

Project Instructions: EX-21-03, 2021 ROV Shakedown (ROV & Mapping)

Date Submitted: June 7, 2021
Platform: NOAA Ship *Okeanos Explorer*
Project Number: EX-21-03
Project Title: 2021 ROV Shakedown
Project Dates: June 13, 2021 - June 27, 2021

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Approved by: 60199 **Dated:** _____
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Date: 2021.06.10 09:48:40 -04'00'
Captain Nicholas Chrobak
Commanding Officer
NOAA Marine Operations Center - Atlantic

I. Overview

A. Brief Summary and Project Period

June 13-27, 2021 (Norfolk, Virginia - Newport, Rhode Island) EX-21-03, 2021 ROV Shakedown (ROV/Mapping)

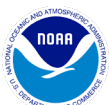
This document contains project instructions specific to EX-21-03. For more information about the overarching 2021 Field Season, refer to the linked [NOAA Ship *Okeanos Explorer* FY2021 Field Season Instructions](#). Operations for this cruise will be conducted 24 hours per day, and consist of Remotely Operated Vehicle (ROV) shakedown operations during the day and overnight mapping operations, as well as limited shore-based participation via telepresence technology. The cruise will commence on June 13, 2021 in Norfolk, Virginia and conclude on June 27, 2021 in Newport, Rhode Island. Operations will include the use of the ship's mapping systems (Kongsberg EM 304 multibeam, EK60/EK80 split-beam sonars, Knudsen 3260 chirp sub-bottom profiler, and Teledyne acoustic Doppler current profiler), expendable bathythermographs (XBTs) in support of multibeam sonar mapping operations, the two-body ROV system (*Deep Discoverer* and *Seirios*), and high-bandwidth satellite connection for continuous ship-to-shore communications. Operations will focus on exploring deep waters (>250 m for ROV operations, and >200 m for mapping operations) both within and outside of the U.S. Exclusive Economic Zone (EEZ).

B. Days at Sea (DAS)

Of the 15 DAS scheduled for this project, 15 DAS are funded by OAR allocation. This project is estimated to exhibit a high operational tempo due to 24 hour operations consisting of daily ROV dives, overnight mapping operations, and continuous shore-side participation via telepresence.

C. Operating Area

EX-21-03 is a ROV shakedown cruise focused on the operational readiness of the dual body ROV system *Seirios* and *Deep Discoverer* (D2). Overnight operations will also include mapping using the ship's suite of acoustic sonars. Operations will focus on waters off the continental shelf in the U.S. Mid-Atlantic region between Virginia and Rhode Island, and will extend outside of the U.S. EEZ to Caryn Seamount. Mapping and ROV operations will focus on exploring depths between 250 and 5,000 meters **Figure 1**.



Overarching objectives that span the entire FY21 field season are covered in the [NOAA Ship Okeanos Explorer FY2021 Field Season Instructions](#). Additional objectives specific to EX-21-03 are listed below.

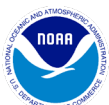
1. ROV Engineering

EX-21-03 objectives will focus primarily on the operational readiness of the ROVs. Detailed below are specific goals for this cruise as they relate to ROV engineering.

- a. Load and re-integrate ROVs *Deep Discover* and *Seirios*.
- b. Review ROV launch, recovery and emergency procedures with ROV team and ship's crew to facilitate training for new personnel and refresher training for experienced personnel.
- c. Complete a series of ROV dunk tests to practice launch and recovery evolutions.
- d. Run an ROV dive simulation to review launch and recovery operations including aftdeck controls, dynamic positioning system, and emergency recovery training as needed with new personnel and/or as requested by OER or Commanding Officer.
- e. Calibrate and test the ultrashort baseline (USBL) positioning system.
- f. Test the updated ROV hydraulic system and motors.
- g. Calibrate the motor system control software.
- h. Pilot practice with the manipulator arms.
- i. Dive at progressively deeper depths starting at approximately 1000 m and finishing at 5000 m over the course of five or more dives.
- j. Test the ROV systems and conduct pilot training when diving on benthic exploration targets and on an archaeological target.
- k. Conduct ROV operations in the water column.
- l. Test and evaluate the BlueView scanning sonar added to *Deep Discoverer*.
- m. Identify the process to export and preserve data from BlueView scanning sonar.
- n. Test new lights and controls installed on *Deep Discoverer*.
- o. Test underwater cultural heritage (UCH) procedures with new geotagging video frame capture system.
- p. Test the temperature probe functionality after re-integration into *D2*.

2. Science

- a. Train a new expedition coordinator in all cruise related roles.
- b. Dive on underexplored areas such as Caryn Seamount and Mid-Atlantic underwater canyons in the Frank R. Lautenberg Deep-Sea Coral Protection Area.



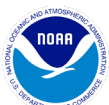
- c. Complete one UCH dive currently planned for June 26, 2021. UCH procedures can be found in Appendix G.
- d. Test ArcOnline access and utility for field use on ROV cruises.
- e. Review and test the new ethanol emergency procedures.
- f. Test the quality of the ethanol now stored in the new ejectable 02 Deck container before and after each ROV cruise.
- g. Use OER Ethanol Test guide (Appendix F) for detailed instructions on how to test the ethanol, to calculate the measurements, and record the results.
- h. Update internal OER Ethanol Testing SOP as procedures are refined.
- i. Test new dive summary metrics and integration of metrics into the dive summary form.

Remote Participation and Exploration Command Centers (ECC)

- j. Test new technologies to enhance shoreside participant situational awareness during dives including SeaTube sensor visualization.
- k. Test remote access to sample data management systems and workflow.
- l. Test new wetlab camera to enable remote sample processing assistance.
- m. As the primary engineering objectives allow, enable participants on shore to engage remotely.

3. Video and Telepresence Engineering

- a. Test terrestrial and high-speed satellite links.
- b. Verify Global Foundation for Ocean Exploration (GFOE)-managed telepresence systems perform as expected.
- c. Test all subsea video equipment on *Deep Discoverer* and *Seirios* and ensure their proper integration into the video system. Ensure proper field of view and angles for all newly installed cameras.
- d. Test all shipboard video equipment (hangar, deck cameras, wire camera, etc.) and ensure their proper integration into the video system.
- e. Document and test potential process for the live streaming of video from the Wet Lab to enable participants onshore to view samples in real time.
- f. Test ability to conduct google hangouts at sea based on new network traffic routing integrated in FY20.
- g. Test new ME20 extremely low light camera.
- h. Test the new 4K camera.
- i. Test new camera controllers.



4. Acoustic Mapping Objectives

- a. Overnight mapping operations may include any testing and development of processes of the EM 304 that was not previously completed during EX-21-01.

5. Data Management

- a. Test remote access to onboard sample data management computer systems.
- b. Verify GFOE-managed data systems perform as expected.
- c. Update Standard Operating Procedures (SOPs) to reflect GFOE-managed network changes.
- d. Install and test the Ocean Networks Canada server, and subsequently test new data visualizations available through SeaTube V3.
- e. Test, troubleshoot, and evaluate new live ship operations ArcOnline map.

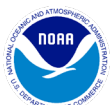
6. Ship Familiarization

- a. Test and continue to build familiarity with *Okeanos Explorer's* new Dynamic Positioning System.
- b. Conduct Aft Conn training.
- c. Conduct small boat operations and training as conditions permit.
- d. Review and test the new ethanol emergency procedures with the science party.
- e. Small boat training and use for potential recovery of underwater vehicles.
- f. Practice & discuss a Man Over Board scenario drill during ROV recovery. Can be conducted in conjunction with the emergency ROV recovery drill.

E. Participating Institutions

See [NOAA Ship *Okeanos Explorer* FY2021 Field Season Instructions](#) for a list of participating institutions that span the entire FY21 field season.

- Navy History and Heritage Command
Washington Navy Yard, Washington D.C.
- Greater Atlantic Regional Fisheries Office
55 Great Republic Drive, Gloucester, MA 01930
- Mid-Atlantic Fishery Management Council
800 North State Street, Suite 201, Dover, DE 19901
- New England Fishery Management Council
50 Water Street, Mill 2, Newburyport, MA 01950



F. Personnel (Mission Party)

Mission personnel (see **Table 1**) will arrive in Norfolk, Virginia between May 28 and June 3, 2021 during the bubble reset to mobilize and load the ROV onto the ship. At the conclusion of the bubble reset, the mission personnel will shelter-in-place (SIP) for seven days from June 4 to June 10, 2021. Mission personnel will join the ship on June 11, 2021, after the SIP periods and two negative COVID-19 tests. Mission personnel will then be on board for the duration of the expedition June 11 - June 27, 2021. Some personnel will depart on June 28, 2021, and others will stay on board for the expedition that follows (EX-21-04). The expedition will also be supported by shoreside personnel (see **Table 2**).

Table 1. Seagoing Mission Personnel. This list is tentative until travel is booked. Any deviations will be communicated to the operations officer.

