engagement activities and events at the ECCs;
   d. Test and refine ship-to-shore communications procedures that engage multiple ECCs and other remote participants;
   e. Conduct test of new science model in collaboration with the Cooperative Institute for Ocean Exploration, Research, and Technology to increase shore-side collaboration and participation, and to help ensure data are used to the fullest extent, to increase awareness in the marine science community about available data, and to test new science products;
   f. Test and refine operating procedures and products.

3. ROV Engineering
   a. Daytime ROV dives on exploration targets;
   b. Ongoing training of pilots;
   c. Ongoing system familiarization, documentation, and training;
   d. Test and refine new ROV systems and pilot sampling protocol
   e. Prepare for dry dock at the conclusion of the cruise.

4. Video Engineering (VSAT ~15 mb/sec ship-to-shore; 2.5 mb/sec shore-to-ship)
   a. Test terrestrial and high-speed satellite links
   b. Support telepresence-enabled ROV operations;
   c. Collect/create all standard video products;
   d. Continue to refine new highlight video SOPs;
   e. Facilitate live outreach events between ship and shore;
   f. Continue to refine protocols for using YouTube live to host live video;

g. Test and refine new video compression and editing hardware;
h. Formalize / Finalize parallel processing of imagery and video compression routines;
i. Develop protocols and procedure for using the Telestream video recording suite.

5. Mapping
    a. Collect high resolution mapping data from sonars in priority areas as dictated by operational needs as well as science and management community needs;
    b. Support ROV operations with mapping products and expertise;
    c. Conduct mapping operations during transit, with possible further development of exploration targets;
    d. Collect XBT casts as data quality requires, during mapping operations;
    e. Create daily standard mapping products;
    f. Collect sun photometer measurements as part of survey of opportunity;
    g. Continue refining the procedure for conducting XBT casts using the autolauncher system and applying the sound velocity profiles to the multibeam sonar;
    h. Prepare for dry dock at the conclusion of the cruise.

6. Data Management
    a. Provide a foundation of publicly accessible data and information products to spur further exploration, research, and management activities;
    b. Provide daily products to shore for operational decision making purposes;
    c. Test protocols and procedures for handling the data from the Telestream video recording system;
    d. Refine protocols for digital data associated with physical samples
    e. Cross train existing ROV dedicated personnel;
    f. Formalize Data Management SOPs.

7. Outreach
    a. Engage the general public in ocean exploration through live video and timely content (daily updates, topical essays and web logs, highlight videos, video clips, still imagery and mapping products) posted on the Ocean Explorer website;
    b. Host live events and interactions with shore. Final list is TBD, current list can be viewed here: https://docs.google.com/a/noaa.gov/document/d/1vSq6Xu-sfuKYErE7PWDAaSDCooKhWhbhUsMHuBoSKps/edit?usp=sharing
    c. Conduct VIP live interactions with NOAA Acting Administrator (5/10) and NOAA Science Advisory Board (4/24).
    d. Conduct ship tours for the public, students, teachers, managers and officials while in port in Pago Pago.
    e. Conduct a small boat transfer near Palmyra on 5/11 to bring 8 TNC/USFWS personnel aboard for a tour and to observe the ROV dive.

f. More TBD.

8. Resupply of Palmyra Field Station
    a. Resupply Palmyra Field Station with three 100 lbs tanks of propane;
    b. Conduct small boat operations to transfer propane to field station.

9. Ship
    a. Provide a high quality stable internet connection with the VSAT;
    b. Provide stable and reliable VoIP tele communications;
    c. Continue training new deck department personnel in ROV launch and recovery;
    d. Participate in outreach activities while in Pago Pago;
    e. Develop and maintain proficiency with small boat operations for new and long term crew;
    f. Continue troubleshooting the CTD rosette.

E. Participating Institutions

- National Oceanic and Atmospheric Administration (NOAA), Office of Ocean Exploration and Research (OER)–1315 East-West Hwy, Silver Spring, MD 20910 USA
- NOAA, National Oceanographic Data Center, National Coastal Data Development Center, Stennis Space Center MS, 39529 USA
- University Corporation for Atmospheric Research Joint Office for Science Support (JOSS), PO Box 3000 Boulder, CO 80307 USA
- University of Hawai'i at Manoa- 2500 Campus Rd, Honolulu, HI 96822
- University of New Hampshire (UNH) Center for Coastal and Ocean Mapping (CCOM) Jere A. Chase Ocean Engineering Lab, 24 Colovos Rd, Durham, NH 03824 USA
- Global Foundation for Ocean Exploration, P.O. Box 417, Mystic, CT 06355
- NOAA National Marine Fisheries Service, Pacific Islands Regional Office, 1845 Wasp Blvd, Honolulu, HI 96818
- NOAA National Marine Fisheries Service, Marine National Monuments Program, 1845 Wasp Blvd, Honolulu, HI 96818
- NOAA National Marine Sanctuary of American Samoa, P.O. Box 4318, Pago Pago, American Samoa 96799
- NOAA National Marine Fisheries Service, Pacific Islands Fisheries Science Center, 1845 Wasp Blvd, Honolulu, HI 96818
- University of Louisiana at Lafayette (ULL), 104 E University Ave, Lafayette, LA 70504
- North Carolina State University (NCSU), Raleigh, NC 27695
- Cooperative Institute for Ocean Exploration, Research, and Technology (CIOERT) at Harbor Branch Oceanographic Institute Foundation, 5600 US-1, Fort Pierce, FL 34946

F. Personnel (Mission Party)

Table 2: Full list of sea going mission party members and their affiliations

#	Name (First, Last)	Title	Date Aboard	Date Disembark	Gender	Affiliation	Nationality
1	Kasey Cantwell	Expedition Coordinator	4/21	5/20	F	OER	USA
2	Scott France	Biology Science Lead	4/24	5/20	M	USGS	Canadian/ US Permanent Resident
3	Del Bohnenstiehl	Geology Science Lead	4/24	5/20	M	UCAR/NCSU	USA
4	Amanda Netburn	Sample Data Manager	4/24	5/20	F	CIOERT/OER	USA
5	Michael White	Mapping Lead	4/21	4/20	M	OER	USA
6	Kevin Jerram	Mapping Watch Lead	4/24	5/20	M	UCAR	USA
7	Bobby Mohr	Engineering Team	4/24	5/20	M	GFOE	USA
8	Fernando Aragon	Engineering Team	4/24	5/20	M	GFOE	Colombian/ US Permanent Resident
9	Joshua Carlson	Engineering Team	4/24	5/20	M	GFOE	USA
10	Andy Lister	Engineering Team	4/24	5/20	M	GFOE	USA
11	Levi Unema	Engineering Team	4/21	5/20	M	GFOE	USA
12	Jeffrey Laning	Engineering Team	4/24	5/20	M	GFOE	USA
13	Sean Kennison	Engineering Team	4/21	5/20	M	GFOE	USA
14	Chris Ritter	Engineering Team	4/24	5/20	M	GFOE	USA
15	Don Liberatore	Engineering Team	4/24	5/20	M	GFOE	USA
16	Dan Rogers	Engineering Team	4/24	5/20	M	GFOE	USA
17	Emily Narrow	Engineering Team	4/24	5/20	F	GFOE	USA
18	Caitlin Bailey	Engineering Team	4/24	5/20	F	GFOE	USA
19	Roland Brian	Engineering Team	4/24	5/20	M	GFOE	USA

20	Annie White	Engineering Team	4/24	5/20	F	GFOE	USA
21	Bob Knott	Engineering Team	4/24	5/20	M	GFOE	USA
22	Neah Baechler	Mapping Watch Stander	4/24	5/20	F	OER	USA
23	Amy Bowman	Web Coordinator	4/24	5/20	F	OER	USA

G. Administrative

1. Points of Contact:

Ship Operations

Marine Operations Center, Atlantic (MOA)
439 West York Street
Norfolk, VA 23510-1145
Telephone: (757) 441-6776
Fax: (757) 441-6495

Chief, Operations Division, Atlantic (MOA)
LT Joe Carrier, NOAA
Telephone: (757) 441-6842
E-mail: Chiefops.MOA@noaa.gov

Mission Operations

Kasey Cantwell
Expedition Coordinator
NOAA Office of Ocean Exploration and Research
O: (301)-734-1050
C: (301) 717-7776
E-mail: Kasey.cantwell@noaa.gov

Mike White
Mapping Lead
NOAA Office of Ocean Exploration and Research (ERT)
O: (603) 862-5247
C: (631) 561-9802
E-mail: Michael.white@noaa.gov

CAPT Mark Wetzler, NOAA
Commanding Officer
NOAA Ship *Okeanos Explorer*
Phone: (401) 378-8284
Email: CO.Explorer@noaa.gov

LT Aaron Colohan, NOAA
Operations Officer
NOAA Ship Okeanos Explorer
Phone: (808) 659-9197 (Ship's Iridium)
E-mail: Ops.Explorer@noaa.gov

Other Mission Contacts

Craig Russell
Program Manager
NOAA Ocean Exploration & Research
Phone: (206) 526-4803 / (206) 518-1068
E-mail: Craig.Russell@noaa.gov

CDR William Mowitt, Deputy Director
NOAA Ocean Exploration & Research
Phone: (301) 734-1023
E-mail: William.Mowitt@noaa.gov

Brian Kennedy
Expedition Manager
NOAA Office of Ocean Exploration and Research
Cell: (706) 540-2664
E-mail: Brian.Kennedy@noaa.gov

Alan Leonardi, Director
NOAA Ocean Exploration & Research
Phone: 301-734-1016/ Mobile: 202-631-1790
E-mail: alan.leonardi@noaa.gov

Vessel Shipping Address

1. Shipments

Send an email to the *Okeanos Explorer* Operations Officer at OPS.Explorer@noaa.gov indicating the size and number of items being shipped.

Polynesia Shipping Services, Inc
PO Box 1478
ATTN: Okeanos Explorer
Pago Pago, AS
United States of America

2. Diplomatic Clearances

This project involves Marine Scientific Research in waters of Kiribati and the Cook Islands. Copies of the Diplomatic Notes approving exploration activities can be found in Appendices F and I.

3. Licenses and Permits

The expedition is being planned and conducted by NOAA as an agency of the U.S. Federal government, in partnership with NOAA NMFS Pacific Islands Regional Office Marine National Monument Program. We do not require a permit to work in the Pacific Remote Islands Marine National Monument.

A request to conduct operations in the National Marine Sanctuary of American Samoa was submitted and received (permit #NMSAS-2017-001). Please see Appendix G for the full text.

A request to conduct operations and collect samples in the territorial waters of American Samoa was submitted to the Division of Marine and Wildlife Resources. The permit was received on January 19, 2017- full text is included in Appendix G.

A permit to conduct exploration activities inside of Marae Moana (Cook Islands) has been requested and received (permit # 05/17). Please see Appendix F for the full text.

Pursuant to the National Environmental Policy Act (NEPA), NOAA OER is required to include in its planning and decision-making processes appropriate and careful consideration of the potential environmental consequences of actions it proposes to fund, authorize and/or conduct. NOAA's Administrative Order (NAO) 216-6A Companion Manual describes the agency's specific procedures for NEPA compliance. Among these is the need to review all proposed NOAA-supported field projects for their environmental effects. A categorical exclusion (CE) evaluation memorandum has been completed for this survey, in accordance with Section 4 of the Companion Manual. This evaluation document memorandum describes EX1704 and explains how it is consistent with one or more of the CE categories listed/described in Appendix E of the Companion Manual. The completed evaluation document also summarizes the review conducted to determine that no extraordinary circumstances exist that would preclude the use of a CE or require preparation of an environmental assessment or environmental impact statement (Appendix C).

Informal consultation was initiated under Section 7 of the Endangered Species Act (ESA), requesting NOAA Fisheries' Protected Resources Division concurrence with our biological evaluation determining that 2016 Marianas Expedition and all other planned *Okeanos Explorer* operations during the 2016-17 field season, may affect, but are not likely to adversely affect, ESA-listed marine species. The informal consultation was completed on February 3, 2016 when NOAA OER received a signed letter from the Regional Administrator of NMFS Pacific Islands Regional Office, stating that NMFS concurs with OER's determination that conducting proposed *Okeanos Explorer* cruises are not likely to adversely affect ESA-listed marine species (Appendix D).

OER has completed consultation with NOAA's Habitat Conservation Division on potential impacts of our operations to Essential Fish Habit (EFH). They concurred that our operations would not adversely affect EFH provided adherence to our proposed procedures and their guidance stated in the letter (Appendix E).

II. Operations

The Expedition Coordinator is responsible for ensuring the scientific staff are trained in planned operations and are knowledgeable of project objectives, priorities and environmental compliance procedures. The Commanding Officer is responsible for ensuring all operations conform to the ship's accepted practices and procedures.

A. Project Itinerary

(All times and dates are subject to prevailing conditions and the discretion of the Commanding Officer)

Date	Activities
4/21	Some EX1705 personnel arrive
4/22	Festival of Sites in Pago Pago
4/23	No activities planned
4/24	Full day of public tours, remaining mission personnel arrive.
4/25	Mission prep, VIP tours and some public/school group tours.
4/26	Mission prep
4/27	Depart Pago Pago, AS 0900. Transit to Aunu'u Unit of NMSAS for Dive 1. Short (~5 hour) dive, recover by 1630 and begin transit north.
4/28	Transit day
4/29	Transit day
4/30	Dive 2: Northern Manahiki Plateau
5/1	Dive 3: Northern Manahiki Seamount
5/2	Dive 4: Abyssal site. Extended (10 hour) dive.
5/3	Transit Day. Argo float deployment.
5/4	Dive 5: South Jarvis Seamount
5/5	Dive 6: Jarvis Island
5/6	Dive 7: Jarvis A
5/7	Dive 8: Jarvis B + water column transects. Extended (10 hours) dive.
5/8	Dive 9: Jarvis C
5/9	Transit Day. Argo Float deployment.
5/10	Dive 10: Palmyra SW
5/11	Dive 11: Palmyra. Potential small boat transfer from Palmyra Field Station.

5/12	Dive 12: Kingman
5/13	Dive 13: Kingman 2 + water column transects. Extended (10 hour) dive
5/14	Dive 14: North EEZ Seamount
5/15	Dive 15: Carole Seamount
5/16	Transit. Argo float deployment(s).
5/17	Transit. Argo float deployment.
5/18	Transit.
5/19	Arrive in Honolulu, HI. De- Mobilization and preparation for dry dock. Meme Lobecker arrives to prep mapping systems for dry dock.
5/20	EX1705 Mission personnel depart. EX transits to dry dock.

Table 2: Detailed Cruise Itinerary. This is an approximate itinerary and is subject to change based on community input, survey results, field conditions, and discretion of the CO.

B. Staging and Destaging

Minimal staging is expected as all mission equipment will be onboard already. Standard preparation for ROV expeditions is anticipated, which includes hydraulic use and high voltage operations. We also anticipate needing crane operations for approximately 30 minutes to one hour to load propane tanks onto the ship for the Palmyra resupply.

At the conclusion of EX1705 the following actions will be done to prepare for dry dock:

ROVs

- ROV Deep Discoverer's (D2) tether coiled up and secured to D2.
- D2 will be covered, tarped, and secured in Okeanos hangar
- Seirios's 0.68 cable disconnected and stored in flag block
- Seirios's tether disconnected and tied to D2
- Seirios covered and protected, and then moved to Ford Island warehouse. This will require crane, forklift, deck operations for approximately 1 hour

ROV Container:

- The ROV container will be locked and secured
- Remains on Okeanos until removed at dry dock to safe location

Sampling Equipment:

- All sampling equipment and samples will be offloaded to Chris Kelley's lab at the University of Hawaii prior to departing for dry dock

Mapping Equipment:

- Prior to entering dry dock, the ship will ensure the blocks are appropriately placed to prevent damage to the sonar transducers
- All sonars and related computer systems will be shut down prior to dry dock
- ET needs to located the alan key for the sonar fairing drain plug
- Sonar fairing plug needs to be removed to allow the sonar fairing to drain while the ship goes onto blocks
- Once in dry dock, the ship will ensure transducers are protected prior to beginning pressure washingxx

Workspaces:
-Hangar secured and pathways marked
-Hangar pit locked and secured
-Loose items and equipment secured and protected
-Winch areas covered and protected

The following spaces will be secured during dry dock: control room, rack room, ROV workshop. All mission computers and equipment will be powered down and prepared for dry dock by 5/20.