#	Name (Last, First)	Title	Date Aboard	Date Disembark	Gender	Affiliation	Nationality
1	Cantwell, Kasey	Expedition Coordinator	06/11	07/29*	F	OER	USA
2	Hoy, Shannon	Mapping Lead	06/11	07/29*	F	OER (CNSP) ¹	USA
3	Dornback, Matt	Expedition Coordinator (Training)	06/11	06/28	M	OER (CNSP) ¹	USA
4	Baechler, Neah	Mapping Watch Lead	06/11	06/28	F	UCAR	USA
5	McLetchie, Karl	ROV Lead	06/11	06/28	M	GFOE	USA
6	Aragon, Fernando	Data Manager	06/11	06/28	M	GFOE	USA
7	Wright, Chris	ROV Engineer	06/11	07/29*	M	GFOE	USA
8	Lanning, Jeff	ROV Engineer	06/11	06/28	M	GFOE	USA
9	Mohr, Bobby	ROV Engineer	06/11	06/28	M	GFOE	USA
10	Jenson, Anya	ROV Engineer	06/11	07/29*	F	GFOE	USA
11	Kennison, Sean	ROV Engineer	06/11	07/29*	M	GFOE	USA
12	Lister, Andy	ROV Engineer	06/11	06/28	M	GFOE	USA
13	Murphy, Lars	ROV Engineer	06/11	07/29*	M	GFOE	USA
14	Mefford, Jon	ROV Engineer	06/11	07/29*	M	GFOE	USA
15	Durbin, Mark	Telepresence Engineer	06/11	07/29*	M	GFOE	USA



16	Doros, Brian	Telepresence Engineer	06/11	06/28	M	GFOE	USA
17	Brian, Roland	Video Engineer	06/11	07/29*	M	GFOE	USA
18	Bailey, Caitlin	Videographer	06/11	06/28	F	GFOE	USA

* Continuing stay on *Okeanos Explorer* through next cruise

¹ Cherokee Nation Strategic Programs

Table 2. Shoreside Support Personnel and Key Contacts

#	Name (Last, First)	Title	Affiliation	Nationality
1	Cromwell, Megan	Sample Data Manager	NOAA NCEI	USA

1. Foreign National Guests (FNGs) Access to OMAO Facilities and Platforms

There are no FNGs planned for the EX-21-03 expedition.

G. Administrative

1. Points of Contact

Table 3. Points of Contact

Operations	Name, Title	Office	Address	Phone/Fax	Email
Marine Operations Center, Atlantic	CAPT Nicholas Chrobak, Commanding Officer	Marine Operations Center, Atlantic	439 West York Street Norfolk, VA 23510-1145	(757) 441-6776/ (757) 441-6495	co.moc.atlantic@noaa.gov
Marine Operations Center, Atlantic	LCDR Fiona Matheson, Chief of Operations	Marine Operations Center, Atlantic	439 West York Street Norfolk, VA 23510-1145	(757) 441-6842/ (757) 441-6776	Chiefops.MOA@noaa.gov
NOAA Ship <i>Okeanos Explorer</i> (primary)	CDR Nicole Manning, Commanding Officer	NOAA Ship <i>Okeanos Explorer</i>	NOAA Ship <i>Okeanos Explorer</i> Attn: Name or Department 47 Chandler Street Newport, RI 02841	(401) 439-7848	CO.Explorer@noaa.gov
NOAA Ship <i>Okeanos Explorer</i> (primary)	LT Bryan Pestone, NOAA Operations Officer	NOAA Ship <i>Okeanos Explorer</i>	NOAA Ship <i>Okeanos Explorer</i> Attn: Name or Department 47 Chandler Street Newport, RI	(808) 659-9179 x221	ops.explorer@noaa.gov



			02841		
Mission (primary)	Kasey Cantwell, Expedition Coordinator	NOAA Office of Ocean Exploration and Research	1315 East-West Highway, Silver Spring, MD 20910	(301) 717-7776	kasey.cantwell@noaa.gov
Mission (primary)	Matt Dornback, Expedition Coordinator (training)	NOAA Office of Ocean Exploration and Research	1315 East-West Highway, Silver Spring, MD 20910	(910) 512-3482	matt.dornback@noaa.gov
Mission (primary)	Shannon Hoy, Mapping Lead	NOAA Office of Ocean Exploration and Research	24 Colovos Road Durham, NH 03824	(202) 880-2725	shannon.hoy@noaa.gov
Mission (other)	Kasey Cantwell, Operations Chief	NOAA Office of Ocean Exploration and Research	1315 East-West Highway, Silver Spring, MD 20910	(301) 717-7776	kasey.cantwell@noaa.gov
Mission (other)	Rachel Medley, Chief, Expeditions and Exploration Division	NOAA Office of Ocean Exploration and Research	1315 East-West Highway, Silver Spring, MD 20910	(301) 789-3075	rachel.medley@noaa.gov
Mission (other)	Genene Fisher, Acting Director	NOAA Office of Ocean Exploration and Research	1315 East-West Highway, Silver Spring, MD 20910	(301) 734-1016 Mobile: (202) 631-1790	genene.fisher@noaa.gov

2. Diplomatic Clearances

The priority areas of this project lie within the EEZ of the U.S. and international waters. No diplomatic clearances are needed.

3. Shipments

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

For shipments to arrive while in port in Norfolk, Virginia at the start of the expedition, **shipments should arrive no later than June 12, 2021** and be mailed to the following address:

NOAA Ship Okeanos Explorer
Attn: [Insert name]
Marine Operations Center, Atlantic (MOA)
439 West York Street
Norfolk, VA 23510-1145

For shipments to arrive while in port in Newport, Rhode Island after the expedition from June 28-29, 2021, **shipments should arrive no later than June 29, 2021** and should be mailed to the following address:

Newport Navy Base:
NOAA Ship Okeanos Explorer
Attn: [Insert Name]
47 Chandler Street
Newport, RI 02841

During the port call in Newport, Rhode Island, deliveries will be conducted contact free in compliance with OMAO's COVID protocols to maintain the bubble between cruises.

4. Dietary Restrictions

During EX-21-03 the mission team has:

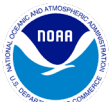
- 3 vegetarians
- 1 individual who cannot eat seafood
- 1 individual on a low sodium diet

5. COVID-19 Contingency Plan for Scientific Party

In accordance with "NOAA OER COVID-19 Field Operations Expectations and Information" (see summary in Appendix E), all mission personnel must have received a negative COVID-19 test prior to travel to the port of call. Any mission personnel who test positive will be disqualified from sailing, and backup personnel will be activated as mission objectives and priorities dictate.

If any mission personnel test positive for COVID-19 during the OMAO-required shelter-in-place periods:

- NOAA Marine Health Services will notify the individuals who test positive that they are not cleared to board the ship. OER will reimburse the individual for 14 days of



shelter-in-place lodging to complete their isolation and for a COVID-19 test to confirm they are negative prior to returning home.

- [Residence Inn, 227 West Brambleton Avenue, Norfolk, Virginia 23510](#)
- The expedition coordinator will be notified of any mission personnel who are not cleared to sail (but they will not be told why).
- The expedition coordinator will notify the OER operations chief.
- The expedition coordinator will determine, in consultation with the ship's Commanding Officer, OER Operations Chief, and appropriate parties, whether the mission will continue without the uncleared individual(s).

If any mission personnel develop COVID-19-like symptoms while underway, [OMAO protocols](#) will be strictly followed. The expedition coordinator or designee will remain the primary point of contact for all mission personnel. Additional support with onshore logistics for impacted mission personnel will be provided by:

LT G. Carl Noblitt IV, NOAA
Operations Deputy, Expeditions and Exploration Division
NOAA Office of Ocean Exploration and Research
SSMC#3
1315 East West Highway
Silver Spring, MD 20910
Cell: 240-507-4437

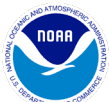
II. Operations

A. Project Itinerary

The project itinerary for EX-21-03 is detailed in **Table 4**. All times and dates are subject to prevailing conditions and the discretion of the Commanding Officer. Locations are approximate. Final ROV dive sites will be delivered to the bridge the night prior for the next day's ROV dive. All dives are planned to be the standard length of eight hours.

Table 4: Cruise Itinerary. This is an approximate itinerary and is subject to change based on objective completion, weather, and logistical needs.

Date	Activities
5/27 - 6/3	Bubble reset. Mission personnel arrive in Norfolk. Staging and alongside work detailed in Table 5 with special attention to providing space for the demobilizing EX-21-02. ROV dunk test is planned for June 2 or 3. May 31 is Memorial Day Holiday.
6/4 - 6/10	Shelter in place. Virtual meetings to go over ship orientation, review policies

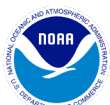


	and procedures while sailing, a virtual lock out tag out training, and to walkthrough ROV procedures.
6/11 - 6/12	Mission personnel move aboard the ship. If not achieved previously, ROV dunk test on June 11. ROV launch and recovery practice on June 11. Staging and alongside work detailed in Table 5. Vessel familiarization meeting (~45 min) with mission personnel that have not sailed with EX within the last year. Pre-project meeting to be held with the ship in combination with daily operations meeting. Emergency recovery practice and walkthrough of USBL calibration on June 12. Welcome aboard briefings and drills.
6/13	Depart Norfolk, Virginia at 0900. Navigate outside of Chesapeake Bay and outside of shipping lanes to a relatively sheltered location and perform a ROV dunk test.
6/14	USBL Calibration (Appendix A). Launch and recovery practice. Conduct safety drills. Overnight mapping
6/15	Dive 1 (8 hrs), overnight mapping.
6/16	Dive 2 (8 hrs), overnight mapping.
6/17	Dive 3 (8 hrs), overnight mapping.
6/18	Dive 4 (8 hrs), overnight mapping.
6/19	Dive 5 (8 hrs), overnight mapping.
6/20	Dive 6 (8 hrs), overnight mapping.
6/21	Dive 7 (8 hrs), overnight mapping.
6/22	Dive 8 (8 hrs), overnight mapping.
6/23	Dive 9 (8 hrs), overnight mapping.
6/24	Dive 10 (8 hrs), overnight mapping.
6/25	Dive 11 (8 hrs), overnight mapping.
6/26	Dive 12 (8 hrs), overnight mapping.
6/27	Transit to Newport, Rhode Island.

B. Staging and Destaging

A large amount of work will be needed to stage the mission equipment before EX-21-03 (**Table 5**). For maximum efficiency of time, this staging will be coordinated with the destaging crew of the previous cruise, EX-21-02, as well as coordinated with the ship's crew. All destaging information for EX-21-02 is included in the EX-21-02 Project Instructions.

Alongside activities planned for EX-21-03 in Norfolk Virginia. A living version of this table is upkept, shared with the ship, and can be found here:



https://docs.google.com/spreadsheets/d/1_zC8Or3HAXPA8LqI4INceOAZRkXTw3a9wYs1NFA9BFA/edit#gid=0

Table 5: Alongside activities planned for EX-21-03 in Norfolk Virginia.

Date	In Port Day #	Side Projects	Mobilization Prep (EX2103)	Ship Operations
27-May	1	Personnel arrive	Personnel arrive	Arrive into Norfolk
				Demob EX-21-02
28-May	2		ROVs + Container arrival 8am	Ship's force needed
		Potential Personnel arrive	ROV + Container load on to EX	Crane and forklift support needed
			Mobilization/ reintegration of D2 and Sierios	Crane support needed
			Winch pull test + 0.68 cable termination	CB needed
29-May	3		Personnel arrive	Potential ship's force needed (depends on schedule)
		OER/ GFOE property inventory	Winch pull test (if not completed 5/28)	CB needed, potential engineering support for winch power
			Ping USBL over the side	Port Permission Needed
		Potential Personnel arrive	mobilization/ reintegration of D2 and Sierios	Crane support needed to move Seirios into place
30-May	4	OER/ GFOE property inventory	Mobilization/ reintegration of D2 and Sierios	
			Potential for ROV High voltage testing	Potential engineering support needed
		Potential EX2104 Science lead training	Ping USBL over the side	Port Permission Needed
31-May	5	OER/ GFOE property inventory	Mobilization/ reintegration of D2 and Sierios	
			ROV High voltage testing	Potential Engineering support needed



1-Jun	6	OER/ GFOE property inventory	Mobilization/ reintegration of D2 and Sierios	Fueling (confirmed)
			No High voltage testing during fueling!	
			VSAT testing, need access to dish and permission to climb	
			Sample data management remote access preparations	
2-Jun	7	OER/ GFOE property inventory	Mobilization/ reintegration of D2 and Sierios	
			Review ethanol procedures	Review ethanol procedures
			High voltage testing/Potential ROV Dunk Test plus buoyancy check	Engineering & Deck Crew support needed
			Sample data management remote access preparations	EX Vaccination Day - TBD Late Afternoon
3-Jun	8		mobilization/ reintegration of D2 and Sierios	
			High voltage testing/ROV Dunk Test plus buoyancy check	Engineering & Deck Crew support needed
			Sample data management remote access preparations	
			Potential to ping sonars	
			Balance of personnel arrive	
4-Jun	9		SIP	SIP
5-Jun	10		SIP	SIP
6-Jun	11		SIP	SIP
7-Jun	12		SIP + COVID Test	SIP + COVID Test
8-Jun	13		SIP + Vessel orientation meeting @ 2 pm	SIP + Vessel orientation meeting @ 2 pm



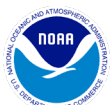
9-Jun	14		SIP + Lock out/Tag out training @ 2 pm	SIP + Lock out/Tag out training @ 2 pm
10-Jun	15		SIP	SIP
11-Jun	16		All sailing personnel move onboard	All sailing personnel move onboard
			Dunk test (back up date)	Deck crew needed
			Practice launch and recovery	Officers & Deck crew needed (officers just at beginning)
			Ping sonars	Cruise prep
12-Jun	17		Pre-cruise preparatons and checklists	load stores
			ROV and emergency procedures walk through and practice	Officers & Deck crew needed (officers just at beginning)
			USBL Cal Walkthrough	Officers & Deck crew needed (officers just at beginning)
				Cruise prep
13-Jun	18		EX departs norfolk	EX departs norfolk

Minimal de-mobilization is expected as EX-21-04 is an ROV cruise in the same COVID-19 operational bubble. Reserving the use of the ship's deck force and cranes in case of unforeseen circumstances is requested.

C. Operations to be Conducted

1. ROV Dives

Table 6: List of planned ROV dive sites for EX-21-03. Note that this is an approximate itinerary and is subject to change based on the needs of engineering objectives, community input, survey results, field conditions, and discretion of the CO. Please note that the position information for each dive is tentative until the dive planning is completed the day before each scheduled ROV dive.



Dive No.	Date	Location	Latitude	Longitude	Depth (m)	Dive focus
1	6/15	Currituck 1	36° 25.3326'N	74° 45.243'W	570	Benthic
2	6/16	Currituck 2	36° 17.4018'N	74° 41.805'W	1000	Benthic
3	6/17	Norfolk Abyssal Plain	36° 20.1942'N	74° 4.7028'W	2500	Benthic
4	6/18	Bermuda Transect 1	36° 32.5962'N	70° 41.7786'W	4380	Benthic
5	6/19	West Caryn Deep	36° 40.116'N	68° 1.443'W	5000	Benthic
6	6/20	Caryn South	36° 38.4336'N	67° 58.608'W	4300	Benthic
7	6/21	Caryn North	36° 41.8626'N	67° 58.2708'W	3400	Benthic
8	6/22	Bermuda Transect 2	37° 53.199'N	70° 8.283'W	3886	Benthic & midwater
9	6/23	Deep Hudson	38° 40.0194'N	71° 2.7408'W	2947	Benthic
10	6/24	Toms Canyon	39° 4.9638'N	72° 36.5226'W	550	Benthic
11	6/25	Hudson Seeps	39° 19.9518'N	72° 4.2156'W	1150	Benthic & midwater
12	6/26	UCH Dive	For official use only	For official use only	425	Benthic

2. CTD Casts

No CTD casts are planned for this cruise, but if a CTD is desired and operationally feasible, it will include a discussion with the Operations Officer and the Senior Survey Tech (SST).

3. Telepresence/Outreach Events

- a. Host an outreach event with the OER education team and the URI Inner Space Center interviewing an ROV expert onboard the *Okeanos Explorer*. The event is tentatively scheduled for June 22, 1700-1800.
- b. Live interaction with the National Ocean Science Bowl winners (date TBD)
- c. Potential VIP live interaction (date TBD)

4. In-Port Events

- a. No in port public events are planned for this cruise.

5. Special/Unusual Operations or Requests



- a. No special operations are planned at this time.

D. SCUBA Dive Plan

All SCUBA 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 SCUBA science dives are planned during EX-21-03, but the ship may plan training, safety drills, or maintenance dives.

E. Applicable Restrictions

A portion of the EX-21-03 mission area on the high seas is subject to the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). For more information on the CITES permit for EX-21-03 refer to Appendix C.

III. Hazardous Materials

For more information about policy, compliance, and spill response, see the [NOAA Ship Okeanos Explorer FY2021 Field Season Instructions](#).

Table 7: Inventory of hazardous materials that will be onboard for EX-21-03

Item	Use	Approx. locations
95% UPS Denatured Ethanol (270 gal.)	Sample preservation	02 Deck, port side ethanol storage container
Formaldehyde (7 gal.) to be buffered into 10% Buffered Formalin	Sample preservation	Wetlab, under the chemical hood
Bleach (3 Gallons)	Sterilization and sample preservation	Wetlab cabinet under sink
Magnesium chloride (1 kg)	Sample preservation	Wetlab under hood
Sodium phosphate (1kg)	Sample preservation	Wetlab under 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 (2 gal.)	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	Winch room
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
Shell Diala S2	Vitrea	Hanger, Vehicles
Por-15	Paint Kit	ROV Workshop Fire cabinet
Aeroshell 41	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
Adhesive Pliobond 25	General adhesive	Tool room
AP 120 Metal Prep	Degreaser/cleaner for metal surfaces	Pit
Butane Fuel	Torch refill	Tool Room
PVC cement	Adhesive for PFV plastic piping	Tool Room
Phosphoric Acid	Ferrous metal rust removal	Tool room
Pipetite Paste	Plumbing sealant	Tool room/pit
Spindle Oil 10, ROS PT	Lubricant/compensation oil	Tool room
DC557	Silicon grease	Tool room/pit
Tether Potting Catalyst	Two part epoxy catalyst	Pit
Tether Potting Compound	Two part epoxy ingredient	Pit
ThermaPlex Bearing Grease	Lubricant	Pit
Tritech Seaking	Compensator oil for sonar head	Pit

IV. Equipment

A detailed list of equipment provided by the ship and OER can be found in the [NOAA Ship Okeanos Explorer FY2021 Field Season Instructions](#). There are no specific changes relative to this expedition.