During the inport period and while in dry dock (May 19 – May 25), OER and GFOE will be doing a full property inventory to be compliant with NOAA requirements. As part of this, the services of an ET will be required for at least two full days, intermittently spread over several days, and of the ship's property officer intermittently during this period. OER will need access to the dry dock facility for OER and GFOE personnel participating in this inventory.

Additionally, two GFOE engineers will need access to the dry dock facility and access to the Sonar Hatch as soon as possible after the ship is up on blocks and cleared. The GFOE engineers would like to check on the USBL equipment. At a suitable time, to be scheduled with the ship at a later point, GFOE will also need to offload the ROV container.

C. Operations to be Conducted

1. **Telepresence / Outreach Events**
    a. Three live video feeds will be used throughout the cruise to provide situational awareness for onshore personnel.
    b. At least three live interactions are planned during the cruise with OER teacher professional development workshops
    c. 1-3 interactions are planned with the Cook Islands
    d. 1 interaction is planned with New Zealand's National Institute of Water and Atmospheric Research
    e. 2-3 NOAA VIP interactions with Silver Spring ECC
    f. Additional live events are likely but TBD

2. **In-Port Events**
    a. Public ship tours are planned for the full day on 4/24 with a small group of OER/GFOE personnel. This event is anticipated to be low impact on the ship with the request for 1 person to conduct the safety briefing at the beginning of the tour.
    b. VIP tours and select public tours 4/24 and 4/25. Tours will be handled primarily by OER personnel with assistance from the ship requested on the bridge and for VIP greetings.
    c. NOAA Sanctuaries will be hosting a Festival of Sites to highlight American Samoa culture on 4/22. Mission personnel will be participating, but there is no request from the ship's crew. The invitation to the event is extending to EX for those who are interested.

In port schedule:

Pago Pago In-Port
April 21 - 26

= Okeanos at sea

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
16	**17**	**18**	**19**	**20** Okeanos arrives in Pago Pago and fuels **7 PM EDT**: Webinar for educators	**21** OER & GFOE arrive: Dave, Amy, Kasey, Mike Roland, Sean, Levi	**22** (Earth Day) **8 AM - 2 PM** NMSAS Festival of Sites event for cruise ship (EX crew to attend, OER to man table with materials, Dave to present at Ocean Center 2 times) **3PM:** Dave meet with Roland & Kasey for Control Room Brief
23 - No Events -	**24** **7:30-9:00**: Kasey & Mike in meeting **9 AM:** SAB interaction (David & Roland) **9 AM - 4 PM:** Full day ship tours **11 AM:** OSA Brief (Dave & Amy) **9:30 PM**: Other mission personnel arrive	**25** **7:30 AM:** Educator Professional Development & Ship Tours @ **12pm and 4pm** ? **8 AM - 2:30 PM** Half-day public ship tours Dan test technology **6 PM**: Dan Roger's Seminar (Ocean Center)	**26** Brian Peck to tour ship and deliver propane - No Events - Cruise Prep	**27** Okeanos departs Pago Pago Dive 1: Aunu'u Unit	**28** Transit	**29** Transit Live telepresence interaction with PD workshop (National Aquarium, Baltimore)?

D. SCUBA Dive Plan

All dives are to be conducted in accordance with the requirements and regulations of the NOAA Diving Program and require the approval of the ship's Commanding Officer. No dives are planned during EX1705.

E. Applicable Restrictions

Sonar Operations

EM 302, EK 60, ADCP, and sub-bottom profiler data acquisition is planned for this cruise. All data acquisition will be conducted in accordance with established standard operating procedures under the direction of the mapping team lead. These operating procedures will include protection measures when operating in the vicinity of marine mammals, sea turtles or Endangered Species Act-listed species as described in appendices of this document. The final

decision to operate and collect 24-hour sub-bottom profiler data will be at the discretion of the Commanding Officer.

III. Equipment

A. Equipment and capabilities provided by the ship

- Kongsberg Simrad EM302 Multibeam Echosounder (MBES)
- Kongsberg Simrad EK60 Deepwater Echosounders and GPTs (18, 70, 120, 200 kHz)
- Knudsen Chirp 3260 Sub-bottom profiler (SBP)
- Teledyne RDI Workhorse Mariner (300 kHz) ADCP
- Teledyne RDI Ocean Surveyor (38 kHz) ADCP
- Teledyne Underway CTD
- LHM Sippican XBT Mark21 System(Deep Blue probes)
- AOML Automated XBT Launcher (Deep Blue probes)
- Seabird SBE 911Plus CTD
- Seabird SBE 32 Carousel and 24 2.5 L Niskin Bottles
- Light Scattering Sensor (LSS)
- Oxidation – Reduction Potential (ORP)
- Dissolved Oxygen (DO) sensor
- Altimeter Sensor and battery pack
- MarineStar GPS
- POS/MV
- Seabird SBE-45 (Micro TSG)
- Kongsberg Dynamic Positioning-1 System
- Netshares mapping storage system
- IVS Fledermaus Software suite
- SIS Software
- Hypack Software
- Scientific Computing System (SCS)
- ECDIS
- Met/Wx Sensor Package
- Telepresence System
- VSAT High-Speed link (Comtech 20 Mbps ship to shore; 2 Mbps shore to ship)
- Cruise Information Management System (CIMS)
- Three VoIP telephone lines
- 1 functioning and seaworthy SOLAS approved fast rescue boat

- 1 functioning and seaworthy work boat to support ROV operations and personnel transfers

B. Equipment and capabilities provided by the scientists

- Microtops II Ozone Monitor Sun photometer and handheld GPS required for NASA Marine Aerosols Network supplementary project.
- NOAA OER 6000 m *Deep Discoverer* ROV
- NOAA *Seirios* Camera Platform

IV. Hazardous Materials

A. Policy and Compliance

The Expedition Coordinator is responsible for complying with FEC 07 Hazardous Materials and Hazardous Waste Management Requirements for Visiting Scientific Parties (or the OMAO procedure that supersedes it). The Expedition Coordinator and Science Team Lead will be responsible for transporting all samples and HAZMAT on and off the ship. By Federal regulations and NOAA Marine and Aviation Operations policy, the ship may not sail without a complete inventory of all hazardous materials by name and quantity, MSDS, appropriate spill cleanup materials (neutralizing agents, buffers, or absorbents) in amounts adequate to address spills of a size equal to the amount of chemical brought aboard, and chemical safety and spill response procedures. Documentation regarding those requirements will be provided by the Chief of Operations, Marine Operations Center, upon request.

Per OMAO procedure, the scientific party will include with their project instructions and provide to the CO of the respective ship 30 days before departure:

- List of chemicals by name with anticipated quantity
- List of spill response materials, including neutralizing agents, buffers, and absorbents
- Chemical safety and spill response procedures, such as excerpts of the program's Chemical Hygiene Plan or SOPs relevant for shipboard laboratories
- For bulk quantities of chemicals in excess of 50 gallons total or in containers larger than 10 gallons each, notify ship's Operations Officer regarding quantity, packaging and chemical to verify safe stowage is available as soon as chemical quantities are known.

Upon embarkation and prior to loading hazardous materials aboard the vessel, the scientific party will provide to the CO or their designee:

- An inventory list showing actual amount of hazardous material brought aboard
- An MSDS for each material
- Confirmation that neutralizing agents and spill equipment were brought aboard sufficient to contain and cleanup all of the hazardous material brought aboard by the program
- Confirmation that chemical safety and spill response procedures were brought aboard

Upon departure from the ship, scientific parties will provide the CO or their designee an inventory showing that all chemicals were removed from the vessel. The CO's designee will maintain a log to track scientific party hazardous materials. MSDS will be made available to the ship's complement, in compliance with Hazard Communication Laws.

Scientific parties are expected to manage and respond to spills of scientific hazardous materials. Overboard discharge of hazardous materials is not permitted aboard NOAA ships.

B. Inventory

Item	Use	Approx. locations
95% Denatured Ethanol (35 gallons)	Sample preservation	Wetlab, under the chemical hood
10% Buffered Formalin (3 gallons)	Sample preservation	Wetlab, under the chemical hood
Chaos Buffer (0.5 gallons) (4 M guanidine thiocyanate, 0.5% N-laurosylsarcosine, 25 mMTris pH 8.0, 0.1 M beta-mercaptoethanol)	Sample preservation (genetics)	Wetlab, under the chemical hood
Aqua Shield	Underwater Lubricant	ROV Workshop Fire Cabinet, Pit
Dow Corning 4	Electrical insulating compound	ROV Workshop Fire Cabinet, Pit
Fluid Film Spray	Silicone Lubricant	ROV Workshop Fire Cabinet
Isopropanol Alcohol	Solvent	ROV Workshop Fire cabinet
Scotchkote	Electrical insulating compound	ROV Workshop Fire cabinet
3M Silicone Spray	Silicone Lubricant	ROV Workshop Fire cabinet
Synthetic AW Hydraulic Oil, ISO-22	Amsoil (AWG-05)	Hanger, Pit, Vehicles
Tap Magic Cutting Fluid	Cutting/Machining Lubricant	ROV Workshop Fire cabinet
Tap Magic Heavyweight Cutting Fluid	Cutting/Machining Lubricant	ROV Workshop Fire cabinet
Tuff Coat M	Marine Lubricant	ROV Workshop Fire cabinet
Dow Corning Molykote 111	Valve Lubricant and Sealant	ROV Workshop Fire cabinet, Pit
WD40	Lubricant	ROV Workshop Fire cabinet

Loktite	Bolt adhesive	ROV Workshop Fire cabinet
Mineral Oil	Vitrea	Hanger, Vehicles
Por-15	Paint Kit	ROV Workshop Fire cabinet
Univis HVI 13	Hydraulic Fluid	Hanger, ROV *D2*
Ultratane	Butane fuel	ROV Workshop fire cabinet
Rust-oleum	Protective Enamel	ROV Workshop fire cabinet
Flux-Off	Soldering Flux remover	ROV Workshop fire cabinet
Propane	Torch Fuel	ROV Workshop fire cabinet

C. Chemical safety and spill response procedures

All safety and spill response procedures will be handled according to OMAO guidelines and following the manufacturers MSDS which has been provided to the ship's ECO.

D. Radioactive Materials

NOT APPLICABLE TO THIS CRUISE

V. Additional Projects

A. Supplementary Projects

NASA Maritime Aerosol Network

During the cruise the marine aerosol layer observations will be collected for the NASA Maritime Aerosol Network (MAN). Observations will be made by mission personnel (as time allows) with a sun photometer instrument provided by the NASA MAN program. Resulting data will be delivered to the NASA MAN primary investigator Alexander Smirnov by the expedition coordinator. All collected data will be archived and publically available at: http://aeronet.gsfc.nasa.gov/new_web/maritime_aerosol_network.html

Equipment resides on the ship and is stewarded by the Expedition Coordinator.

See Appendix G for full Survey of Opportunity Form.

ARGO Floats

A total of 4 ARGO float deployments are requested and planned during this expedition. Final locations of these deployments will depend on weather, transit speeds, and final dive locations. Additional information and permits can be found in Appendix H.

B. NOAA Fleet Ancillary Projects

No NOAA Fleet Ancillary Projects are planned.

VI. Disposition of Data and Reports

A. Data Responsibilities

All data acquired on *Okeanos Explorer* will be provided to the public archives without proprietary rights. All data management activities shall be executed in accordance with NAO 212-15, Management of Environmental and Geospatial Data and Information

Ship Responsibilities

The Commanding Officer is responsible for all data collected for missions until those data have been transferred to mission party designees. Data transfers will be documented on NOAA Form 61-29. Reporting and sending copies of project data to NESDIS (ROSCOP form) is the responsibility of OER.

NOAA OER Responsibilities

The Expedition Coordinator will work with the *Okeanos Explorer* Operations Officer to ensure data pipeline protocols are followed for final archive of all data acquired on *Okeanos Explorer* without proprietary rights. See Appendix B for detailed data management plans.

Deliverables

1. At sea
    a. Daily plans of the Day (POD)
    b. Daily situation reports (SITREPS)
    c. Daily summary bathymetry data files
    d. Raw sonar files (EM 302, EK 60, Subbottom, ADCP)
    e. Refined SOPs for all pertinent operational activities
    f. Assessments of all activities
2. Science
    a. Multibeam raw and processed data (see appendix B for the formal cruise data management plan)
    b. XBT raw and processed data
    c. EK 60 raw data
    d. Knudsen 3260 sub-bottom profiler raw data
    e. ADCP raw data
    f. Mapping data report

Archive

OER and ship will work together to ensure documentation and stewardship of acquired data sets in accordance with NAO 212-15. The Cruise Information Management System is the primary tool used to accomplish this activity.

VII. Meetings, Vessel Familiarization, and Project Evaluations

A. Shipboard Meetings

A safety brief and overview of POD will occur on the Bridge each morning at 0800. Daily Operations Briefing meetings will be held at 1330 in the forward lounge to review the current day, and define operations, associated requirements, and staffing needs for the following day. A Plan of the Day (POD) will be posted each evening for the next day in specified locations throughout the ship. Daily Situation Reports (SITREPS) will be posted as well and shared daily through e-mail.

1. Pre-Project Meeting:

The Expedition Coordinator and Commanding Officer will conduct a meeting of pertinent members of the scientific party and ship's crew to discuss required equipment, planned operations, concerns, and establish mitigation strategies for all concerns. This meeting shall be conducted before the beginning of the project with sufficient time to allow for preparation of the ship and project personnel. The ship's Operations Officer usually is delegated to assist the Expedition Coordinator in arranging this meeting.

2. Vessel Familiarization Meeting:

The Commanding Officer is responsible for ensuring scientific personnel are familiarized with applicable sections of the standing orders and vessel protocols, e.g., meals, watches, etiquette, drills, etc. A vessel familiarization meeting shall be conducted in the first 24 hours of the project's start and is normally presented by the ship's Operations Officer.

3. Post-Project Meeting:

The Commanding Officer is responsible for conducting a meeting no earlier than 24 hrs before or seven days after the completion of a project to discuss the overall success and short comings of the project. Concerns regarding safety, efficiency, and suggestions for future improvements shall be discussed and mitigations for future projects will be documented for future use. This meeting shall be attended by the ship's officers, applicable crew, the Expedition Coordinator, and members of the scientific party and is normally arranged by the Operations Officer and Expedition Coordinator.

4. Project Evaluation Report:

Within seven days of the completion of the project, a Customer Satisfaction Survey is to be completed by the Expedition Coordinator. The form is available at https://docs.google.com/a/noaa.gov/forms/d/1a5hCCkgIwaSII4DmrHPudAehQ9HqhRqY3J_FXqbJp9g/viewform and provides a "Submit" button at the end of the form. Submitted form data is deposited into a spreadsheet used by OMAO management to analyze the information. Though the complete form is not shared with the ships, specific concerns and praises are followed up on while not divulging the identity of the evaluator.

VIII. Miscellaneous

A. Meals and Berthing

The ship will provide meals for the scientists listed above. Meals will be served 3 times daily beginning one hour before scheduled departure, extending throughout the project, and ending two hours after the termination of the project. Since the watch schedule is split between day and night, the night watch may often miss daytime meals and will require adequate food and beverages (for example a variety of sandwich items, cheeses, fruit, milk, juices) during what are not typically meal hours. Special dietary requirements for scientific participants will be made available to the ship's command at least twenty-one days prior to the survey (e.g., Expedition Coordinator is allergic to fin fish).