V. Appendices: (all that apply)

A. Additional Figures, maps, tables, images, elaborate on operations etc.

- Documentation of USBL calibration standard operating procedures can be found here:
https://drive.google.com/file/d/1I5MzV0Tc7Qolhr5I_Ft009fD_quA3Umh/view?usp=sharing

B. Data Management Plan

Okeanos Explorer Mission EX2103 Data Management Plan

Report Date: 2021-05-04

1. General Description of Data to be Managed

1.1 Name and Purpose of the Data Collection Project:

2021 ROV Shakedown

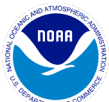
EX2103 is an ROV shakedown cruise focused on the operational readiness of the dual body ROV system, Deep Discoverer and Seirios. The cruise will commence on June 13, 2021 in Norfolk, VA and conclude on June 27, 2021 in Newport, RI.

1.2 Summary Description of the data to be collected:

Operations for this cruise will be conducted 24 hours per day, and consist of Remotely Operated Vehicle (ROV) shakedown operations during the day and mapping operations over night. Limited shore-based operations will be conducted via telepresence operations for data management surrounding all aspects of ROV operation as well as specimen collection trial activity.

1.3 Keywords or phrases that could be used to discover the data:

Bermuda Transect, Caryn Seamount, CTD, Currituck, Deep Hudson, Deep Discoverer, EM304, expedition, exploration, explorer, Hudson Seeps, mapping survey, marine education, Mid-Atlantic, Mid-Atlantic Canyons, multibeam, multibeam backscatter, multibeam sonar, multi-beam sonar, National Ocean Mapping Exploration and Characterization, Newport, noaa, noaa fleet, NOMECS, Norfolk, ocean, ocean discovery, ocean education, ocean exploration, ocean exploration and research, ocean literacy, ocean research, oceans, OER, okeanos, okeanos explorer, R337, Rhode Island, science, scientific computing system, scientific mission, scientific research, SCS, sea, sea acceptance trials,



Seabed 2030, Seirios, single beam sonar, singlebeam sonar, single-beam sonar, site characterization, sonar anomalies, split beam sonar, stewardship, sub-bottom profile, systematic exploration, technology, Tom's Canyon, undersea, underwater, Virginia Beach, water column backscatter

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:

Start Date: 2021-06-13 and End Date: 2021-06-27

1.6 Actual or Planned Geographic Coverage of the data:

Northernmost Boundary: 41.487 and Southernmost Boundary: 36.29

Westernmost Boundary: -76.286 and Easternmost Boundary: -67.977

1.7 What data types will be created or captured and submitted for archive?

Bottom Backscatter, Cruise Plan, Cruise Summary, CTD (processed), CTD (product), CTD (raw), Digital Video, Dive Summary Reports, EK60 Split Beam Data, EK80 Split Beam Data, Launch and Recovery Locations, Multibeam (image), Multibeam (processed), Multibeam (product), Multibeam (raw), Navigational Data, Sampling Summary Reports, SCS Output (compressed), SCS Output (native), Seafloor Imagery, Sound Velocity Profile, Sub-Bottom Profile data, Temperature data, Water Column Backscatter, XBT (raw)

1.8 What platforms will be employed?

NOAA Ship Okeanos Explorer, Deep Discoverer ROV, Seirios Camera Platform

2 Points of Contact for this Data Producing Project

Overall POC: Kasey Cantwell, kasey.cantwell@noaa.gov

Title: Expedition Coordinator

Affiliation: NOAA Office of Ocean Exploration and Research

Phone: (301) 734-1050

3 Points of Contact for Managing the Data

Data POC: Megan Cromwell, Andy O'Brien

Data POC Title: Stewardship Data Management, Onboard and shoreside data management

Data POC Email: megan.cromwell@noaa.gov, andrew.obrien@tgfoe.org

4 Resources

4.1 Have resources for management of these data been identified?

Yes

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 NetCDF3 format to NCEI-MD; AUV seafloor imagery, water column profile data and navigation data will be delivered in ASCII format to NCEI-MD; EM304 and EK60/80 output data and metadata along with water column profiles used for calibration 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 EM304 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

6 Data Documentation

6.1 Does the metadata comply with the Data Documentation Directive?

Yes

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 the NOAA OneStop catalog and an OER Web Accessible Folder (WAF) hosted at NCEI-MS for public discovery and access.

URL: https://data.noaa.gov/waf/NOAA/NESDIS/ncei/oer/iso_u/xml/

Metadata Standard: ISO 19115-2 Geographic Information with Extensions for Imagery and Gridded Data will be the metadata standard employed.

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?

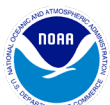
Yes

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.

Organization: NOAA National Centers for Environmental Information (NCEI)

URL: <https://www.ncei.noaa.gov>

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

Hold time: Data are considered immediately publicly accessible as soon as possible after the mission, unless there are documented restrictions.

Hold 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 Data Management Plan at NOAA's EDMC DMP Repository 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.

The EM304 output data is a new format not currently read by NCEI archive systems. The new file format is being added to the system capability. There will be an unknown delay for the archive of these .kml files. All other data will be archived within 60-90 days of receipt.

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.

C. List of Licenses, Permits, and Environmental Compliance

Pursuant to the National Environmental Policy Act (NEPA), NOAA OER is required to include in its planning and decision-making processes appropriate and careful

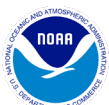


consideration of the potential environmental consequences of actions it proposes to conduct. NOAA's Administrative Order (NAO) 216-6A Companion Manual describes the agency's specific procedures for NEPA compliance. Among these is the need to review all proposed NOAA-supported field projects for their potential environmental impacts. An environmental review analysis has been completed for this expedition in accordance with Section 4 of the Companion Manual. Based on this review we determined that a categorical exclusion is the appropriate level of NEPA analysis for this expedition and that no extraordinary circumstances exist that would require preparation of an environmental assessment or environmental impact statement. This document is on file with OER and can be provided upon request.

See *Okeanos Explorer* FY2021 Field Season Instructions for additional information regarding environmental compliance that applies to the entire field season (e.g. Endangered Species Act Section 7 consultation and potential impacts to Essential Fish Habitat).

A CITES permit for EX-21-03 was requested to cover the collection of Antipatharian and Scleractinian corals while operating in the high seas. This permit is currently pending (June 7, 2021). Applicable species will not be collected without an approved permit. Importation of these specimens will happen in conjunction with EX-21-04 specimens at the conclusion of the COVID bubble for these two expeditions.

NOAA Fisheries Greater Atlantic Regional Fisheries Office, Letter of Acknowledgement





UNITED STATES DEPARTMENT OF COMMERCE
 National Oceanic and Atmospheric Administration
 NATIONAL MARINE FISHERIES SERVICE
 GREATER ATLANTIC REGION
 55 Great Republic Drive
 Gloucester, MA 01930-2276

SCIENTIFIC RESEARCH LETTER OF ACKNOWLEDGMENT

21007

Principal Investigator: Kasey Cantwell
 Operations Chief, Expeditions and Exploration Division
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Amanda Maxon
 NOAA OER
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 Silver Spring, MD 20910
 (301) 734-1249
 amanda.maxon@noaa.gov

Issuance Date: March 10, 2021

Acknowledged Study Period: April 1, 2021 – September 31, 2021

Vessel Owner or Operator	Vessel Name	IMO Number
NOAA	R/V <i>Okeanos Explorer</i>	8835114

This letter acknowledges that the R/V *Okeanos Explorer* is acting as a scientific research vessel, and is exempt from the Atlantic Coastal Fisheries Cooperative Management Act, the Magnuson-Stevens Fishery Conservation and Management Act, and fishery regulations published in 50 CFR parts 648 and 697. The acknowledgement applies while the vessel is participating in research activities described in the Scientific Research Plan, within the specified study period, and while under the control of NOAA. The regulations authorizing these exemptions are described in 50 CFR 600.745.

NOAA is using the *Okeanos Explorer* to conduct an exploration and mapping expedition in the North Atlantic Ocean. The research activity will use remote operated vehicles (ROV) and sonar technology to explore and map the ocean floor.

The expedition consists of 7 cruises and a combined 134 days-at-sea. Mapping and exploration activities will be conducted 24 hours a day. ROVs will be operated during the day, and sonar



SCIENTIFIC RESEARCH LETTER OF ACKNOWLEDGMENT

mapping will be conducted at night. OER staff will be on board all trips conducted under this LOA to direct research activities. No fishing gear will be deployed during the research cruises.

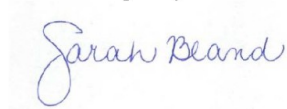
This letter does not acknowledge any other activities conducted outside the scope of the Scientific Research Plan; including those which may not be considered scientific research activities and may require a separate permit. This letter is not intended to inhibit or prevent any scientific research activity conducted by the research vessel. In addition, this letter does not exempt the above vessel from requirements imposed by any state.