Berthing requirements, including number and gender of the scientific party, will be provided to the ship by the Expedition Coordinator. The Expedition Coordinator and Operations Officer will work together on a detailed berthing plan to accommodate the gender mix of the scientific party taking into consideration the current make-up of the ship's complement. The Expedition Coordinator is responsible for ensuring the scientific berthing spaces are left in the condition in which they were received; for stripping bedding and linen return; and for the return of any room keys which were issued. The Expedition Coordinator is also responsible for the cleanliness of the laboratory spaces and the storage areas utilized by the scientific party, both during the cruise and at its conclusion prior to departing the ship.

All NOAA scientists will have proper travel orders when assigned to any NOAA ship. The Expedition Coordinator will ensure that all non-NOAA or non-Federal scientists aboard also have proper orders. It is the responsibility of the Expedition Coordinator to ensure that the entire scientific party has a mechanism in place to provide lodging and food and to be reimbursed for these costs in the event that the ship becomes uninhabitable and/or the galley is closed during any part of the scheduled project.

All persons boarding NOAA vessels give implied consent to comply with all safety and security policies and regulations which are administered by the Commanding Officer. All spaces and equipment on the vessel are subject to inspection or search at any time. All personnel must comply with OMAO's Drug and Alcohol Policy dated May 7, 1999 which forbids the possession and/or use of illegal drugs and alcohol aboard NOAA Vessels.

B. Medical Forms and Emergency Contacts

The NOAA Health Services Questionnaire (NHSQ, NF 57-10-01 (3-14)) must be completed in advance by each participating scientist. The NHSQ can be obtained from the Expedition Coordinator or the NOAA website http://www.corporateservices.noaa.gov/noaaforms/eforms/nf57-10-01.pdf.

All NHSQs submitted after March 1, 2014 must be accompanied by NOAA Form (NF) 57-10-02 - Tuberculosis Screening Document in compliance with OMAO Policy 1008 (Tuberculosis Protection Program).

The completed forms should be sent to the Regional Director of Health Services at the applicable Marine Operations Center. The NHSQ and Tuberculosis Screening Document should reach the Health Services Office no later than four weeks prior to the start of the project to allow time for the participant to obtain and submit additional information should health services require it, before clearance to sail can be granted. Please contact MOC Health Services with any questions regarding eligibility or completion of either form. Ensure to fully complete each form and indicate the ship or ships the participant will be sailing on. The participant will receive an email notice when medically cleared to sail if a legible email address is provided on the NHSQ.

The participant can mail, fax, or email the forms to the contact information below. Participants should take precautions to protect their Personally Identifiable Information (PII) and medical information and ensure all correspondence adheres to DOC guidance (http://ocio.os.doc.gov/ITPolicyandPrograms/IT_Privacy/PROD01_008240).

The only secure email process approved by NOAA is Accellion Secure File Transfer which requires the sender to setup an account. Accellion's Web Users Guide is a valuable aid in using this service, however to reduce cost the DOC contract doesn't provide for automatically issuing full functioning accounts. To receive access to a "Send Tab," after your Accellion account has been established send an email from the associated email account to accellionAlerts@doc.gov requesting access to the "Send Tab" function. They will notify you via email, usually within one business day of your approval. The "Send Tab" function will be accessible for 30 days.

Contact Information:

Regional Director of Health Services
Marine Operations Center – Atlantic
439 W. York Street
Norfolk, VA 23510
Telephone: (757) 441.6320

Fax: (757) 441.3760
E-mail: MOA.Health.Services@noaa.gov

Please make sure the medical.explorer@noaa.gov email address is cc'd on all medical correspondence.

Prior to departure, the Expedition Coordinator must provide a listing of emergency contacts to the Operations Officer for all members of the scientific party, with the following information: name, address, relationship to member, and telephone number.

Emergency contact form is included as Appendix A.

C. Shipboard Safety

Hard hats are required when working with suspended loads. Work vests are required when working near open railings and during small boat launch and recovery operations. Hard hats and work vests will be provided by the ship when required.

Wearing open-toed footwear or shoes that do not completely enclose the foot (such as sandals or clogs) outside of private berthing areas is not permitted. Steel-toed shoes are required to participate in any work dealing with suspended loads, including CTD deployments and recovery. The ship does not provide steel-toed boots. Hard hats are also required when working with suspended loads. Work vests are required when working near open railings and during small boat launch and recovery operations. Hard hats and work vests will be provided by the ship when required.

Operational Risk Management: For every operation to be conducted aboard the ship (NOAA-wide initiative), risk management procedures will be followed. For each operation, risks will be identified and assessed for probability and severity. Risk mitigation strategies/measures will be investigated and implemented where possible. After mitigation, the residual risk will have to be assessed to make Go-No Go decisions for the operations. Particularly with new operations, risk assessment will be ongoing and updated as necessary. This does not only apply to over-the-side operations, but to everyday tasks aboard the vessel that pose risk to personnel and property.

- CTD, ROV (and other pertinent) ORM documents will be followed by all personnel working onboard *Okeanos Explorer*.
- All personnel onboard are in the position of calling a halt to operations/activities in the event of a safety concern.

D. Communications

A daily situation report (SITREP) on operations prepared by the Expedition Coordinator will be relayed to the program office. Sometimes it is necessary for the Expedition Coordinator to communicate with another vessel, aircraft, or shore facility. Through various modes of communication, the ship is able to maintain contact with the Marine Operations Center on an as needed basis. These methods will be made available to the Expedition Coordinator upon request, in order to conduct official business. The ship's primary means of communication with the Marine Operations Center is via e-mail and the Very Small Aperture Terminal (VSAT) link. VSAT bandwidth at 15Mbps will be paid by OER and provided by OMAO.

Specific information on how to contact NOAA Ship *Okeanos Explorer* and all other fleet vessels can be found at http://www.moc.noaa.gov/MOC/phone.html#EX

Important Telephone and Facsimile Numbers and E-mail Addresses

Ocean Exploration and Research (OER):

OER Program Administration
Phone: (301) 734-1010
Fax: (301) 713-4252
E-mail: Firstname.Lastname@noaa.gov

University of New Hampshire, Center for Coastal and Ocean Mapping

Phone: (603) 862-3438
Fax: (603) 862-0839

NOAA Ship *Okeanos Explorer* - Telephone methods listed in order of increasing expense:

Okeanos Explorer Cellular: (401) 713-4114
Okeanos Explorer Iridium:(808) 659-9179
OER Mission Iridium (dry lab): (808) 851-3827

EX INMARSAT B
Line 1: 011-870-764-852-328
Line 2: 011-870-764-852-329

Voice Over IP (VoIP) Phone:
(541) 867-8932
(541) 867-8933
(541) 867-8934

E-mail: Ops.Explorer@noaa.gov- (mention the person's name in SUBJECT field)

E-mail: expeditioncoordinator.explorer@noaa.gov for dissemination of all hands emails by Expedition Coordinator while onboard. See ET for password.

E. IT Security

1. Any computer that will be hooked into the ship's network must comply with the OMAO Fleet IT Security Policy 1.1 (November 4, 2005) prior to establishing a direct connection to the NOAA WAN. Requirements include, but are not limited to: Installation of the latest virus definition (.DAT) file on all systems and performance of a virus scan on each system.
2. Installation of the latest critical operating system security patches.
3. No external public Internet Service Provider (ISP) connections.

Completion of these requirements prior to boarding the ship is required.

Non-NOAA personnel using the ship's computers or connecting their own computers to the ship's network must complete NOAA's IT Security Awareness Course within three days of embarking.

F. Foreign National Guests Access to OMAO Facilities and Platforms

There are no foreign national guests sailing on EX1705. Scott France (Canadian) and Fernando Aragon (Colombian) are both US Legal Permanent Residents though and will require assistance with attaining "OK to Board" letters to enter American Samoa.

Appendix A

EMERGENCY CONTACT DATA SHEET–NOAA SHIP*OKEANOS EXPLORER*

Scientists sailing aboard *Okeanos Explorer* should fill out the form found at the following link location:
https://docs.google.com/a/noaa.gov/forms/d/1pcoSgPluUVxaY64CM1hJ75l1iIYirTk48G-lv37Am_k/viewform with their emergency contact information

Appendix B: Data Management Plan

Okeanos Explorer (EX1705): American Samoa, Kingman/Palmyra, Jarvis (ROV & Mapping)

Ocean Exploration and Research

OER Data Management Objectives
To ensure that data management standard operating procedures are completed and that the data are publicly accessible within 60-90 days of cruise end.

1. General Description of Data to be Managed

1.1 Name and Purpose of the Data Collection Project

Okeanos Explorer (EX1705): American Samoa, Kingman/Palmyra, Jarvis (ROV & Mapping)

1.2 Summary description of the data to be collected.

Operations will include the use of the ship's deep water mapping systems (Kongsberg EM302 multibeam sonar, EK60 split-beam fisheries sonars, Knudsen 3260 chirp sub-bottom profiler sonar, and Teledyne Acoustic Doppler Current Profilers), XBT and Underway CTD casts in support of multibeam sonar mapping operations, OER's 6000 m two-body ROV Deep Discoverer and Seirios, and the ship's high-bandwidth satellite connection for continuous real-time ship-to-shore communications.

1.3 Keywords or phrases that could be used to enable users to find the data.

Davisville, mapping survey, multibeam, multibeam backscatter, multibeam sonar, multi-beam sonar, noaa fleet, okeanos, okeanos explorer, R337, Rhode Island, scientific computing system, SCS, single beam sonar, singlebeam sonar, single-beam sonar, sub-bottom profile, water column backscatter, expedition, exploration, explorer, marine education, noaa, ocean, ocean discovery, ocean education, ocean exploration, ocean exploration and research, ocean literacy, ocean research, OER, science, scientific mission, scientific research, sea, stewardship, systematic exploration, technology, transformational research, undersea, underwater, oceans, American Samoa, Kingman Reef, Jarvis Island, Pago Pago, Hawaii, Cook Islands, Kiribati, Pacific Remote Islands Marine National Monument, PRIMNM, Palmyra Atoll, CAPSTONE, Prime Crust Zone, Pacific Monuments and Sancuaries, Central Pacific Seamounts, deep sea minerals, telestream

1.4 If this mission is part of a series of missions, what is the series name?

Okeanos ROV Cruises

1.5 Planned or actual temporal coverage of the data.

Dates: 4/27/2017 to 5/19/2017

1.6 Planned or actual geographic coverage of the data.

Latitude Boundaries:	14.28	to	21.37
Longitude Boundaries:	-170.5	to	-154

1.7 What data types will you be creating or capturing and submitting for archive?

Cruise Plan, Cruise Summary, Data Management Plan, Highlight Images, Quick Look Report, ADCP, CTD (processed), CTD (raw), Dive Summaries, EK60 Singlebeam Data, Expedition Cruise Report, HDCS, Highlight Video, Images, Multibeam (image), Multibeam (processed), Multibeam (product), Multibeam (raw), NetCDF, Raw Video

(digital), Raw video inventory logs, Sample Analysis Reports, Sample Logs, SCS Output (compressed), SCS Output (native), Water Column Backscatter, XBT (raw)

1.8 What platforms will be employed during this mission?

NOAA Ship Okeanos Explorer, Deep Discoverer ROV, SEIRIOS Camera Sled

2. Point of Contact for this Data Producing Project

Overall POC:	Ms. Kasey Cantwell, Field Operations Specialist, NOAA Office of Ocean Exploration and Research, kasey.cantwell@noaa.gov
Title:	Expedition Coordinator
Affiliation/Dept:	NOAA Office of Ocean Exploration and Research
E-Mail:	kasey.cantwell@noaa.gov
Phone:	301-734-1050

3. Point of Contact for Managing the Data

Data POC Name:	Susan Gottfried, Josh Carlson, Amanda Netburn
Title:	Stewardship Data Manager, Onboard Data Manager, Sampling Operations Data Manager
E-Mail:	susan.gottfried@noaa.gov, joshocar@gmail.com, amanda.netburn@noaa.gov

4. Resources

4.1 Have resources for management of these data been identified? True

4.2 Approximate percentage of the budget devoted to data management. (specify % or "unknown")

unknown

5. Data Lineage and Quality

5.1 What is the processing workflow from collection to public release?

SCS data shall be delivered in its native format as well as an archive-ready, documented, and compressed NetCDF4 format to NCEI-MD; multibeam data and metadata will be compressed and delivered in a bagit format to NCEI-CO

5.2 What quality control procedures will be employed?

Quality control procedures for the data from the Kongsberg EM302 is handled at UNH CCOM/JHC. Raw (level-0) bathymetry files are cleaned/edited into new data files (level-1) and converted to a variety of products (level-2). Data from sensors monitored through the SCS are archived in their native format and are not quality controlled. Data from CTD casts and XBT firings are archived in their native format. CTDs are post-processed by the data management team as a quality control measure and customized CTD profiles are generated for display on the Okeanos Atlas (explore.noaa.gov/okeanosatlas).

6. Data Documentation

6.1 Does the metadata comply with the Data Documentation Directive? True

6.1.1 If metadata are non-existent or non-compliant, please explain:

not applicable

6.2 Where will the metadata be hosted?

Organization: An ISO format collection-level metadata record will be generated during pre-cruise planning and published in an OER catalog and Web Accessible Folder (WAF) hosted at NCEI-MS for public discovery and access. The record will be harvested by data.gov.

URL: https://www.ncddc.noaa.gov/oer-waf/ISO/Resolved/2017

Meta Std: ISO 19115-2 Geographic Information with Extensions for Imagery and Gridded Data will be the metadata standard employed; a NetCDF3 standard for oceanographic data will be employed for the SCS data; the Library of Congress standard, MAchine Readable Catalog (MARC), will be employed for NOAA Central Library records.

6.3 Process for producing and maintaining metadata:

Metadata will be generated via xml editors or metadata generation tools.

7. Data Access

7.1 Do the data comply with the Data Access Directive? True

7.1.1 If the data will not be available to the public, or with limitations, provide a valid reason.

Not Applicable

7.1.2 If there are limitations, describe how data are protected from unauthorized access.

Account access to mission systems are maintained and controlled by the Program. Data access prior to public accessibility is documented through the use of Data Request forms and standard operating procedures.

7.2 Name and URL of organization or facility providing data access.

Org: National Centers for Environmental Information

URL: data.noaa.gov; explore.noaa.gov/digitalatlas

7.3 Approximate delay between data collection and dissemination. By what authority?

Hold Time: no

Authority: not applicable

7.4 Prepare a Data Access Statement

No data access constraints, unless data are protected under the National Historic Preservation Act of 1966.

8. Data Preservation and Protection

8.1 Actual or planned long-term data archive location:

Data from this mission will be preserved and stewarded through the NOAA National Centers for Environmental Information. Refer to the Okeanos Explorer FY16 Data Management Plan at NOAA's EDMC DMP Repository (EX_FY17_DMP_Final.pdf) for detailed descriptions of the processes, procedures, and partners involved in this collaborative effort.

8.2 If no archive planned, why?

not applicable

8.3 If any delay between data collection and submission to an archive facility, please explain.

30-90 days

8.4 How will data be protected from accidental or malicious modification or deletion?

Data management standard operating procedures minimizing accidental or malicious modification or deletion are in place aboard the Okeanos Explorer and will be enforced.

8.5 Prepare a Data Use Statement

Data use shall be credited to NOAA Office of Ocean Exploration and Research.

Appendix C: Categorical Exclusion

January 2017

Categorical Exclusion (CE) Determination Worksheet

Project Title: EX-17-05, American Samoa, Kingman / Palmyra, Jarvis (ROV & Mapping)

Date Review Completed: March 27, 2017

Completed by: Craig Russell, NOAA Office of Ocean Exploration and Research

Signature:

Step 1. CE applicability

1. **What is the proposed federal action?**
   The proposed action is to collect baseline mapping data using the NOAA Ship *Okeanos Explorer*'s sonar systems and to conduct baseline characterizations of unexplored areas using NOAA's two-body remotely operated vehicle (ROV) and CTD rosette system on the NOAA Ship *Okeanos Explorer*.

   The expedition will commence on April 27, 2017 in Pago Pago, American Samoa (14° 16.3' S, 170° 41.22'W) and conclude on May 19, 2017 in Honolulu, Hawaii (21° 22' 2.62"N, 157° 57' 51.32"W) to conduct operations in the vicinity of American Samoa, the Cook Islands (Marae Moana), the high seas, Kiribati, Hawaii, and the Pacific Remote Islands Maine National Monument's (PRIMNM) Jarvis Island and Kingman Reef/Palmyra Atoll Units. See Project Instructions EX-17-05 for more details.