This letter is separate and distinct from any permit or consultation required under the Marine Mammal Protection Act, the Endangered Species Act, or any other applicable law. To determine if such a permit is required, please contact the Greater Atlantic Region's Protected Resources Division at (978) 281-9174. All necessary permits should be obtained prior to embarking on any research activity.

Please submit a copy of any cruise report or other publication created as a result of the project, including the amount, composition, and disposition of the catch, be submitted to: Ryan Silva, at ryan.silva@noaa.gov.

Please carry copies of the Scientific Research Plan and the Letter of Acknowledgment (LOA) on board the vessel while conducting this research. If the vessel is subject to vessel monitoring system reporting requirements, the vessel will need to declare out of fishery (DOF-SCI) while operating as the research platform. In addition, it is recommended that any fish or fish parts retained for research be accompanied by a copy of this LOA.

Acknowledged by:



Sarah Bland
Assistant Regional Administrator
for Sustainable Fisheries



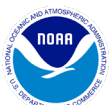
D. Emergency Contact Data Sheet

EMERGENCY CONTACT DATA SHEET–NOAA SHIP *OKEANOS EXPLORER*

Scientists sailing aboard *Okeanos Explorer* shall fill out the form found at the following link with their emergency contact information:

https://docs.google.com/forms/d/e/1FAIpOLScDZ_OM5si6JCguPtTS42ftHgrspYfFcD6NpmEosHtLR1qtUw/viewform?gxids=7628

E. OER COVID-19 Guidelines and Expectations





OER COVID-19 Guidance Summary for Mission Personnel

Required Reading

Mission personnel must familiarize themselves with all the protocols in the required documents prior to traveling. More information beyond the required reading can be found [here](#).

[OMAO COVID-19 Guidance](#) (Phase VI)

[NOAA COVID-19 Safety Orientation Course](#)

[NOAA Ship Okeanos Explorer Standing Orders](#)

[OMAO COVID-19 Shipboard Safety Briefing for Marine Operations](#)

[NOAA OER COVID-19 Field Operations Guidelines and Expectations](#)

[Ship Screening & Advanced Safety Measures](#)

Summary of Guidance and Expectations

This summarizes what is required from mission personnel participating in NOAA Office of Ocean Exploration and Research (OER) field operations. For more detailed information, see the required documents above.

- At least 30 days before travel, mission personnel must take the [NOAA COVID-19 Safety Orientation Course](#), review the Office of Marine and Aviation Operations (OMAO) [COVID-19 Shipboard Safety Briefing for Marine Operations](#), and complete the OER [Sailing Contact Form](#) to provide a shipping address for the COVID-19 test kit(s) (as one is required) and KN95 mask(s) (if requested).
- Prior to travel, OER recommends that mission personnel **shelter in place for seven days**. Four days before traveling to the port, mission personnel must test themselves using an **OER-supplied COVID-19 test kit**. OER requires that mission personnel receive a negative COVID-19 test prior to travel. For instructions regarding how to request, administer, and send the self-administered COVID-19 tests, refer to the [OER COVID-19 Testing Fact Sheet](#).
- Mission personnel must follow the [Centers for Disease Control and Prevention's COVID-19 best practices](#), including using risk avoidance measures while traveling. Mission personnel are required to wear a two-layer cloth or KN95 mask during the entirety of travel. OER will provide mission personnel with a KN95 mask upon request. Individuals are also encouraged to consider current CDC recommendations to wear more than one mask for added protection.
- After mission personnel complete their travel and before they join the ship for a cruise, they must **shelter in place for seven days near the ship's port of call** to enable daily medical screenings. While sheltering in place, mission personnel must take **two (95% accuracy) COVID-19 tests provided by OMAO**. Mission personnel may join the ship once they have sheltered in place for seven days and receive two negative (95% accuracy) COVID-19 tests.
- All personnel must complete daily COVID-19 screenings using the [NOAA COVID-19 Screening Tool](#). The particular logistics of this screening will be coordinated by the Expedition Coordinator, OPS, and OOD as how an individual completes the screening will depend on if the ship is alongside, at sea or if the individual is in a shelter in place phase.
- If an individual has participated in any high risk activities in the last 7 days, they will be required to wear a N95 mask (provided by the ship) for the first 5 days aboard the ship. This may not apply to you if you have completed a shelter in place prior to joining the ship.
- While on the ship, mission personnel must follow the OMAO guidelines and the [CO's standing orders](#).
- At the conclusion of post-cruise/post-project travel, OER will provide mission personnel with a COVID-19 test kit upon request.

Last Updated: 03/24/2021 (Cantwell)



F. OER Ethanol Testing

To ensure the quality of the ethanol stored aboard the *Okeanos Explorer* a testing guide has been developed. This guide provides step by step instructions on how to test the ethanol stored in the ejectable ethanol storage barrel on the 02 deck. This guide also provides a built in calculator to plug in the measurements and get a definitive result. Finally this guide is a log of the current and previous results of the ethanol testing.

<https://docs.google.com/spreadsheets/d/1J69f1mNYjZviFTfaAdQs7U4Wu5fHkQo2ZuGa7tZ5d-s/edit?usp=sharing>

G. Underwater Cultural Heritage Procedures

NOAA Office of Ocean Exploration and Research(OER) Operational Policy and Procedures for Underwater Cultural Heritage Missions Conducted onboard the NOAA Ship *Okeanos Explorer*

A. Purpose

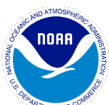
The purpose of this document is to provide guidance for OER mission activities conducted aboard the NOAA Ship Okeanos Explorer, when such mission activities involve either unexpected discovery or targeted exploration of potential Underwater Cultural Heritage sites.

II. Background

Since the inception of NOAA's ocean exploration program in 2000, OER data management practices have been guided by the 2000 President's Panel Report recommendations, which prioritized rapid and unrestricted data sharing as one of five critical exploration program components. More recently Public law 111-11 [Section XII Subtitle A Part 1 Exploration] reinforced and expanded OER data management objectives, continuing to stress the importance of sharing unique exploration data and information to improve public understanding of the oceans, and for research and management purposes.

OER missions conducted aboard the NOAA Ship Okeanos Explorer offer a 'best-case' scenario for meeting Program mission objectives related to data sharing:

- Dedicated shipboard and shore-side teams work in tandem to ensure near-real time data product generation from shipboard and ROV sensors;
- Telepresence is used to share data products and information in real-time with shore-side participants and the public;



- Mission information is publicly communicated in real time via Internet access to streamed video and related resources; and
- Data are managed throughout the lifecycle in accordance with all applicable policy directives and community best practices.

The nature of exploration defines the possibility of discovery, including unexpectedly exposing the location of underwater cultural resources; on some occasions, exploration targets are specifically focused on the exploration of suspected underwater cultural heritage (UCH) sites.

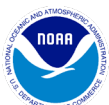
The need to protect the location of suspected UCH sites until they are fully understood, whether purposefully explored or fortuitously discovered, is an important statutory responsibility. In the case of OER expeditions aboard the Okeanos Explorer, a range of operational procedures must be modified to ensure this protection occurs to the fullest extent possible. The following sections of this document define the methods for ensuring protection of these sensitive data throughout the data lifecycle.

III. Authority

- Marine Archaeology:** This document is informed by: the Federal archaeology program; U.S. legislation on the treatment of cultural remains; and the UNESCO Convention for the Protection of the Underwater Cultural Heritage.

The NOAA Office of Ocean Exploration and Research (OER) supports the standards for conducting marine archaeological activities enumerated in the Annex Rules of the UNESCO Convention on the Protection of the Underwater Cultural Heritage. Preservation and protection of prehistoric and historic cultural resources is the policy of the Federal government and OER has a responsibility to consider the effects of its activities on these resources. If data is found to be sensitive because it reveals the location of a historically significant cultural resource, Section 304 of the National Historic Preservation Act provides that the head of a Federal agency or other public official shall withhold from public disclosure information about the location, character, or ownership of a historic property when disclosure may: cause a significant invasion of privacy; risk harm to the historic property; or impede the use of a traditional religious site by practitioners. This document will use the term Underwater Cultural Heritage, or UCH, to refer to historic and prehistoric traces of human existence that are totally or partially underwater.

- Data Management:** Geospatial data are considered a national capital asset. National policy and international standards guide data management best practices to ensure timely and broad public accessibility to these data. Within NOAA, data management practices are informed by NOAA Administrative Order (NAO) 212-15 Management of Environmental Data and Information, which states in part:



Environmental data will be visible, accessible and independently understandable to users, except where limited by law, regulation, policy (such as those applicable to personally identifiable information or protected critical infrastructure information or proprietary trade information) or by security requirements.

Sensitive UCH data collections require special handling while determinations are made as to whether each location will be nominated and will qualify for protection under the NHPA Section 304. OER considers these data to fall within the scope of the NAO 212-15 exceptions during this period.

IV. Roles and Responsibilities

Particular to the NOAA Ship *Okeanos Explorer*, there are many methods employed to ensure rapid and broad data access. When the goal is to restrict access to precise positional information, several operational scenarios must be considered. Alternate operating procedures are then developed for:

- Real time operations:
 - Routine data transmissions and events that broadcast the ship position
 - Seafloor mapping operations and data production
 - Telepresence-enabled ROV operations
 - Video annotations and production
 - Public broadcast operations via website and maps
- Post-cruise data management

This table summarizes the roles and responsibilities of each Team Lead in implementing the policy through the management approaches described herein and the SOPs as defined in the Appendices.