2. **Which class of CE in Appendix E of the NAO 216-6A Companion Manual is applicable to this action and why?**
   The topical scope of this action is consistent with CE number E4 in Appendix E of the Companion Manual to NOAA Administrative Order (NAO) 216-6A:

   Activities that remotely survey or observe living resources in the field using non-invasive techniques, which have little to no potential to adversely affect the environment or interfere with organisms or habitat.

Step 2. Extraordinary Circumstances Consideration

3. **Would the action result in adverse effects on human health or safety that are not**

negligible?

No. The NOAA Ship *Okeanos Explorer* will be operating in remote deep sea areas of the Pacific Ocean. Expedition EX-17-05, an expedition of the NOAA CAPSTONE campaign, will focus operations in the Kingman and Palmyra Unit as well as Jarvis Unit of PRIMNM with some operations in American Samoa, the Cook Islands, Hawaii, and the high seas. (see ***Table 1 of EX-17-05 Project Instructions:*** *Bounding coordinates of the EX-17-05 operating area*) and does not involve any procedures or outcomes known to result in impacts on human health and safety more than would be negligible.

4. **Would the action result in adverse effects on an area with unique environmental characteristics that are not negligible?**

This survey/expedition overlaps with the following areas with unique environmental characteristics: the Pacific Remote Island Marine National Monument (PRIMNM), the National Marine Sanctuary of American Samoa (NMSAS), the territorial waters of American Samoa, and Marae Moana (Cook Islands). However, the survey effects will be negligible or less than negligible, based on determinations made by management authorities affiliated with these areas. The expedition is being planned and conducted in partnership with NOAA National Marine Fisheries Service (NMFS) Pacific Islands Regional Office (PIRO) Marine National Monument Program (MNMP) to ensure no more than negligible effects on these Pacific Island areas with unique environmental characteristics. Though NOAA research is exempted from standard permit requirements to work in the PRIMNM, OER made requests and received approvals to conduct operations in the abovementioned protected areas. :

5. **Would the action result in adverse effects on species or habitats protected by the ESA, MMPA, MSA, NMSA, or MBTA that are not negligible?**

OER has taken measures to ensure that any effects on species or habitats protected by the ESA, MMPA, MSA or NMSA meet the definition of "negligible". In January 2016, a request from OER was submitted to the NMFS PIRO Protected Resources Division to initiate consultation under Section 7 of the ESA. Accompanying this request was a biological assessment that described the planned operations proposed for 2016-2017 expeditions in the Pacific and identified all ESA-listed species, including corals, in the vicinity of the operations. On February 7, 2016, OER received a letter that concurred with our determination that these 2016-2017 operations are not likely to adversely affect ESA-listed species. The ESA Section 7 concurrence letter is provided as Appendix X in the Project Instructions document for EX-17-05.

Given the offshore focus area of our work, it is highly improbable that we will encounter marine mammals protected under the MMPA or sea birds protected under the MBTA. If we did

encounter any marine mammals or seabirds, our effect would be negligible because of the best management practices to which we adhere to avoid or minimize environmental impacts.

OER also initiated a request for a Magnuson-Stevens Essential Fish Habitat (EFH) consultation for this same series of cruises and subsequently received a determination that the proposed cruises would not will not reduce the quality and/or quantity of EFHadversely affect EFH, provided there is adherence to the OER proposed procedures and the NMFS guidance conveyed via email from NMFS PIRO's Richard Hall, dated November 30, 2016.

A request to conduct operations in the NMSAS was approved. See the response to question #4 regarding measures taken to ensure that any effects meet the definition of "negligible" with respect to the NMSA.

6. **Would the action result in the potential to generate, use, store, transport, or dispose of hazardous or toxic substances, in a manner that may have a significant effect on the environment?**
   No. The cruise operations will be in compliance with FEC 07 Hazardous Materials and Hazardous Waste Management Requirements for Visiting Scientific Parties (or superseding OMAO procedures) to ensure generation, use, storage, transport, and disposal of such substances will not result in significant impacts.

7. **Would the action result in adverse effects on properties listed or eligible for listing on the National Register of Historic Places authorized by the National Historic Preservation Act of 1966, National Historic Landmarks designated by the Secretary of the Interior, or National Monuments designated through the Antiquities Act of 1906; Federally recognized Tribal and Native Alaskan lands, cultural or natural resources, or religious or cultural sites that cannot be resolved through applicable regulatory processes?**
   During EX-17-05, we will not visit sites that fall under any of these categories.

8. **Would the action result in a disproportionately high and adverse effect on the health or the environment of minority or low-income communities, compared to the impacts on other communities (EO 12898)?**
   No, the NOAA Ship *Okeanos Explorer* will be operating in remote deep sea areas of the Pacific Ocean (see Table 1, EX 17-05 Cruise Plan Instructions). There are no communities within or near the geographic scope of the cruise, and the cruise does not involve actions known or likely to result in adverse impacts on human health.

9. **Would the action contribute to the introduction, continued existence, or spread of**

noxious weeds or nonnative invasive species known to occur in the area or actions that may promote the introduction, growth, or expansion of the range of the species?

No. During EX-17-05 the ship will not make landfall in areas other than commercial ports. The ship and OER mission team will comply with all applicable local and federal regulations regarding the prevention or spread of invasive species. At the completion of every ROV dive or CTD cast, the ROVs will be thoroughly rinsed with fresh water and completely dried to prevent spreading organisms from one site to another. Also the Engineering Department aboard the NOAA Ship *Okeanos Explorer* attends yearly Ballast Management Training in accordance with NOAA Form 57-07-13 NPDES VGP Annual Inspection and Report to prevent the introduction of invasive species.

10. **Would the action result in a potential violation of Federal, State, or local law or requirements imposed for protection of the environment?**

The proposed action **will not** result in any violations of Federal, State, or local law or requirements imposed for protection of the environment. The survey coordinators obtained (or are in the process of obtaining) authorizations and/or consultations pursuant to applicable laws. See responses to questions #4, 5, and 6 for details.

11. **Would the action result in highly controversial environmental effects?**

No. The exploration activities will be localized and of short duration in any particular area at any given time. Given this project's scope and breadth, no notable or lasting changes or highly controversial effects to the environment will result.

12. **Does the action have the potential to establish a precedent for future action or an action that represents a decision in principle about future actions with potentially significant environmental effects?**

No. While each cruise contributes to the overarching goal of exploring, mapping, and sampling the ocean, every cruise is independently useful and not connected to subsequent cruises.

13. **Would the action result in environmental effects that are uncertain, unique, or unknown?**

No. The techniques and equipment used are standard for this type of field activity.

14. **Does the action have the potential for significant cumulative impacts when the proposed action is combined with other past, present and reasonably foreseeable future actions, even though the impacts of the proposed action may not be significant by themselves?**

By definition, actions that a federal agency classifies as a categorical exclusion have no potential, individually or cumulatively, to significantly affect the environment. This cruise is consistent with a class of CE established by NOAA, and there are no extraordinary circumstances for this action that may otherwise result in potentially significant impacts.

Appendix D: ESA Section Letter of Concurrence

U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Pacific Islands Regional Office
1845 Wasp Blvd., Bldg 176
Honolulu, Hawaii 96818
(808) 725-5000 • Fax: (808) 725-5215

Mr. John McDonough
Deputy Director
NOAA Office of Ocean Exploration and Research

Dear Mr. McDonough:

This letter responds to your January 14, 2016 Request for Consultation by the Office of Exploration and Research (OER) regarding efforts aboard the NOAA vessel *Okeanos Explorer* with the proposed action consisting of activities to explore and improve understanding of the distribution and diversity of deep water habitats in the Pacific, and in particular in the Marine National Monuments. You have requested our concurrence under Section 7 of the Endangered Species Act of 1973 (ESA), as amended (16 U.S.C. §1531 et seq.), with your determination that the proposed action may affect but is not likely to adversely affect green, hawksbill, leatherback, olive ridley, and north Pacific loggerhead sea turtles; Main Hawaiian Islands false killer whale distinct population segment, humpback whales, blue whales, fin whales, sei whales, sperm whales, north Pacific right whales, the Indo-West Pacific and Central Pacific distinct population segment of the scalloped hammerhead shark, Hawaiian monk seals; and the coral species *Acropora globiceps,* A. *jacquelineae, A. retusa, A. speciosa, Euphyllia paradivisa, Isopora crateriformis,* and *Seriatopora aculeata.*

Proposed Action/Action Area: The proposed activity is more fully described in your request for consultation and the associated biological evaluation (CAPSTONE 2016). The proposed action (Okeanos Explorer cruises) includes the use of various ship and submersible-deployed electronic systems to collect data on the distribution and diversity of deep water habitats in the Marine National Monuments. The activity would occur during two years with up to 20 research cruises scheduled between February 2016 and December 2017. The expedition teams (26 crew and up to 20 rotating scientists and/or technicians on each cruise leg) would be authorized to conduct mapping and Remotely Operated Vehicle (ROV) surveys using the Okeanos Explorer's multibeam, split beam, subbottom profiler and acoustic Doppler current profiler (ADCP) sonar systems, utilizing the ship's conductivity-temperature-depth (CTD) sampling rosette for various water measurements and deploying an ROV. No activities are scheduled to occur on land.

The suite of sonars aboard the vessel includes a Kongsberg EM302 30 kHz multibeam system, which collect bathymetry and backscatter data; several Simrad EK 60 split-beam sonars that

range from 18 to 333 kHz which are designed to gather measurements of biological and gaseous targets in the water column; and a Knudsen 3.5 kHz chirp sub-bottom profiler. The 300 kHz and 38 kHz ADCPs provide information about current velocity and direction at various depths. Sonar mapping activities will be conducted throughout the proposed action area and during transits to and from sites where operations will be conducted in an effort to fill in gaps in data knowledge and to build on data already collected. The maps generated from these activities will improve understanding of the geology and important biological habitats in the project area.

Conductivity, temperature and depth data will be collected by both an Underway CTD and a CTD rosette instrument. The CTD rosette, which is deployed while the ship is stopped and holding dynamic position, is lowered by a winch and wire to a maximum depth of 6800 m to collect water samples through 24 2.5 L niskin bottles. The CTD rosette will be deployed at select sites where ROV operations are conducted to allow for an improved understanding of the environmental conditions at that particular site. The deployment and retrieval of the CTD rosette takes up to several hours (depending on depth), while the Underway CTD can be deployed while the ship is moving, saving hours of time and fuel. The instrument is mounted on the stern railing and outfitted with a re-useable probe that is deployed and retrieved through the use of motorized spool. The Underway CTD will be used to collect water column profiles to a maximum depth of 700 m.

ROV operations will be designed to provide interdisciplinary site characterization at priority targets in and around monuments, sanctuaries and protected areas, through visual observation of priority targets while acquiring environmental data with onboard sensors. Sampling will be focused on corals and sponges, but will target specimens believed to be new species or new records for an area. No ESA-listed corals would be sampled. As many as 200 deployments of the ROV may occur during the 2016 – 17 field season resulting in 1600 hours of total dive time. The dives will better enable scientists and managers to understand the diversity and distribution of deep water habitats.

The action area covered by the accompanying biological evaluation encompasses the marine environments of Papahānaumokuākea Marine National Monument (PMNM); Oahu and the big island of Hawai'i; the area south and west of Molokai, Lana'i, and Kaho'olawe, the Geologists Seamounts located about 100 nm south of Honolulu; the Musicians Seamounts located about 150 nm NNE of Nihoa Island; all of the Pacific Remote Island Areas composing the Pacific Remote Islands Marine National Monument (PRIMNM); the Commonwealth of the Northern Marianas Islands (CNMI) and the Marianas Trench Marine National Monument (MTMNM); the vicinity of American Samoa and the National Marine Sanctuary of American Samoa (NMSAS); the Rose Atoll Marine National Monument (RAMNM); and the vessel transit areas between Honolulu, Hawai'i, Guam, Saipan, Kwajalein, Pago Pago where ESA-listed marine species or their habitats may be impacted by the proposed activities.

Species That May Be Affected: OER determined that the proposed action may affect but is not likely to adversely affect green sea turtles (*Chelonia mydas*), hawksbill sea turtles (*Eretmochelys imbricata*), North Pacific distinct population segment of loggerhead sea turtles (*Caretta caretta*),

olive ridley sea turtles (*Lepidochelys olivacea*), leatherback sea turtles (*Dermochelys coriacea*), Main Hawaiian Islands false killer whale distinct population segment (*Pseudorca crassidens*), humpback whales (*Megaptera novaeangliae*), sperm whales (*Physeter macrocephalus*), fin whales (*Balaenoptera physalus*), blue whales (*Balaenoptera musculus*), sei whales (*Balaenoptera borealis*), north pacific right whales (*Eubalaena japonica)*, the Indo-West Pacific and Central Pacific distinct population segments of the scalloped hammerhead shark (*Sphryna lewini*), Hawaiian monk seals (*Neomonachus schauinslandi*), Hawaiian monk seal critical habitat and the coral species *Acropora globiceps, A. jacquelineae, A. retusa, A. speciosa, Euphyllia paradivisa, Isopora crateriformis,* and *Seriatopora aculeata.* Detailed information about the biology, habitat, and conservation status of sea turtles can be found in their recovery plans and other sources at http://www.nmfs.noaa.gov/pr/species/turtles/. The same can be found for Hawaiian monk seals and cetaceans at http://www.nmfs.noaa.gov/pr/species/mammals/; and more information on listed corals can be found at http://www.fpir.noaa.gov/PRD/prd_coral.html.

Critical Habitat: The proposed action would take place within designated monk seal critical habitat. Critical habitat was designated under the ESA for the Hawaiian monk seal on April 30, 1986 and revised on May 26, 1988 (53 FR 18988) and again on August 21, 2015 (80 FR 50926). Designated critical habitat includes all beach areas, lagoon waters, and ocean waters out to a depth of 200 m around Kure Atoll; Midway Islands (except Sand Island), Pearl and Hermes Reef, Lisianski Island, Laysan Island, Gardner Pinnacles, French Frigate Shoals, Necker Island, Maro Reef, and Nihoa Island, and includes the seafloor and all subsurface waters and habitat within 10 meters of the seafloor. Around the Main Hawaiian Islands, critical habitat extends in designated areas from the beach out to the 200 meter depth contour, and includes the seafloor and subsurface waters within 10 meters of the seafloor.

Analysis of Effects: In order to determine that a proposed action is not likely to adversely affect listed species, NMFS must find that the effects of the proposed action are expected to be insignificant, discountable, or beneficial as defined in the joint USFWS-NMFS Endangered Species Consultation Handbook: (1) insignificant effects relate to the size of the impact and should never reach the scale where take occurs; (2) discountable effects are those that are extremely unlikely to occur; and (3) beneficial effects are positive effects without any adverse effects (USFWS & NMFS 1998). This standard, as well as consideration of the probable duration, frequency, and severity of potential interactions, was applied during the analysis of effects of the proposed action on ESA-listed marine species, as is described in detail in the OER consultation request. The OER determined that the risk of collisions with vessels and the risk of entanglement would be discountable; and that the risk from exposure to elevated noise level, disturbance from human activity, as well as exposure to wastes and discharges would result in insignificant effects on ESA-listed sea turtles, marine mammals, sharks and corals; and that the potential effects of the proposed action to designated or proposed critical habitat would also be insignificant.

Considering the information and assessments presented in the OER consultation request, and in the best scientific information available about the biology and expected behaviors of the ESA-listed marine species considered in this consultation; NMFS agrees that: 1) the list of ESA-listed species and critical habitats potentially exposed to the effects of the action is correct, 2) the suite

of identified stressors is comprehensive, and 3) the assessment of exposure risk and significance of exposure to those stressors is accurate. Therefore, NMFS agrees that:

- the risk of collisions with vessels for marine mammals, turtles, sharks and the listed coral species in the action area is discountable;
- the risk of entanglement with marine mammals, sea turtles and sharks is discountable; and,
- ESA-listed species in the action area are unlikely to respond to anticipated elevated noise levels, disturbance from human activity, and exposure to wastes and discharges. Further, if any response were to occur, it would be temporary in nature and never reach the scale where it would affect the individual's health, and as such, have insignificant effects.

Conclusion: NMFS concurs with your determination that conducting the proposed Okeanos Explorer cruises are not likely to adversely affect ESA-listed marine species. This concludes your consultation responsibilities under the ESA for species under NMFS's jurisdiction. However, this consultation focused solely on compliance with the ESA. Additional compliance review that may be required of NMFS for this action (such as assessing impacts on Essential Fish Habitat) would be completed by NMFS Habitat Conservation Division in separate communication, if applicable.

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

If you have further questions please contact Richard Hall on my staff at (808) 725-5018. Thank you for working with NMFS to protect our nation's living marine resources.

Sincerely,

Michael D. Tosatto
Regional Administrator

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

NMFS File No.: PIR-2016-9774
PIRO Reference No.: I-PI-16-1347-AG

Literature Cited

Campaign to Address Pacific Monument Sciecne, Technology and ocean Needs (CAPSTONE) 2016. Request for Informal Consultation. Letter from John McDonough to Ann Garrett dated January 14, 2016 and attachments.

U.S. Fish and Wildlife Service and National Marine Fisheries Service. 1998. Endangered Species Consultation Handbook. Procedures for Conducting Consultation and Conference Activities Under Section 7 of the Endangered Species Act.
http://www.nmfs.noaa.gov/pr/pdfs/laws/esa_section7_handbook.pdf

Appendix E: EFH Consultation Letter

Kelley Elliott - NOAA Federal <kelley.elliott@noaa.gov>

EFH Consultation Response for CAPSTONE cruises

Richard Hall - NOAA Federal <richard.hall@noaa.gov> Wed, Nov 30, 2016 at 4:21 PM
To: Kelley Elliott - NOAA Affiliate <kelley.elliott@noaa.gov>
Cc: Ian Lundgren - NOAA Affiliate <ian.lundgren@noaa.gov>, Samantha Brooke <samantha.brooke@noaa.gov>, Kasey Cantwell - NOAA Affiliate <kasey.cantwell@noaa.gov>

Kelley,

On November 14, 2016, the Office of Exploration and Research (OER), through personal communication, initiated a request for an Essential Fish Habitat consultation for a series of cruises by the NOAA Ship *Okeanos Explorer*. The cruises would run from early-December 2016 through late-September 2017, and include the waters around the Main Hawaiian Islands, the Musician Seamounts (north of Hawaii), the American Samoa Archipelago; Johnston, Howland, Baker, Jarvis, Kingman and Palmyra Atolls of the Pacific Remote Islands, and portions of the Cook Islands. The operational minimum depth during the cruises would be 250 m, with the majority of the cruise activities would be in water depths over 500 m.

The Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. 1855 et seq.) requires review of federally permitted projects for potential impacts to EFH (§305(b)). Pursuant to this authority, I have reviewed and provided comments as necessary for the Habitat Conservation Division of NOAA's Pacific Islands Regional Office.

The proposed cruises are the final legs of the larger 2-year Campaign to Address Pacific Monuments Science, Technology and Ocean Needs (CAPSTONE Project), which is designed to improve the understanding of the distribution and diversity of deepwater habitats within the Pacific monuments and protected areas.

The primary activities to be conducted during this series of cruises would be: remotely operated vehicle (ROV) dives to conduct engineering trials and sonar calibration and testing during two shakedown cruises scheduled for the waters of the Main Hawaiian Islands (no biological or geological samples would be collected); and mapping and ROV dives in the waters of American Samoa, West Samoa, the Pacific Remote Islands, the Musician Seamounts, and portions of the Cook Islands. Five cruises would be dedicated mapping cruise, resulting in 92 days of constant mapping, while six cruises would be combined ROV and mapping cruises which would result in approximately 96 ROV dives and 110 days of overnight mapping. Other activities to be performed during the cruises would include: deployment and recovery of a conductivity-temperature-depth (CTD) sampling rosette and underway CTDs, and possible deployment of Argo floats to acquire ocean chemistry data. During ROV dives various biological and geological samples would be collected.

In order to avoid/minimize impacts to EFH, the OER and the *Okeanos Explorer* have proposed to institute the following procedures:

- The vessel would employ the use of dynamic positioning during ROV dives (no anchoring);
- ROVs would be operated in a manner to avoid seafloor disturbance, and setting the ROV on the seafloor will be held to a minimum. For those situations when the ROV does make contact with the seafloor, visual observations will confirm that the area is sand, mud, or hard-bottom;
- Sample collections would be limited (typically 4 - 6 total rocks and primary biological specimens per dive) that represent new species, new records, or the dominant morphotype animal in a community. Clonal biological specimens (corals, sponges) would be subsampled; and
- Instruments deployed to collect water samples and current data (except for expendable instruments) would not be allowed to contact the seafloor;

In addition to the management practices proposed by OER and the *Okeanos Explorer*, NMFS provides the following guidance to further avoid/minimize impacts to EFH from the proposed cruise activities and vessel operations:
1. Except in an emergency, the vessel should not anchor while at sea;
2. The vessel should adhere to MARPOL discharge regulations at all times during the proposed cruises;
3. The ROV should be thoroughly rinsed between dives, allowed to dry, and checked for the presence of biological

organisms to prevent the spread of invasive or non-endemic species from one location to another.
4. The use detergents and other pollutants which may be washed into the marine environment should be avoided or held to a minimum;

Based on my review of the documents provided, and through our personal communications, NOAA Fisheries has determined that the proposed cruises of the NOAA Ship *Okeanos Explorer* would not adversely affect EFH provided adherence to OER proposed procedures and the NMFS guidance made above. Thank you for the opportunity to review the plans for the upcoming field season of the *Okeanos Explorer*, and to provide our comments. This completes your obligation to consult with our office with regards to EFH for this series of actions. If you have any questions or comments feel free to contact me at your convenience.

--
Richard Hall
Fishery Policy Analyst
Pacific Islands Regional Office
NOAA Inouye Regional Center
1845 Wasp Blvd., Building 176
Honolulu, HI 96818
808-725-5018

Appendix F: Cook Islands Diplomatic Clearances and Marae Moana Permit

Cook Islands High Commission

Note No: 097/2016-17

The Cook Islands High Commission presents its compliments to the Embassy of the United States of America and has the honour to enclose copy of research permit issued by the Cook Islands Foundation for National Research, based within the Office of the Prime Minister, for the US flagged marine research vessel the *Okeanos Explorer.*

The research permit covers the period 4th April 2017 to 5th May 2017.

The Cook Islands High Commission avails itself of this opportunity to renew to the Embassy of the United States of America the assurances of its highest consideration.

7 April 2017

WELLINGTON

Cook Islands High Commission Wellington

Encl. Copy of Research Permit

PO Box 12 242, Thorndon, 56 Mulgrave St, Wellington, New Zealand. Ph (04) 472 5126 Fax (04) 472 5121

Open with

PERMIT TO UNDERTAKE

Research in the Cook Islands

This is to certify that: **Mr Russell Craig**

Has permission from the Foundation for National Research to do a research in the Cook Islands from: **4 April 2017 – 5th May 2017**

On the island(s) of: **Research will be done within and North of the Islands EEZ**

The topic of research is: **Campaign to address Pacific Monument Science, Technology and Ocean Needs (CAPSTONE)**

The Cook Islands Associate Researcher is: **Ms Jacqueline Evans**

The following special conditions apply to this research:

- The researcher complies with the Cook Islands Immigration, Ministry of Marine Resources and National Environment Services requirements

- The researcher provides a preliminary report to the Office of the Prime Minister at the earliest

-The researcher provides three (3) hard copies + one (1) e-copy of the final output generated from this research to the Office of the Prime Minister by June 2019.

Permit Issued on: **09 March 2017** Issued by: **Elizabeth Koteka**

CHAIRPERSON

Receipt Number: N/A

Reference Number: 05-17 **Signed:** _____

For enquiries concerning this permit, please quote the Name of the Researcher and the Reference Number to the Chairperson, Foundation for National Research, and Office of the Prime Minister, Rarotonga, and COOK ISLANDS. Phone (682) 29 300, Fax (682) 20 856, or Email: elizabeth.wright@cookislands.gov.ck Website: www.pmoffice.gov.ck

COOK ISLAND RESEARCH COMMITTEE
OFFICE OF THE PRIME MINISTER
PRIVATE BAG, RAROTONGA, COOK ISLANDS
Phone +682 211-50 Facsimile +682 20-856
Email: elizabeth.wright@cookislands.gov.ck Web: www.cook-islands.gov.ck

File ref: 510.3
Letter no: 17-005

09 March 2017

Mr Russel Craig
Program Manager, Okeanos Explorer Explorations
Office of Ocean Exploration and Research
Seattle, WASHINGTON
United States of America

Kia Orana Mr Russell,

RE: APPROVED RESEARCH APPLICATION

I am pleased to advise that the National Research Committee has granted approval for your research titled **"Campaign to address Pacific Monument Science, Technology and Ocean Needs (CAPSTONE)" within and North of the Islands EEZ** from **04 April 2017** to **05 May 2017.**

Enclosed is your research permit issue **# 05/17**

The following conditions listed below have been imposed by the National Research Committee

- **The researcher complies with the Cook Islands Immigration**
- **The researcher provides a preliminary report to the Office of the Prime Minister at the earliest**
- **The researcher provides three (3) hard copies + one (1) e-copy of the final output generated from this research to the Office of the Prime Minister by June 2019.**

Kia Manuia

Elizabeth Wright-Koteka
CHAIRPERSON

PERMIT TO UNDERTAKE

RESEARCH IN THE COOK ISLANDS

This is to certify that: **Mr Russell Craig**

Has permission from the Foundation for National Research to do a research in the Cook Islands from: **April 2017 – May 2017**

On the Island(s) of: **Within and North of the Cook Islands EEZ**

The topic of research is: **Campaign to address Pacific Monument Science, Technology and Ocean Needs (CAPSTONE)**

The Cook Islands Associate Researcher is: **Ms Jacqueline Evans**

The following special conditions apply to this research:

-The researcher complies to the Ministry of Marine Resources and National Environment Services requirements

-The researcher provides three (3) hard copies + one (1) e-copy of the final output generated from this research to the Office of the Prime Minister by June 2017.

Permit Issued on: **09 March 2017** Issued by: **Elizabeth Koteka**

CHAIRPERSON

Receipt Number: **N/A**

Reference Number: **05-17** **Signed:**

For enquiries concerning this permit,
please quote the Name of the Researcher and the Reference Number
to the Chairperson, Foundation for National Research and Office of the Prime Minister,
Rarotonga, and COOK ISLANDS. Phone (682) 29 300, Fax (682) 20 856, or
Email: elizabeth.wright@cookislands.gov.ck Website: www.pmoffice.gov.ck

Appendix G: American Samoa and National Marine Sanctuary of American Samoa Permits

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SERVICE
National Marine Sanctuary of American Samoa
P.O. Box 4318
Pago Pago, AS 96799

January 19, 2017

MEMORANDUM FOR: THE RECORD

FROM: Gene Brighouse
National Marine Sanctuary of American Samoa

SUBJECT: Decision Memo for Permit # NMSAS-2017-001

The National Oceanic and Atmospheric Administration's National Marine Sanctuary Program (NMSP) has decided to issue permit number NMSAS-2017-001 to Kelley Elliott for the project entitled: 2017 American Samoa Expedition. This memorandum documents the rationale for this decision and compliance with all required consultations generated by this action.

BACKGROUND

Project Summary:
NOAA Ship Okeanos Explorer is the nation's first and only federal vessel with a mandate to systematically explore our mostly unknown ocean for the purpose of discovery and the advancement of knowledge. Operating under a partnership with NOAA's Office of Ocean Exploration and Research and the Office of Marine and Aviation Operations, the 2017 CAPSTONE American Samoa Expedition is a part of a major multi-year foundational science effort focused on deepwater areas of U.S. marine protected areas (MPAs) in the central and western Pacific. The overarching goal of the CAPSTONE project is to extend and improve the understanding of the distribution and diversity of deepwater habitats within MPAs, and collect data and information to support priority monument and sanctuary science and management needs.

Data and information from the Expeditions will provide a foundation of publicly-accessible baseline information to improve management and spur further exploration and research. Like previous expeditions in the Gulf of Mexico, western Atlantic, Hawai'i and Indonesia, NOAA will work with the scientific community and public to characterize unknown and poorly-known areas through telepresence-based exploration. Operations will use the ship's deep water mapping systems, NOAA's 6000m remotely operated vehicles (ROV), underway CTD, CTD rosette, and a high-bandwidth satellite connection for real-time ship to shore communications.

We propose to conduct activities in and around the National Marine Sanctuary of American Samoa to explore and improve understanding of the distribution and diversity of deep water habitats. The activity would occur during five cruises from February 1 to April 30, 2017. Operations will be focused in 250 m and deeper. No activities would occur on land.

Direct impacts:
A standard suite of operations are conducted on Okeanos Explorer and have been determined to not have the potential to result in any lasting changes to the environment. As defined in Sections 5.05 and 6.03.c.3 (a) of NAO 216-6, this is a research project of limited size or magnitude or with only short-term effects on the environment and for which any cumulative effects are negligible. Full details of the potential short-term impacts are described in the attached Categorical Exclusion.

Indirect impacts:
No indirect impacts on sanctuary resources will result from this activity.

Cumulative impacts:
A standard suite of operations are conducted on Okeanos Explorer and have been determined to not have the potential to result in any lasting changes to the environment. As defined in Sections 5.05 and 6.03.c.3 (a) of NAO 216-6, this is a research project of limited size or magnitude or with only short-term effects on the environment and for which any cumulative effects are negligible. Full details of the potential short-term impacts are described in the attached Categorical Exclusion.

Site-specific impacts and review criteria:
Activity shall be conducted with adequate safeguards for the environment. Environment shall be returned to, or will regenerate to, the condition which existed before the activity occurred.

NATIONAL ENVIRONMENTAL POLICY ACT

Categorical Exclusion:
After reviewing NOAA Administrative Order (NAO) 216-6, including the criteria used to determine significance, the NMSP has concluded that the issuance of this permit would not have a significant effect, individually or cumulatively, on the human environment. Further, we have determined that the proposed action is categorically excluded from the requirement to prepare an environmental assessment or environmental impact statement in accordance with Section 6.03c.3(a) Research Program of NAO 216-6, specifically:

The proposed research activity is of limited size and magnitude and, based on analysis of past projects in the permitted activity area, has been found to have negligible cumulative effects. I certify that this action is not likely to result in significant impacts as defined at 40 CFR 1508.27 and is not an exception to this CE category as defined by section 5.05c of NAO 216-6.

Based on this, the NMSP has concluded that an environmental assessment is not warranted for the issuance of this permit.

MAGNUSON-STEVENS ACT / ESSENTIAL FISH HABITAT

Section 305(b) (2) of the Magnuson-Stevens Fishery Conservation and Management Act requires any federal action agency to complete an Essential Fish Habitat consultation for any action authorized by the agency that may adversely affect EFH. The issuance of this permit will

adversely impact designated EFH within National Marine Sanctuary of American Samoa. Therefore, consultation with NMFS Pacific Islands Regional Office was conducted on November 30, 2016. Recommendations to minimize or mitigate for impacts to EFH have been taken into consideration and incorporated into the final action.

MARINE MAMMAL PROTECTION ACT

The issuance of this permit is not likely to result in the take of any marine mammal protected under the Marine Mammal Protection Act. Therefore, a separate permit to take a marine mammal is not required.

COASTAL ZONE MANAGEMENT ACT

The NMSP has determined that the proposed activity is not reasonably likely to affect any land or water use or natural resource of the coastal zone of American Samoa. In addition, national marine sanctuary permits and authorizations are not listed under the American Samoa Coastal Zone Management Program (CZMP) as activities that generally require a consistency determination. Furthermore, American Samoa CMP has not contacted the NOAA Office of Ocean and Coastal Resource Management with a request to review this permit. Therefore, a federal consistency determination is not required for this action.