MISSION PERSONNEL (Coordinated by: Expedition Coordinator)	
Responsible Team	Accountable for these (primary) actions
Expedition Coordinator	Notification of NDA to Mission Personnel ID, communicate and enforce UCH buffer zone Coordinate with Team leads and key personnel / ensure SOP compliance
Seafloor Mapping Team	Segregate raw and processed data into marked files so that restricted data are held separately and are clearly marked
Telepresence Team	Ensure broadcast data is free of any positional information
Video Team	Ensure UCH Dives and dive products are annotated as such; ensure all raw data and products are not geo-referenced
Data Management Team	Ensure all UCH data are appropriately segregated and documented.



	Follow post cruise and archive procedures as specified.
Communications Team	Ensure all communications are controlled through one primary POC; ensure communications are not geo-referenced.
<i>Okeanos Explorer Operations</i> (Coordinated by: CO or Designee)	
OMAO Operations	Notification to crew of NDA responsibilities Stop SCS events (email notifications) upon entering buffer zone; Start SCS events (email notifications) upon exiting buffer zone

V. Standard Operating Procedures

Appendix A: MAPPING OPERATIONS

The following outlines the process for pre-cruise planning, mapping field operations, post-cruise follow up, and data archival procedures for the following scenarios:

- When UCH is unexpectedly discovered on a standard, non-UCH targeted mapping cruise
- When a cruise is specifically targeted at UCH.
- When an Isolated UCH survey is conducted as part of a broader cruise
- Large survey over UCH area with potential to contain multiple instances of UCH

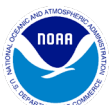
A. Pre-Cruise Planning

1. Standard Mapping Pre-Cruise Planning

- a. This section does not affect normal pre-cruise or data management processes for standard mapping cruises that are not conducting targeted UCH mapping. During pre-cruise planning the EX Cruise Coordinator is advised to consult with the OER Marine Archaeologist to discuss possible UCH targets in the mission area. The mapping team may be requested to optimize line planning as necessary to detect UCH and to process data, when possible, to a smaller non-standard grid size to create higher resolution mapping products to provide better images of potential UCH. If so, follow the guidance in the UCH Mapping Pre-Cruise Planning section below.

2. UCH Mapping Pre-Cruise Planning

- a. Background information - The EX mapping team should be supplied with information about targets in the survey area that will help in their detection and identification. This information will be supplied by OER's marine archaeologist and collaborating archaeologists.

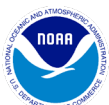


- b.** Data processing and data products - Archaeologists involved with the survey will consult with the mapping team to discuss data processing and data products that will increase the potential to discover UCH. The cruise coordinator and mapping team lead will work with OER's marine archaeologist to coordinate this activity.
- c.** Consultation and data sensitivities - Cruise planning must also include a discussion on data sensitivity and data management/archiving. It is the appropriate time to collaborate with other Federal and state agencies that may have a legal or management interest in potential UCH in the survey area. The risks to the resources should be weighed to inform a post-cruise decision on whether or not UCH with potential historical or cultural significance should have information about their location restricted from public release. This should be a collaborative discussion that includes OER's marine archaeologist, cruise coordinator and cruise data manager along with cultural resource managers and archaeologists from other agencies with an interest in the UCH. Agencies that may have an interest include the Office of National Marine Sanctuaries (ONMS) Maritime Heritage Program, Bureau of Ocean Energy Management, Bureau of Safety and Environmental Enforcement, U.S. Navy History and Heritage Command, National Park Service, State Historic Preservation Officers, and others. While planning expeditions in any foreign country the host government should be made aware of the potential to discover UCH.
- d.** In survey areas where an agency has responsibility for UCH, the data management team should carry out a consultation process with the agency to identify any special protocols that should be put in place to conform with the policies of the agency and these should be incorporated into the data management plan. The expedition coordinator is responsible for the overall execution of the data management plan.
- e.** On mapping missions within the National Marine Sanctuary System, pre-cruise discussions between the EX Cruise Coordinator and ONMS should include the ONMS Director of the Maritime Heritage Program (MHP) and the maritime heritage coordinator at the sanctuary site. They will help determine the sensitivity of data and data products.

B. Mapping Field Operations

1. Standard Mapping Field Operations

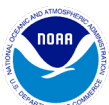
- a.** While standard mapping field operations are not affected by the marine archaeology SOP, any features which appear to be of cultural or historical significance, and appear anthropogenic in origin, do require special consideration. Cultural features include wrecks of ships or aircraft, the recognizable debris from wrecks, evidence of previous human settlements, or other items which may appear anthropogenic in origin and have some associated cultural or historical significance.
- b.** The EX Cruise Coordinator will consult with OER's marine archaeologist immediately on the discovery of UCH in the field. The Cruise Coordinator should provide an image and location information by email. The OER marine archaeologist may request special data products that have higher resolutions than standard data products to aid in characterizing UCH.



- c.** If UCH is determined not to be historically or culturally significant or it is determined that no harm will result by disclosing position information, no change to standard mapping field procedures is required.
- d.** If UCH is historically significant or a potential to be historically significant, data and data products should be held from public release until reviewed for sensitivity as applicable under the National Historic Preservation Act and other pertinent legislation and regulations, prior to releasing data to a public archive.
- e.** The expedition coordinator is responsible for the overall execution of the data management plan.
- f.** When appropriate, OER's marine archaeologist will contact relevant entities to notify them of the discovery and consult with them regarding the significance of the UCH.

2. UCH Targeted Mapping Field Operations

- a.** No informal information about UCH should be released to the general public by the ship or personnel. This includes posting information and images on social networking sites like Facebook, Twitter or personal blogs. Mapping data will be released to the public following the normal process and announcement of discoveries will be made through the appropriate offices and public affairs officials.
- b.** A five-mile buffer zone shall be created around the UCH isolated surveybox. The following steps will be taken just prior to entering the buffer zone in order to stop broadcasting the ship's location while the survey is conducted:
 - i.** NOAA Shiptracker: Disable the SCS feed from the ship going to Shiptracker
 - ii.** Automated Information System (AIS): NOAA requires that the AIS feed which broadcasts information about the ship, including position, course and speed, must remain on at all times for collision avoidance and other safety reasons. Although the [International Maritime Organization's](#) (IMO) Maritime Safety Committee condemns the Internet publication of AIS data, it is easily available for viewing. During the cruise planning phase the Expedition Coordinator will provide the AIS broadcast range on the EX to the chief scientist and science team. The Chief scientist, the science team, or other parties involved in a UCH mapping cruise should be made aware of this and decide whether the value of the operation merits acceptance of the potential issues/outcomes imposed.
 - iii.** Telepresence Video Feeds: Do not stream any feeds that include a visible ship location, for example the multi-beam acquisition screen does not high enough resolution over the video feed to see ship position. Streams include but not limited to the SCS data screen, or any active mapping data acquisition screens, or video feeds. It is acceptable to stream video feeds that do not include the ship's location.

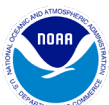


- iv. The Cruise Coordinator will ensure the survey department takes steps to distinguish and separate UCH mapping data from non-UCH mapping data as appropriate.
 - v. Raw Multibeam Data Acquisition: Raw data will be logged in the standard folder structure on the multibeam acquisition computer. Raw data will be copied into a “Restricted” folder in the RAW data network folder structure. Data acquisition and processing logs will clearly state which files are restricted.
 - vi. Multibeam Data Field Processing: Restricted files will be processed and gridded separately from other non-restricted data and will be clearly labeled as such in projects and filenames. The products will be created according to normal field quality-control procedures, but will not be sent to shore with the daily products, in order to not become publicly available via normal channels (FTP / Digital Atlas).
 - vii. Raw EK 60 and Subbottom Data Acquisition: Raw data will be logged in the standard folder structure on the acquisition computers. Raw data will be copied into a 'Restricted' folder on the RAW and CRUISE DATA data network folder structure. Data acquisition and processing logs will clearly state which files are restricted.
 - viii. Cruise Data Transfer (EX to UNH) Package: In the Cruise Data Package carried from the ship by the Mapping Team Lead, a "Restricted" top-level directory will be added in the cruise data folder. Within the "Restricted" folder the same directory structure as the unrestricted folder will be repeated (i.e. SCS, CTD, Multibeam, Imagery, etc).
 - ix. CTD and XBT operations conducted within the buffer zone do not need to be isolated from non-UCH data, or repressed from the *Okeanos* Atlas. CTD and XBT files should follow the normal unrestricted processing procedures and archiving.
 - x. Daily updates are normally linked to the location of the ship at the time the update is posted. If daily updates are made during UCH surveys, no position shall be provided. If a position is required, the position should be posted as it makes sense, 5 miles outside of the extent of the survey area.
- c. Normal transmissions from the ship shall resume after the EX finishes UCH survey operations and exits the 5-mile buffer zone. Exiting the buffer zone should occur at approximately the same location as entry to prevent obvious data location gaps pointing to UCH location.

C. Post-Cruise Follow Up

1. Information Release

- a. No informal information about UCH should be released to the general public by the ship or personnel. This includes posting information and images on social networking sites like Facebook or personal blogs. Mapping data will be released to the public following the normal process and announcement of



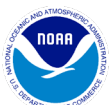
discoveries will be made through the appropriate offices and public affairs officials.

2. Standard Mapping Cruise follow-up where UCH is discovered

- a.** The mapping team will provide a brief summary of the survey and target that includes a description of the survey, water depth, site location, site dimensions, bottom type, and images of the target at the best available resolution.
- b.** The EX Cruise Coordinator and the OER Marine Archaeologist have an initial consultation to discuss the nature of the UCH and its potential significance. This consultation may include other agencies or entities.
- c.** If UCH is determined not to be historically significant no change to standard data management procedures is required.
- d.** If UCH has the potential for historical significance but it is determined that no harm will result by disclosing position information, such as UCH in deep water, no change to standard data management procedures is required.
- e.** If UCH has potential historical significance and disclosing information about the site poses a threat, further discussions will be held on how to minimize potential harmful impacts, including data management decisions outlined in the Data Archiving section of this document. The EX cruise Coordinator, a representative from the data management team, OER's marine archaeologist, a representative from the ONMS Maritime Heritage Program, and any parties with jurisdiction, management or other legal ties to the resource shall meet to determine what measures are needed to protect the UCH while minimizing impacts on the distribution of data and data products.

3. UCH Targeted Mapping Cruise Follow-Up

- a.** The mapping team will create a survey report that provides technical details on the survey, data processing and data products. It should contain a list of targets that includes site location, water depth, site dimensions, bottom type/topography, and images of the target at the best available resolution. Other helpful products include SD and kmz files.
- b.** The EX cruise coordinator, OER's marine archaeologist, a representative from the ONMS Maritime Heritage Program, archaeologists involved in the survey, and any parties with jurisdiction, management or other legal ties to the resource shall meet to discuss the potential historical significance of the UCH and the sensitivities of releasing data to the public that can be protected under Section 304 of the National Historic Preservation Act.
- c.** The outcome of this meeting will determine if it is necessary to protect site location information from public release.
- d.** When data can be released
 - i.** If the findings determine that releasing information and data on UCH is not a threat, development of products and data management should



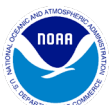
follow the guidelines for a standard mapping cruise.

- e.** When data should be protected
 - i.** If it is determined that a site is or has potential to be historically significant and eligible for nomination to the National Register of Historic Places, the location and data containing the location should not be released to the public.
 - ii.** Data products that contain position information will be forwarded to the EX data management team where data and products will be stored in an archive with restricted access.
 - iii.** Cruise plans, cruise reports, situation reports, mapping summary reports and other documents that are publicly available outside NOAA or freely accessible within NOAA shall not provide location information for UCH or survey areas. In certain circumstances the lead archaeologist for the cruise may request that certain UCH sites are not mentioned in the public reports.

4. UCH mapping follow-up for National Marine Sanctuaries

- a.** When the EX conducts UCH work inside a National Marine Sanctuary the EX Cruise Coordinator shall inform the OER Marine Archaeologist, ONMS Maritime Heritage Program Director, Sanctuary Superintendent and Sanctuary Maritime Heritage Coordinator on the availability of data products and initial results of the survey. ONMS shall determine the sensitivity of the data and whether or not it can be disclosed to the public. Published metadata shall indicate the point of contact to access UCH data within the NMS system is the Director of the Office of National Marine Sanctuaries.

D. Data Archiving – See Appendix C



Appendix B: TELEPRESENCE-ENABLED ROV OPERATIONS

The following outlines the process for pre-cruise planning, field operations, post-cruise follow up, and data archival procedures for the following scenarios:

- When a cruise conducts ROV operations specifically targeted at UCH.
- When UCH is unexpectedly discovered on non-archaeological operation

A. *Unexpected UCH Discovery*

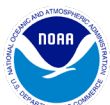
- During the Cruise: If UCH is unexpectedly discovered during an ROV dive, the onboard Expedition Coordinator should immediately contact OER's Lead Maritime Archaeologist, and the Archaeology Doctors-on-Call identified for that expedition. Those archaeologists should be engaged in the site investigation as soon as possible to provide information to help assess the site discovered. No changes to the data, video or onboard data acquisition processes should be made. A post-dive and post-cruise discussion will be held with the OER archaeologist to determine whether any datasets should be withheld from the archive. (Section 2.D.II).
- **Follow-up when UCH is unexpectedly discovered**
 - a. The EX Cruise Coordinator and the OER Marine Archaeologist will have an initial consultation to discuss the nature of the UCH and its potential significance. This consultation may include other agencies or entities.
 - b. If UCH is determined not to be historically significant no change to standard data management procedures is required.
 - c. If UCH has the potential for historical significance but it is determined that no harm will result by disclosing position information, such as UCH in deep water, no change to standard data management procedures is required.
 - d. If UCH is or has potential historical significance and disclosing location information about the site poses a threat, further discussions will be held on how to minimize potential harmful impacts, including data management decisions outlined in the Data Archiving section of this document. The EX cruise Coordinator, a representative from the data management team, OER's marine archaeologist, a representative from the ONMS Maritime Heritage Program, and any parties with jurisdiction, management or other legal ties to the resource shall meet to determine what measures are needed to protect the UCH while minimizing impacts on the distribution of data and data products.

B. *Cruises conducted with ROV operations specifically targeted at UCH.*

1. Pre-Cruise Planning: ROV Exploration

a. **Notifying the Team of their Responsibility to Protect Sensitive UCH Resources**

Expedition members and OER personnel to have a legal responsibility to protect sensitive archaeological information (primarily location information) from untimely release.



For a planned UCH cruise, the EC shall notify the CO and each shall have responsibility for ensuring personnel are aware of this responsibility. The EC shall provide an archaeology background document to familiarize personnel with the particular mission and requirements.

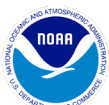
Appendix D details the range of existing accountability mechanisms already in place.

2. Pre-dive planning

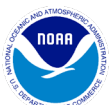
- a.** Archaeologists will develop a dive plan based on the best available knowledge of the site that will maximize data recovery and minimize any potential impact to the site. The archaeology team will work closely with the cruise coordinator and deep submergence vehicle manager to develop and implement the plan. The plan should include:
 - I.** Objectives (cultural/interdisciplinary science)
 - II.** The types of sensors needed and data to be generated
- b.** As a rule ROV dives will not disturb or touch the shipwreck or cultural feature. Exceptions to this rule must discuss the rationale behind such a decision and incorporate it into the dive plan (collection of diagnostic artifacts or samples is sometimes conducted if the activity leads to better baseline characterization).
- c.** Prior to the cruise any permitting requirements should be identified and if required, permits must be procured.
- d.** Automated Information System (AIS): NOAA requires that the AIS feed which broadcasts information about the ship, including position, course and speed, must remain on at all times for collision avoidance and other safety reasons. Although the [International Maritime Organization](#)'s (IMO) Maritime Safety Committee condemns the Internet publication of AIS data, it is easily available for viewing. During the cruise planning phase the Expedition Coordinator will provide the AIS broadcast range on the EX to the chief scientist and science team. The science team, chief scientist, or other parties involved in a UCH mapping cruise should be made aware of this and decide whether the value of the operation merits acceptance of the potential issues/outcomes imposed. A Go/No-Go decision will be made based on this information.

C. Field Operations

- 1.** Exploration dives by ROV should be planned to collect optical and acoustic images without causing physical disturbance to the UCH. Representatives and leads from operational groups including the ROV, data/video, and telepresence teams, and ship operations should meet to discuss ROV operations and data collection.
 - a.** The guidelines for mapping operations should be followed to ensure site locations are not disclosed during field operations. SOPs with full operational details are available on the ship.
 - b.** A three-mile buffer zone shall be created around the UCH target or isolated survey box. The time at which the ship enters, and departs the three-mile buffer



- zone needs to be recorded and provided to the Data Team Lead for post-processing use. Following work at the site, the ship will return to the site where it first entered the three-mile buffer zone to continue operations.
- c.** The following steps will be taken just prior to entering the five-mile buffer zone in order to stop broadcasting the ship's location while the survey is conducted:
- I.** NOAA email events will be stopped (OMAO/ET)
 - NOAA Shiptracker: Disable/stop the e-mail updates from the ship going to OMAO / Shiptracker
 - *Okeanos Atlas*: Disable/stop the e-mail updates to NCDDC
 - SAMOS: Disable/stop the e-mail update to FSU containing METOC and flow-through data, etc.
 - II.** Telepresence Video Feeds (OER Telepresence team lead): Do not stream any feeds that include the ship's location, including but not limited to the SCS data screen, or any active mapping data acquisition screens, or video feeds. It is acceptable to stream video feeds that do not include the ship's location.
 - III.** Redirect Live Feed as needed (OER EC or CO): If highly sensitive features (human remains, evidence of human remain such as shoes or other accoutrements, highly valuable items, etc.) are going to be investigated or are unexpectedly encountered during the course of our seafloor investigation, the lead archaeologist, ROV Team Leader, Expedition Coordinator or Commanding Officer has authority to immediately switch the live feed from the ROV and Seirios camera sled to another camera on the ship.
- d.** Daily updates on the *Okeanos Atlas* are normally linked to the location of the ship at the time the update is posted. If daily updates are made during UCH surveys, no position shall be provided. If a position is required, the position should be posted as it makes sense, 3 miles outside of the extent of the site or survey area.
- e.** Normal transmissions from the ship shall resume after the EX finishes UCH survey operations and exits the 3-mile buffer zone. The point of exit should be as near to the point of entry as is feasible to minimize location data gaps pointing to the location of the UCH.
- f.** No informal information about UCH should be released to the general public by the ship or personnel. This includes posting information and images on social networking sites like Facebook, Twitter or personal blogs. Images, video and information on UCH will be released to the public following the normal process and announcement of discoveries will be made through the appropriate offices and public affairs officials.
- g.** In addition to the items listed, the ship sends out automated weather (autoIMET) observations every hour and manual weather observations every 6 hours with positions as a voluntary ship observer. These observations are pulled onto public sites by several different websites and Google Map apps. One example is sailwx.info. This is only accurate to the nearest decimal degree (6 nm). This level



of accuracy is not of concern.