ENDANGERED SPECIES ACT

The NMSP has determined that the proposed activity is not likely to adversely affect ESA-listed marine species. Consultation with the National Marine Fisheries Service Pacific Islands Regional Office as required by Section 7 of the Endangered Species Act was conducted on January 14, 2016. Recommendations generated through consultation have been taken into consideration and incorporated into the final action.

NATIONAL HISTORIC PRESERVATION ACT

Section 106 of the National Historic Preservation Act requires federal agencies to consider the impact of their actions on historic properties. The NMSP has determined that the proposed activity is not likely to affect any historic properties. No consultations with the Advisory Council on Historic Preservation, State Historic Preservation Officer, or Tribal Historic Preservation Officer were conducted.

OTHER CONSULTATIONS

No other consultations were required or considered for this action.

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SERVICE

National Marine Sanctuary of American Samoa
P.O. Box 4318
Pago Pago, AS 96799

NATIONAL MARINE SANCTUARY of AMERICAN SAMOA
RESEARCH PERMIT

Permittee:
Ms. Kelley Elliott
NOAA Office of Ocean Exploration and Research (OER
1315 East-West Hwy
SSMC3 Room 10262
Silver Spring, MD 20910

Permit Number: NMSAS-2017-001
Effective Date: February 1, 2017
Expiration Date: April 30, 2017

Project Title: 2017 American Samoa Expedition

This permit is issued for activities in accordance with the National Marine Sanctuaries Act (NMSA), 16 USC §1431 *et seq.*, and regulations thereunder (15 CFR Part 922). All activities must be conducted in accordance with those regulations and law. No activity prohibited in 15 CFR Part 922 is allowed except as specified in the activity description below.

Subject to the terms and conditions of this permit, the National Oceanic and Atmospheric Administration (NOAA), Office of National Marine Sanctuaries (ONMS) hereby authorizes the permittee listed above to conduct research activities within National Marine Sanctuary of American Samoa (NMSAS or sanctuary). All activities are to be conducted in accordance with this permit and the permit application received January 03, 2017. The permit application is incorporated into this permit and made a part hereof; provided, however, that if there are any conflicts between the permit application and the terms and conditions of this permit, the terms and conditions of this permit shall be controlling.

Permitted Activity Description:
The following activities are authorized by this permit:

Permitted research activities utilizing methods as described in the research application include: Damaging, destroying or possessing any invertebrate, coral, bottom formation or marine plant; Alteration of seabed; collection of bottom-dwelling species throughout the sanctuary.

Specimens to be collected are very unlikely to already reside in a repository as the dives and collections are discovery-based. Only very selective specimens that have the potential to contribute significant scientific discoveries will be collected during ROV operations. Biologic samples will focus on potential new species or new records for the region, and the dominant morphotype animal (such as a coral or sponge) in a habitat. Selective rock specimens, that have the potential to contribute significant scientific discoveries, as outlined in the expedition goals, will also be targeted. These are expected to include rocks from seamounts and manganese-coated rocks.

When possible, only a sub-sample will be taken of biologic specimens (e.g., only a piece or branch of corals and sponges will be collected, not the entire organism). When possible, rock samples will be selected in a way to minimize disturbance to the surrounding environment and to minimize the take of attached organisms. All samples will be preserved onboard and made freely and publicly accessible to the science community through National Repositories.

No further violation of sanctuary regulations is allowed.

Permitted Activity Location:
The permitted activity is allowed only in the following location(s):

Throughout the sanctuary.

Special Terms and Conditions:

The permittee may not anchor within the Sanctuary boundaries.

The permittee may not permanently mark any of the reefs.

The permittee shall submit an annual report of all activities conducted under this permit to the NMSAS Permit Coordinator no later than one year from completion of field activities. The report should include a synopsis of research results to date, as well as information regarding daily activities such as location (latitude and longitude) and depth of surveys, discovery or disturbance of historical artifacts, or equipment lost. Appropriate photographs that may be used by NOAA are appreciated, and will be credited to the photographer.

Any scientific publications and/or reports resulting from activities conducted under the authority of this permit must include the notation that the activity was conducted under permit number NMSAS-2017-001. Additionally, the permittee and his/her respective institution(s) are required to acknowledge during any media coverage (press releases, video/photo, or other means) that the research activities occurred within the NMSAS and under permit.

NOAA reserves the right to place an observer aboard the ship engaged in operations conducted under this permit. The NOAA observer(s) may document the permittee's activities for the purpose of determining whether the permitted activities are conducted in accordance with the terms and conditions of this permit and the applicable statute and regulations. The NOAA observer(s) may also provide limited advice and technical assistance, if requested by the permittee. The NOAA observer(s) will not be present for the purpose of safety of permittees, nor for the purpose of approval of activities not specifically authorized by this permit.

General Terms and Conditions:

1. Within 30 (thirty) days of the date of issuance, the permittee must sign and date this permit for it to be considered valid. Once signed, the permittee must send copies, via mail or email, to the following individuals:

Gene Brighouse	National Permit Coordinator
Superintendent	NOAA Office of National Marine Sanctuaries
National Marine Sanctuary of American Samoa	1305 East-West Highway (N/ORM6)
P.O. Box 4318	SSMC4, 11th Floor
Pago Pago, AS 96799	Silver Spring, MD 20910
Gene.Brighouse@noaa.gov	nmspermits@noaa.gov

2. It is a violation of this permit to conduct any activity authorized by this permit prior to the ONMS having received a copy signed by the permittee.

3. This permit may only be amended by the ONMS. The permittee may not change or amend any part of this permit at any time. The terms of the permit must be accepted in full, without revision; otherwise, the permittee must return the permit to the sanctuary office unsigned with a written explanation for its rejection. Amendments to this permit must be requested in the same manner the original request was made.

4. All persons participating in the permitted activity must be under the supervision of the permittee, and the permittee is responsible for any violation of this permit, the NMSA, and sanctuary regulations for activities conducted under, or in junction with, this permit. The permittee must assure that all persons performing activities under this permit are fully aware of the conditions herein.

5. This permit is non-transferable and must be carried by the permittee at all times while engaging in any activity authorized by this permit.

6. This permit may be suspended, revoked, or modified for violation of the terms and conditions of this permit, the regulations at 15 CFR Part 922, the NMSA, or for other good cause. Such action will be communicated in writing to the applicant or permittee, and will set forth the reason(s) for the action taken.

7. This permit may be suspended, revoked or modified if requirements from previous ONMS permits or authorizations issued to the permittee are not fulfilled by their due date.

8. Permit applications for any future activities in the sanctuary or any other sanctuary in the system by the permittee might not be considered until all requirements from this permit are fulfilled.

9. This permit does not authorize the conduct of any activity prohibited by 15 CFR § 922, other than those specifically described in the "Permitted Activity Description" section of this permit. If the permittee or any person acting under the permittee's supervision

conducts, or causes to be conducted, any activity in the sanctuary not in accordance with the terms and conditions set forth in this permit, or who otherwise violates such terms and conditions, the permittee may be subject to civil penalties, forfeiture, costs, and all other remedies under the NMSA and its implementing regulations at 15 CFR Part 922.

10. Any publications and/or reports resulting from activities conducted under the authority of this permit must include the notation that the activity was conducted under National Marine Sanctuary Permit NMSAS-2017-001 and be sent to the ONMS officials listed in general condition number 1.

11. This permit does not relieve the permittee of responsibility to comply with all other federal, state and local laws and regulations, and this permit is not valid until all other necessary permits, authorizations, and approvals are obtained. Particularly, this permit does not allow disturbance of marine mammals or seabirds protected under provisions of the Endangered Species Act, Marine Mammal Protection Act, or Migratory Bird Treaty Act. Authorization for incidental or direct harassment of species protected by these acts must be secured from the U.S. Fish and Wildlife Service and/or NOAA Fisheries, depending upon the species affected.

12. The permittee shall indemnify and hold harmless the Office of National Marine Sanctuaries, NOAA, the Department of Commerce and the United States for and against any claims arising from the conduct of any permitted activities.

13. Any question of interpretation of any term or condition of this permit will be resolved by NOAA.

Your signature below, as permittee, indicates that you accept and agree to comply with all terms and conditions of this permit. This permit becomes valid when you, the permittee, countersign and date below. Please note that the expiration date on this permit is already set and will not be extended by a delay in your signing.

Kelley R. Elliott 1-26-17

Ms. Kelley Elliott Date
NOAA Office of Ocean Exploration and Research (OER

1-19-17

Genie Brighouse Date
Superintendent
National Marine Sanctuary of American Samoa

0 document(s) attached.

DEPARTMENT OF MARINE AND WILDLIFE RESOURCES
AMERICAN SAMOA GOVERNMENT
P.O. BOX 3730
Pago Pago, AS 96799 U.S.A.

SCIENTIFIC STUDY & COLLECTION PERMIT APPLICATION

This application must be completed prior to all scientific studies requiring the observation, collection, handling, &/or manipulation of live or dead entities of both marine and wildlife species whether in part or in whole.

NAME OF APPLICANT: Kelley P. Elliott
ADDRESS: 1315 East-West Hwy, SSMC3 RM 10262, Silver Spring, MD 20910, USA
EMAIL ADDRESS: Kelley.Elliott@noaa.gov
INSTITUTIONAL AFFILIATION: U.S. Department of Commerce, National Oceanic and Atmospheric Instution, Office of Ocean Exploration and Research
INSTITUTIONAL ADDRESS: 1315 East-West HWY, SSMC3 10th Floor, Silver Spring MD 20910

TITLE OF STUDY: 2017 CAPSTONE American Samoa Expedition

OBJECTIVES OF STUDY:
NOAA Ship *Okeanos Explorer* is the nation's first and only federal vessel with a mandate to systematically explore our mostly unknown ocean for the purpose of discovery and the advancement of knowledge. The 2017 CAPSTONE American Samoa Expedition is a part of a major multi-year foundational science effort focused on deepwater areas of U.S. marine protected areas (MPAs) in the central and western Pacific. The overarching goal of the multi-year CAPSTONE project is to extend and improve the understanding of the distribution and diversity of deepwater habitats within MPAs, and collect data and information to support priority monument and sanctuary science and management needs.

The fundamental driver of the multi-leg American Samoa Expedition is to better understand unknown and poorly known areas of our ocean which include diverse living marine resources, and unique geologic phenomena. Data and information from the cruises will build on previous work, and provide a foundation of baseline data to improve management and spur further exploration and research. NOAA priorities for the work include a combination of science, education, outreach, and open data objectives that will support management decisions at multiple levels.

- Acquire data to support priority Monument and Sanctuary science and management needs;
- Explore the diversity of benthic habitats and features (e.g. seamounts, hydrothermal vents, deep-sea coral habitats, bottom fish habitats);
- Identify and map vulnerable marine habitats – particularly high-density deep-sea coral and sponge communities;

- Investigate the geologic history of Pacific seamounts, including potential relevance to plate tectonics and subduction zone biology and geology; and
- Engage a broad spectrum of the scientific community and public in telepresence-based exploration; and
- Provide a foundation of publicly accessible data and information products to spur further exploration, research, and management activities.

Operations will use the ship's deep water mapping systems, NOAA's 6000m remotely operated vehicles (ROV), Conductivity Temperature Depth (CTD) rosette, underway CTD, and a high-bandwidth satellite connection for real-time ship to shore communications. Like previous expeditions in the Gulf of Mexico, western Atlantic, Hawai'i and Indonesia, NOAA will work with the scientific community and public to characterize unknown and poorly-known areas through telepresence-based exploration. Data and information from the Expedition will be made publicly available to provide a foundation of publicly-accessible baseline information to improve management and spur further exploration and research.

We propose to conduct activities within the American Samoa Exclusive Economic Zone, including within the Rose Atoll Marine National Monument, the National Marine Sanctuary of American Samoa and within territorial waters to explore and improve understanding of the distribution and diversity of deep water habitats. The activity would occur during five cruises from February 1 to April 30, 2017. Operations will be focused in 250 meters and deeper. No activities would occur on land.

DESCRIPTION OF SPECIMEN(S) TO BE COLLECTED, IF ANY:
During ROV operations, only very selective specimens that have the potential to contribute significant scientific discoveries will be collected. On average only 4-6 total biological and geological specimens will be collected per dive. Biologic samples will focus on potential new species or new records for the region, and the dominant morphotype animal (such as a coral or sponge) in a habitat. When possible, only a sub-sample will be taken of biologic specimens (e.g., only a piece or branch of corals and sponges will be collected, not the entire organism). Selective rock specimens, that have the potential to contribute significant scientific discoveries, as outlined in the expedition goals, will also be targeted. These are expected to include rocks from seamounts and manganese-coated rocks. When possible, rock samples will be selected in a way to minimize disturbance to the surrounding environment and to minimize the take of attached organisms. All samples will be preserved onboard and made freely and publicly accessible to the science community through National Repositories.

Water samples may also be collected using our CTD rosette instrument. The CTD instrument package is used to obtain conductivity, temperature, depth and other oceanographic data (dissolved oxygen, light scattering, oxygen reduction potential). At least one, and potentially several, CTD casts are planned for this cruise. CTD casts would be conducted at selected sites including locations where ROV dives are conducted to allow for an improved understanding of the environmental conditions by measuring the physical or chemical properties of the water column overlying or hosting a particular habitat. No water samples have been requested at this time, however if they are requested and collected they would likely be frozen for later analysis. The results from any analysis would be made publicly available.

DESCRIBE COLLECTION METHODS TO BE USED:

ROV Operations: biological and geological specimens

The purpose of conducting ROV operations is to conduct interdisciplinary site characterization at priority targets in American Samoa. Interdisciplinary site characterization would be achieved by visually surveying priority targets while simultaneously acquiring environmental data with in situ sensors mounted on the ROVs (conductivity, temperature and depth; dissolved oxygen; light scattering; and oxygen reduction potential). ROV targets include seamounts, hydrothermal vents, deep-sea coral and sponge communities and bottom fish habitats. The combined dives will enable scientists and managers to have a better understanding of the diversity and distribution of deep water habitats in American Samoa including the Rose Atoll Marine National Monument and National Marine Sanctuary of American Samoa, and should contribute to enhanced protection of these resources.

The *Okeanos Explorer* is equipped with a dedicated, fully integrated, two-body ROV system. ROV operations are conducted primarily during daylight hours while the vessel is stopped and holding station using dynamic positioning. ROV operations will typically take place within several meters of the seafloor, and are conducted in a way to minimize seafloor disturbances. On occasion, the ROV is set down on the seafloor in order to acquire very close imagery of habitats or features of interest or to collect samples. The ROV also has a temperature probe that may be shallowly inserted into the seafloor sediment to measure the depth or temperature of features of interest.

During these dives, limited sampling operations are planned with the ROV to collect very selective specimens that have the potential to contribute significant scientific discoveries. These specimens would be collected using the ROV's manipulator arms or scoop. Biological specimen collections will focus on potential new species or new records for the region, and the dominant morphotype animal (such as a coral or sponge) in a habitat. When possible, only a sub-sample will be taken of biological specimens (e.g., only a piece or branch of corals and sponges will be collected, not the entire organism). Selective rock specimens, that have the potential to contribute significant scientific discoveries, as outlined in the expedition goals, will also be targeted. These are expected to include rocks from seamounts and manganese-coated rocks. When possible, rock samples will be selected in a way to minimize disturbance to the surrounding environment and to minimize the take of attached organisms. On average only 4-6 total biological and geological specimens will be collected per dive.

CTD Rosette: water samples and sensor data

Water samples may also be collected using our CTD rosette instrument. The CTD instrument package is used to obtain conductivity, temperature, depth and other oceanographic data (dissolved oxygen, light scattering, oxygen reduction potential). The instrument is attached to an open cylindrical steel frame approximately 1.15 m in diameter and 1.4 m high with a 24-position rosette carousel containing 24 2.5 L Niskin bottles for collecting water samples. The system would be lowered to a maximum depth of 6800 m by an embedded scientific winch and wire while the vessel would be stopped and hold station using dynamic positioning. The average time to conduct a CTD casts varies from one to several hours depending on water depth (the CTD is

lowered through the water column at 60m/min). CTD casts would be conducted at selected sites including locations where ROV dives are conducted to allow for an improved understanding of the environmental conditions by measuring the physical or chemical properties of the water column overlying or hosting a particular habitat. No water samples have been requested at this time, however if they are collected they would likely be frozen for later analysis. The results from any analysis would be made publicly available.

Mapping Operations: acoustic data

The ship will conduct sonar mapping operations at all times during non-ROV or non-CTD rosette operations throughout the cruise. NOAA Ship *Okeanos Explorer* has a suite of scientific sonars, each with a unique exploration application. All of these systems are routinely used by the ocean science community and have provided invaluable scientific data for oceanographers, marine researchers and managers. Each sonar's acoustic signal is designed to be narrowly focused to provide precise information about a specific, narrowly defined area of the seafloor or water column beneath the ship. The sonars include a Kongsberg EM302 30 kHz multibeam system; 18 kHz, 38 kHz, 70 kHz, 120 kHz, 200 kHz and 333 kHz Kongsberg EK60 split-beam fisheries sonars (the 333 kHz and 38 kHz will not be operational since we don't currently have the hardware general purpose transceiver to run it, but is included just in case); a Knudsen 3.5 kHz chirp sub-bottom profiler sonar; and 300 kHz and 38 kHz Teledyne Acoustic Doppler Current Profilers (ADCPs). The multibeam maps broad swaths for seafloor bathymetry/backscatter and water column feature detection (e.g. gaseous seeps), the split-beam sonars gather calibrated target strength measurements of biologic and gaseous targets in the water column, the sub-bottom profiler provides data useful for interpreting sub-seafloor geology, and the ADCPs provide information about current velocity and direction at various depths through a water column profile. Additionally, expendable bathythermographs (XBTs) and the ship's UnderwayCTD (UCTD) will be deployed at regular intervals in association with multibeam data collection. All of these systems are routinely used by this exploration vessel.

DURATION OF STUDY OR COLLECTION PERIOD:

The activity would occur during five cruises from February 1 to April 30, 2017. The requested dates cover a conservative estimate of the timing that NOAA Ship *Okeanos Explorer* will arrive in American Samoa and can commence work in the region, through a few days after the last cruise departs and is likely to conduct work in American Samoa. During the cruises, 15 deployments of the ROV are planned in American Samoan waters, resulting in 120 hours total dive time (~8 hours for each dive). The Expedition cruise legs, dates and focus areas are below:

EX-17-01 (January 18 – February 10, 2017): 24-day mapping cruise from Honolulu, HI to Pago Pago, American Samoa with focused mapping work in: Kingman/Palmyra and Jarvis units of the Pacific Remote Islands Marine National Monument (PRIMNM); the Pheonix Islands Protected Area (PIPA) part of Kiribati; Tokelau and Swains Island Unit of the National Marine Sanctuary of American Samoa (NMSAS).

EX-17-02 (February 16 – March 2, 2017. Pago Pago, American Samoa - Apia, Samoa): 14-day cruise with daytime remotely operated vehicle (ROV) dives and overnight CTD rosette and mapping operations focused on American Samoan waters.

EX-17-03 (March 7 - 29, 2017. Apia, Samoa - Apia, Samoa): A 23-day cruise with daytime remotely operated vehicle dives and overnight CTD rosette and mapping operations focused on PIPA and the Howland/Baker Unit of the PRIMNM. One dive is planned in the Swains Island unit of the National Marine Sanctuary of American Samoa at either the start or end of the cruise.

EX-17-04 (April 4 – April 21, 2017. Apia, Samoa - Pago Pago, American Samoa): An 18-day mapping cruise focused on American Samoa including unmapped or poorly mapped areas of the Rose Atoll Marine National Monument and National Marine Sanctuary of American Samoa deeper than ~250m.

EX-17-05 (April 27 – May 19, 2017. Pago Pago, AS to Honolulu, HI): A 23-day cruise with daytime remotely operated vehicle (ROV) dives and overnight CTD rosette and mapping operations focused on the Cook Islands and the Jarvis and Kingman/Palmyra Units of the PRIMNM. One dive is planned in or just outside of the Aunu'u Unit of the National Marine Sanctuary of American Samoa at the start of the cruise.

SPECIFIC LOCATION(S) OF STUDY &/or COLLECTING/SAMPLING AREA(S): Mapping, ROV and CTD rosette operations will focus in depths generally between 250 and 6,500 meters, with some mapping planned. CTD rosette operations have been requested in waters south of Tutuila and at Vailulu'u seamount. No activities would occur on land.

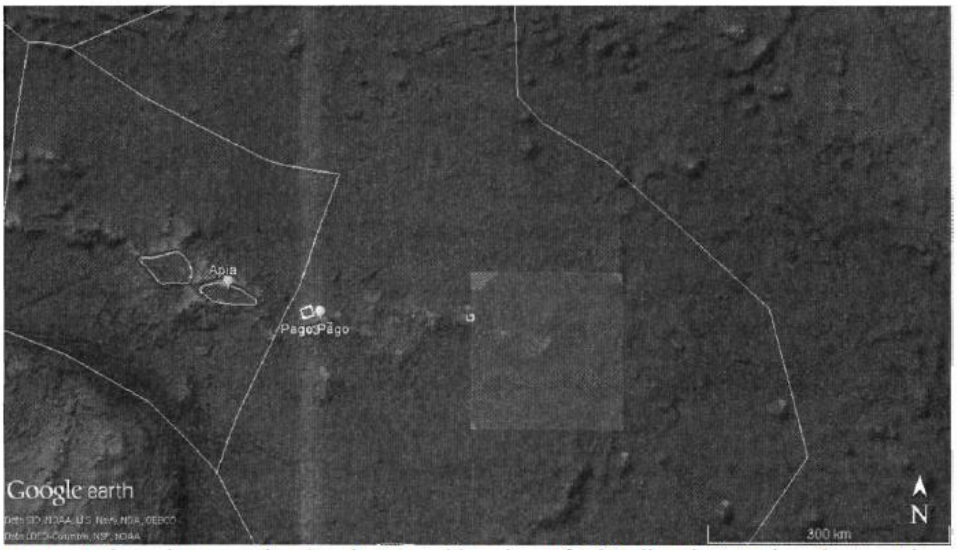

Figure 1: Overview map showing the general locations of ROV dives in American Samoa. The red dots are the draft locations of ROV dive sites, and where samples would be collected. The yellow boxes are priority areas for focused mapping surveys. Focused overnight mapping operations will be planned during the cruise based on available time. The light blue polygons are the boundaries of the Rose Atoll Marine National Monument and National Marine Sanctuary of

American Samoa. The green labelled dots are the port locations of Pago Pago, American Samoa and Apia, Samoa. The white line is the publicly available Exclusive Economic Zone of American Samoa and Samoa.

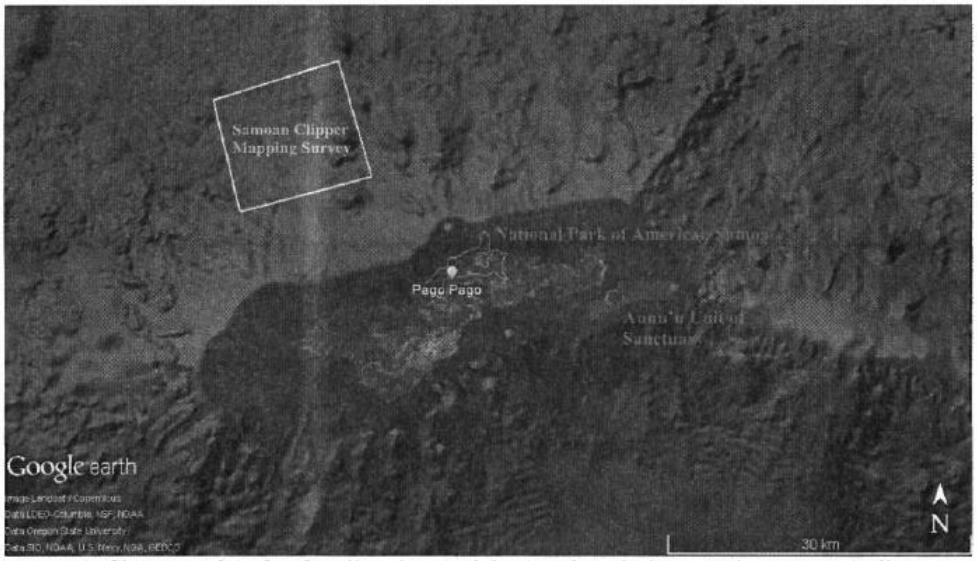

Figure 2. Close-up of draft ROV dive sites (red dots) and a priority mapping survey (yellow polygon) near Tutuila Island. The green polygon is the boundaries of the National Park of American Samoa (which extends to 100m offshore), and the light blue polygon is the Aunu'u unit of the National Marine Sanctuary of American Samoa. The requested sonar mapping survey is to support efforts to find a lost plane and maritime archaeology procedures will be employed during the survey to protect location information.

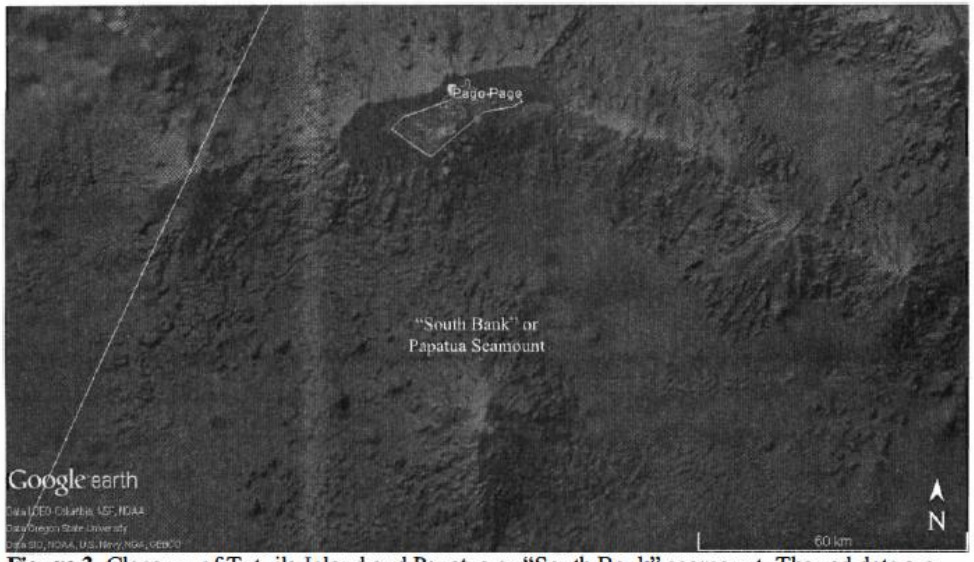

Figure 3. Close up of Tutuila Island and Papatua or "South Bank" seamount. The red dots are the locations of draft ROV dive sites.

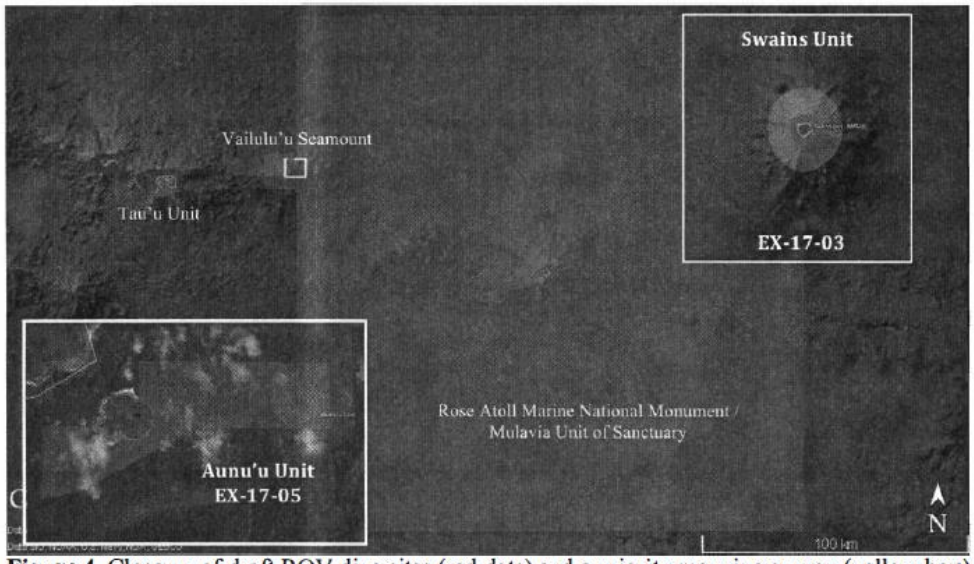

Figure 4. Close up of draft ROV dive sites (red dots) and a priority mapping survey (yellow box) within the National Marine Sanctuary of American Samoa and Rose Atoll Marine National Monument (the light blue boxes).

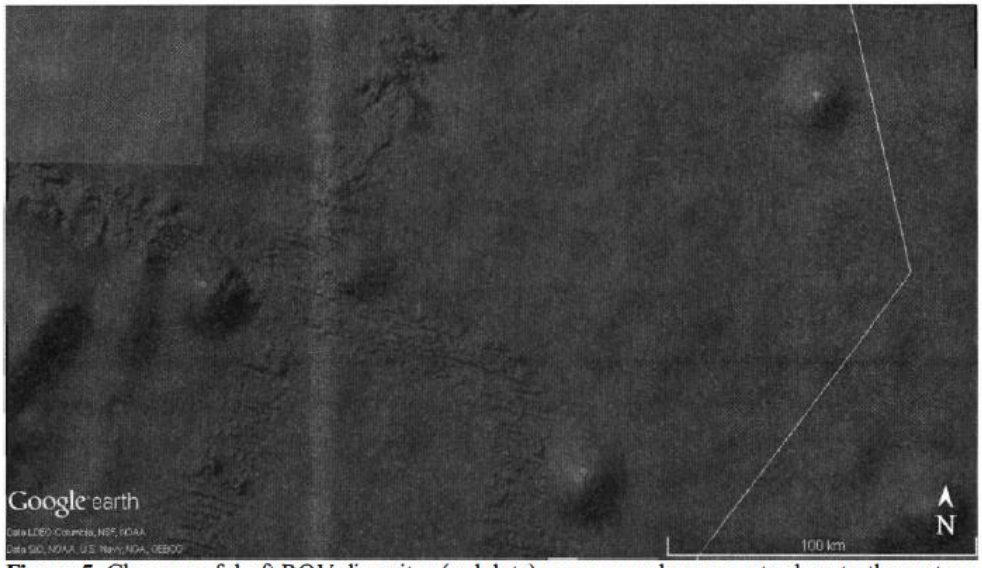

Figure 5. Close up of draft ROV dive sites (red dots) on unnamed seamounts close to the eastern edge of the American Samoa EEZ (white line). The light blue polygon is the southeast corner of Rose Atoll Marine National Monument. Mapping operations will need to be conducted overtop of the seamounts the night/morning prior to the dive to finalize the dive track.

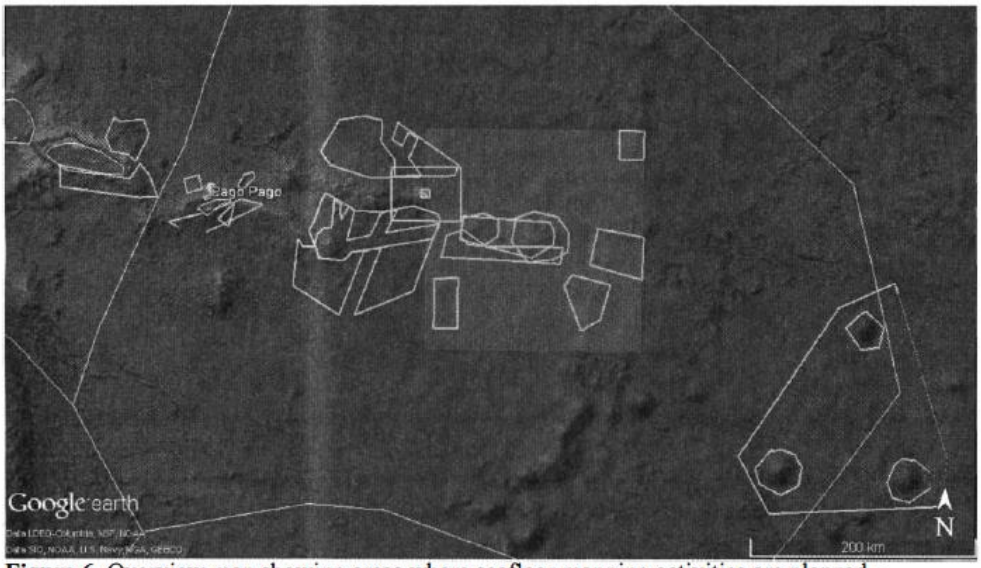

Figure 6. Overview map showing areas where seafloor mapping activities are planned – especially during EX-17-02 and EX-17-04 cruises. The orange polygons are mapping survey

areas requested by the science and management community. Mapping operations will focus on areas 250 meters and deeper.

IF HANDLING &/OR MANIPULATION OF LIVE ANIMALS, DESCRIBE PROTOCOL(S):

ROV Operations:
Once a sample is brought onboard, it will be photographed, documented, and information entered into a sample database. Rocks will be dried and photographed. Aliquots of coral and sponge specimens will be preserved for taxonomic analysis (ethanol), genetic analysis (CHAOS or other buffer), and in some cases, histological examination (10% buffered formalin). All other animals will be preserved in either formalin or ethanol, depending on which preservative is more desirable for the particular taxa.

An additional small tissue sample will be taken of all biological specimens when doing so will not be overly destructive to the specimen. This tissue sample will be preserved onboard for later genomic DNA and RNA extraction at the Ocean Genome Legacy Center (OGL) in Northeastern University.

All samples will remain on the ship until it returns to Honolulu, HI in summer 2017. The samples will then be taken to OER Science Advisor, Dr. Chris Kelley's lab at the University of Hawaii at Manoa for temporary storage. There they will be prepared and transferred to a repository (with preliminary identification provided along with photographs and a deed of gift).

IF SAMPLES COLLECTED WILL BE SUBJECTED TO FURTHER PROCESSING (e.g., genetic analysis or other biochemical analysis, museum prep), DESCRIBE HOW AND WHERE:

All biological and geological samples will be provided to a public repository to be described and made publicly accessible to the scientific research community. Scientists can then request access to the samples to conduct additional analysis, however this is outside the scope of our project.

FINAL DISPOSITION OF SAMPLES OR ANIMALS:
Selected coral and sponge specimens will be split, with one piece going to Bishop Museum in Hawaii, and the other to the Smithsonian to ensure access to as many researchers as possible. If it is determined that splitting will be too destructive to a particular specimen, it will be provided to the Smithsonian Institution intact in order to provide public access to as many researchers as possible. Crustaceans and any other organisms found on the corals and sponges will be provided to the Smithsonian. All other animals will be provided to the Smithsonian.

Tissue samples will be provided to the Ocean Genome Legacy Center (OGL) at Northeastern University. The results of genomic analysis are made publicly available through OGLs website.

All geological samples will be sent to the Oregon State University's Marine Geology Repository to be made publicly accessible. OSU will receive the samples, curate them, describe them from a

petrology point of view (e.g. mineral content, texture, alteration, rock name), microphotograph them and prepare them for future redistribution.

No water samples have been requested at this time, however if they are collected they would likely be frozen for later analysis. The results from any analysis would be made publicly available through the NOAA's National Centers for Environmental Information.

JUSTIFICATION FOR REQUEST TO COLLECT, SAMPLE, HANDLE, &/OR MANIPULATE ANIMALS OF PARTS THEREOF:
The acquisition of high-resolution seafloor mapping data is an essential precursor to making significant biological, geological, archaeological and oceanographic discoveries. The *Okeanos Explorer* cruises will collect seafloor mapping data in areas previously unmapped with sonar or modern sonar, and to supplement previous work. These maps form the basis for selecting ROV dive targets.

ROV dives take the next major step in baseline habitat characterization by using the ROV system to visually investigate unknown and little known deep water habitats within American Samoa identified as priority scientists and managers. CTD casts may be conducted to collect additional information about the physical and chemical properties of the water column, including at sites of interest identified from mapping and ROV investigation.

These dives will be the next step in a baseline habitat characterization, and directly contribute to a better understanding of the deep water habitats, ecosystems and geology of American Samoa. The dives will enable scientists and managers to have a better understanding of the diversity and distribution of deepwater habitats. It is this understanding that enables effective management decisions, and provides continuous support for the monuments, sanctuaries and their protection of these resources. The collective understanding established from the multi-year CAPSTONE expeditions will increase understanding of deep-sea biogeographic patterns across the Central and Western Pacific.

PROJECTED STARTING DATE OF STUDY:
The starting date of the first cruise is January 18th, however the ship will not arrive in American Samoan waters until early February. I have listed project dates of February 1 (the start date) to April 30, 2017. The requested dates cover a conservative estimate of the timing that NOAA Ship *Okeanos Explorer* will arrive in American Samoa and can commence work in the region, through a few days after the last cruise departs and is likely to conduct work in American Samoa. The Expedition cruise legs, dates and focus areas are detailed in the "Duration of Study or Collection Period" section above.

NAME OF LOCAL COLLABORATOR(S) &/OR LOCAL INSTITUTIONAL AFFILIATION,
Local managers have identified many of the priority sites for acoustic mapping and remotely operated vehicle dives in American Samoan waters. The names and affiliations of key partners are included below:

Genevieve (Gene) Brighouse*

National Marine Sanctuary of American Samoa, Superintendent
**We have met with the entire Sanctuary team and will be collaborating with them closely, especially on outreach activities.*

Fatima Sauafea-Le'au
NOAA Fisheries - PIRO
Habitat Conservation Division
American Samoa Field Office

Brian Peck
Rose Atoll Marine National Monument, Superintendent
Rose Atoll National Wildlife Refuge, Manager
US Fish and Wildlife Service

Dr. Tim Clark
Marine Ecologist
National Park of American Samoa

We also met with representatives from other American Samoa agencies in November 2016 to share our draft project plans and request additional input and feedback. This included Dr. Ruth Matagi-Tofiga, Director of the Department of Marine and Wildlife Resources. Other agencies and officials included the Office of Samoan Affairs, the American Samoa Governor's Coral Reef Advisory Group, American Samoa Environmental Protection Agency, and the American Samoa Power Authority.

OTHER COLLABORATING SCIENTISTS:
Dr. Chris Kelley, CAPSTONE Science Advisory, University of Hawaii at Manoa
Dr. Santiago Herrera, Biology Science Team Lead, Lehigh University
Dr. Matthew Jackson, Geology Science Team Lead, University of California Santa Barbara
Elizabeth Lobecker, Physical Scientist/Mapping Lead, NOAA Office of Ocean Exploration and Research

SIGNATURE OF APPLICANT: Kelly P. Elkins

DATE: Jan. 3, 2017

MAIL or RETURN THIS FORM TO THE ADDRESS ON THE TOP OF THE FRONT PAGE.

FOR OFFICE USE ONLY

APPLICATION SERIES No. _____

DATE APPLICATION RECEIVED: _____

RECEIVED BY: _____

APPLICATION FEE Receipt No. & Amount: _____

REVIEWER'S COMMENTS:

This is an important research initiative to explore and understand the deep-water habitats of American Samoa. These are habitats that are generally out of reach but the technologies borned by this expedition will map and sample environments and living things in the deep.

RECOMMENDED ACTION: Approve

NAME AND SIGNATURE OF REVIEWER: Dr. Domingo Ochavillo

DATE: 9 January 2017

Appendix G: NASA Maritime Aerosols Network Survey of Opportunity

Survey or Project Name

Maritime Aerosol Network

Lead POC or Principle Investigator (PI & Affiliation)

POC: Dr. Alexander Smirnov

Supporting Team Members Ashore

Supporting Team Members Aboard (if required)

Activities Description(s)(Include goals, objectives and tasks)

The Maritime Aerosol Network (MAN) component of AERONET provides ship-borne aerosol optical depth measurements from the Microtops II sun photometers. These data provide an alternative to observations from islands as well as establish validation points for satellite and aerosol transport models. Since 2004, these instruments have been deployed periodically on ships of opportunity and research vessels to monitor aerosol properties over the World Oceans.

Appendix H: ARGO Float Permits

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
OFFICE OF OCEANIC AND ATMOSPHERIC RESEARCH
1315 East-West Highway
Silver Spring, Maryland 20910

JUN 8 2000

MEMORANDUM FOR: Susan B. Fruchter
National Environmental Protection Act Coordinator

FROM: David L. Evans

SUBJECT: Categorical Exclusion, Argo Floats Project

The Office of Oceanic and Atmospheric Research is proposing to deploy Argo floats globally. Through discussions with your office and the General Counsel's Office, it has been determined that the proposed action requires a Categorical Exclusion, not an Environmental Assessment.

The proposed project would provide a consistent, global system operating within the ocean to collect the subsurface observations necessary to complement observations from space. This array will improve our ability to understand the time-varying climate system and to provide reliable ocean state and climate forecasts worldwide.

Because this action will benefit the global community with better, more reliable forecasts with no significant adverse impact to the human environment, this action is categorically excluded under NAO 216-6 from requirements to prepare an environmental document. Please contact Stephen Piotrowicz, from our Office of Scientific Support at 301-713-2465 x 124 if you have any questions regarding this issue.

Attachment

THE ASSISTANT ADMINISTRATOR

Printed on Recycled Paper

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
Silver Spring, MD 20910
OFFICE OF OCEANIC AND ATMOSPHERIC RESEARCH

MEMORANDUM FOR: THE RECORD

FROM: Donald Beran
Acting Director,
Office of Scientific Support

SUBJECT: Categorical Exclusion, Argo Floats

NAO 216-6, Environmental Review Procedures, requires all proposed projects to be reviewed with respect to environmental consequences on the human environment. This memo documents the categorical exclusion of the proposed Argo floats program from the need of an Environmental Assessment.

After reviewing NAO 216-6, including the criteria used to determine significance, we have concluded that the proposed action would not have a significant effect, individually or cumulatively, on the human environment. Further, the Argo float program will not result in any significant impact to marine life for the life of the project. Therefore, we have determined that the proposed action is categorically excluded from the requirement to prepare an environmental assessment or environmental impact statement.

BACKGROUND

To forecast individual storms, warm periods, and other day-to-day events that comprise the weather, meteorologists use observations from an extensive atmospheric observing system: a network of land and ocean surface measurements, and a sparser network of balloon-borne sensors that collect profiles of temperature, humidity, and winds at least once a day. Data collected by these networks enable accurate three- to five-day weather forecasts. Predicting climate, the broad pattern of weather over seasons and years, requires additional observations -- temperature, salinity, and currents within the upper layer of the ocean.

Every few years, the upper layer of the eastern Tropical Pacific Ocean heats up, and remains warm for months. This warming, termed El Niño alters the global atmospheric circulation, and changes the likelihood that many types of extreme weather conditions will occur. La Niña, a cooling of those same waters that sometimes follow an El Niño episode, causes a different set of weather conditions to become more likely. Each affects weather around the world.

NOAA operates the ENSO Observing System, which takes measurements from the ocean surface and its subsurface layers, and reports this information back to forecast centers in real time. Data gathered by this system, complemented by measurements from space, led to successful seasonal climate forecasts for the United

Printed on Recycled Paper

States during the 1997/98 El Niño, six months in advance.

Research has revealed that phenomena in addition to El Niño and La Niña occur in other parts of the global ocean. These also influence year-to-year climate variations. A consistent, global system operating within the ocean to collect the subsurface observations necessary to complement the observations from space is needed. The Office of Oceanic and Atmospheric Research is proposing an array of 3,000 Argo floats to be deployed globally. This array will improve our ability to understand the fluctuating climate system and to provide reliable forecasts worldwide.

The Argo floats will be spaced about 300 kilometers apart. Each float will sink to a typical depth of 2,000 meters. After drifting with the ocean current at that depth for 10 days, it will rise to the surface, measuring the temperature and salinity of the layers as it rises. On the surface, the float will transmit its data and position to an orbiting satellite before returning to depth and beginning another cycle.

Satellites will relay the data received from Argo floats to land based receiving stations. From there, the data will go to a number of scientific teams around the world, who will carry out initial quality control. They will then make the data available for operational forecast centers and scientists in near real time. The observations will be used, together with other available data, to make "weather maps" of the ocean, to initialize climate forecast models for the ocean-atmosphere system, and to improve our understanding of the ocean itself.

Argo will also be a major component of the Global Ocean Observing System (GOOS), an international effort led by the Intergovernmental Oceanographic Commission of UNESCO, the World Meteorological Organization, and the United Nations Environmental Program, with scientific guidance from the International Council of Scientific Unions. Endorsed at the Earth Summit in 1992, GOOS is an international initiative to create a global system for gathering, archiving, and distributing ocean data and derived products with worldwide utility. Its objectives include improving the management of living resources and coastal areas, ensuring safe marine navigation, and assessing the health of the ocean -- as well as laying the basis for improved understanding and forecasting of climate. Argo will provide critical data for this initiative.

This project would not result in any changes to the human environment. As defined in Section 6.03(c)3(a) of NAO 216-6 this is an action of limited size or magnitude and will not have an individual or cumulative significant impact on the quality of the human environment. As such, it is categorically excluded from the need to prepare and Environmental Assessment.

SOPAC

SOUTH PACIFIC APPLIED GEOSCIENCE COMMISSION

Tel : 381139/381377
Fax : 370040/384461
http : //www.sopac.org

Postal Address : SOPAC Secretariat
Private Mail Bag, GPO
Suva, Fiji Islands
Street Address : Mead Road, Suva, Fiji Islands

20 March 2002

Mathieu Belbeoch
ARGO Technical Co-ordinator
8-10 Rue Hermes
Parc Technologique du Canal
31526 Ramonville – Cedex
FRANCE

ARGO FLOAT DEPLOYMENTS IN THE SOPAC REGION

We hereby confirm that concurrence for the deployment of Argo floats has been provided by the following SOPAC member countries, within their EEZ's:

- Cook Islands
- Fiji
- Kiribati
- Marshall Islands
- Nauru
- New Caledonia
- Niue
- Papua New Guinea
- Samoa
- Solomon Islands
- Tonga
- Tuvalu
- Vanuatu

Yours Sincerely

Mohinish Kumar
Financial and Administrative Controller

Member Countries: Australia, Cook Islands, Federated States of Micronesia, Fiji Islands, French Polynesia (Associate), Guam, Kiribati, Marshall Islands, Nauru, New Caledonia (Associate), New Zealand, Niue, Papua New Guinea, Samoa, Solomon Islands, Tonga, Tuvalu, Vanuatu

Appendix I: Kiribati Diplomatic Clearance

FA: 48/12/053

The Ministry of Foreign Affairs and Immigration of the Republic of Kiribati presents its compliments to the Embassy of the United States of America and with reference to the Embassy's Note No. KR-065-2016, has the honour to convey the Government of the Republic of Kiribati's approval for conducting marine scientific research during the period of 25 January – 15 May 2017 with details described in the aforementioned note.

The Ministry has the further honour to advise the Embassy that no other activities to be conducted beside the proposed activity as per in the Embassy's note. The Ministry would be grateful for the Embassy's assistance to submit final detailed report of the expedition and data collected from the trip.

The Ministry has the honour to attach the approval and conditions from the PIPA for the said vessel.

The Ministry of Foreign Affairs and Immigration of the Republic of Kiribati avails itself of the opportunity to renew to the Embassy of the United States of America the assurance of its highest consideration.

Bairiki
Tarawa

26 January 2017

Embassy of the United States of America
Suva, FIJI