D. Post-Cruise Data Management – Appendix C for detail

Following completion of the expedition, the Expedition Coordinator should have a follow-up call with the Data Management Team & OER lead archaeologist to review the datasets collected, confirm those that need to be withheld from public archive, and provide information to the data management team for associated metadata records.

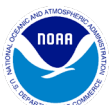
E. Post-Cruise Follow-Up

1. Information Release

- a.** No informal information about UCH should be released to the general public by the ship or personnel. This includes posting information and images on social networking sites like Facebook or personal blogs. Images, video, and mapping data will be released to the public following the normal process and announcement of discoveries will be made through the appropriate offices and public affairs officials.
- b.** Determination of whether UCH is potentially eligible for nomination to the National Register of Historic Places, or eligible for protection under other legislation such as the Sunken Military Craft Act or National Marine Sanctuary Act, will take some time following completion of the cruise. Sensitive or potentially sensitive information about the UCH is to remain restricted until determination is complete. Following completion of the cruise, the lead Archaeologist will work with others to analyze the UCH data and conduct historical research to determine whether the UCH is eligible for nomination to the National Register of Historic Places.
 - I.** If the UCH is determined to be eligible, the lead Archaeologist will prepare the nomination for the NRHP process.
 - II.** If the UCH is determined to NOT be eligible, and protection of the site does not fall under other legislation, the Lead archaeologist will notify the data management team that site information can be made publicly available.

2. UCH Targeted Cruise Follow-Up

- a.** The EX cruise coordinator, OER's marine archaeologist, a representative from the ONMS Maritime Heritage Program, archaeologists involved in the survey, and any parties with jurisdiction, management or other legal ties to the resource shall meet to discuss the potential historical significance of the UCH and the sensitivities of releasing data to the public that can be protected under Section 304 of the National Historic Preservation Act. The outcome of this meeting will determine if it is necessary to protect site location information from public release.
 - I.** When location data can be released:
 - a.** If the findings determine that releasing information and data on UCH is not a threat, development of products and data management should



follow the guidelines for a standard ROV cruise.

- II.** When location data should be protected:
 - a.** If it is determined that a site is or has potential to be historically significant and eligible for nomination to the National Register of Historic Places, the location and data containing the location should not be released to the public.
- III.** Data products that contain position information will be forwarded to the EX data management team where data and products will be stored in an archive with restricted access.
- IV.** Cruise plans, cruise reports, situation reports, mapping summary reports and other documents that are publicly available outside NOAA or freely accessible within NOAA shall not provide location information for UCH or survey areas. In certain circumstances the lead archaeologist for the cruise may request that certain UCH sites are not mentioned in the public reports.

Appendix C: Post-Cruise Data Management

Data collected by OER that is considered sensitive will be protected from direct public release until such time as a final determination can be made as to permanent protection.

Data in this state will be:

- Fully documented, so as to be independently understandable to users;
- Visible through publication of metadata records by OER;
- Accessible upon request to OER (controlled access by permission);
- Preserved in NOAA archives as 'restricted' (not available for direct public access).

These data will not be available for direct public access unless and until they are eliminated from consideration for nomination to the National Register of Historic Places (NHPA Section 304), or for protection under other legislation such as the Sunken Military Craft Act or National Marine Sanctuary Act.

If data are nominated and accepted for any official protection, then the exceptional status will be made permanent, and all documentation updated and finalized as such.

Data generated by the *Okeanos Explorer* is archived under a data management agreement with NCEI. Only data that has potential to reveal the nature and location of UCH shall be restricted from public access. In accordance with the data management agreement, sensitive data from the EX will have restricted access at NCEI. To assist researchers in discovering sensitive data NGDC will publish a metadata record (but not the data) that identifies a point of contact for access. Requests to access the data will be made to the Director of OER who may delegate to the OER marine archaeologist. In lieu of the OER marine archaeologist, the OER Director may delegate to the Director of the ONMS Maritime Heritage Program.

If data is found to be sensitive because it reveals the location of a historically significant cultural resource, Section 304 of the National Historic Preservation Act provides that the head of a Federal agency or other public official shall withhold from public disclosure information about the location, character, or ownership of a historic property when disclosure may cause a significant invasion of privacy; risk harm to the historic property; or impede the use of a traditional religious site by



practitioners. Data collected by the EX that is considered sensitive will be archived in a location where it can be withheld from public disclosure.

Data sets and associated products are housed in the appropriate NOAA archive; National Oceanographic Data Center, National Geophysical Data Center, National Coastal Data Development Center, National Climate Data Center, and the NOAA Central Library.

- Digital Atlas: NCEI will develop appropriate metadata records to post on the digital atlas.
- CTD and XBT data collected during mapping operations conducted within the buffer zone will not be repressed from the *Okeanos Atlas* and will be held in a public archive.
- Cruise reports, cruise plans, mapping summary reports and other documents that are publicly available outside NOAA or freely accessible within NOAA should not provide location information for UCH or survey areas.

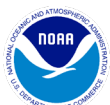
Start and end times for the 3-mile buffer zone surrounding a UCH site need to be provided to the data management team. Datasets containing sensitive location information will be restricted in their entirety, unless other parsing arrangements have been made. The following datasets may contain sensitive UCH location information and need to be reviewed, post-processed as appropriate, made restricted and pertinent metadata records created and made available.

- Multibeam, sub-bottom and single beam sonar data
- SCS Data Logs are to be restricted
- All ROV dive products (including associated sensor data) need to be restricted
- CTD rosette and *in situ* sensor datasets collected in relation to the UCH, and within the 3 nm buffer zone, need to be restricted.
- All imagery needs to be reviewed and geospatial imagery removed before being made public. Imagery with geospatial information should be restricted.
- Ship track and other datasets within the buffer zone

Appendix D: NDA References

Expedition members and OER personnel to have a legal responsibility to protect sensitive archaeological information (primarily location information) from untimely release. The following summarizes the types of personnel who might be engaged in an *Okeanos Explorer* Expedition, where their responsibility to protect sensitive location information about UCH lies, and whether this responsibility has already been addressed or signature of a Non-Disclosure Agreement (NDA) is required to allow their participation in an expedition with planned UCH operations.

- If they are federally-employed scientists, they agreed not to disclose sensitive information and to adhere to federal laws as part of the terms of their employment with the federal government.
- The crew onboard the ship are under the CO's purview. On *Okeanos Explorer*, all crew are federal employees, and thus agreed not to disclose sensitive information and to adhere to federal laws as part of the terms of their employment with the federal government.
- All other members of the Mission team who are not federal employees and are engaged at-sea or ashore (including technicians, vehicle operators, students, etc.) are required to sign a non-disclosure agreement to protect sensitive cultural heritage information as part of their contract agreement.
- Other OER personnel who have access to data and information on the FTP site are either federal employees or contractors and need to be similarly reminded of their



responsibilities. OER contractors signed an NDA as a condition of employment with the federal government (this should be confirmed annually).

At the beginning of the expedition, all personnel need to be notified of their responsibilities:

MISSION PERSONNEL (Notified by: Expedition Coordinator)		
Employee	Accountability Mechanism for With-holding Sensitive Data	Action
NOAA Federal Employees	NOAA and Federal Contract	Reminder of contract, and provide archaeology background document.
Mission Contractors (UCAR, ERT Inc., 2020 Company LLC)	Non-Disclosure Agreement	Confirm all contractors signed NDA. Send reminder of contract and provide archaeology background document.
NOAA/Federal Scientists	NOAA and Federal Contract	Reminder of Contract, and provide Archaeology background document
Other Federal Scientists (BOEM, Navy, NPS, etc.)	Federal Contract	Reminder of Contract, and provide Archaeology background document
Other Mission Personnel and Scientists	Non-Disclosure Agreement	Get NDA Signed
Okeanos Explorer Crew (Notified by: CO or Designee)		
NOAA Federal Employees	Subject to NOAA and the ship's communications plans and protocols for sensitive data	CO sends out reminder of contract to ship via All Hands, and provides Archaeology background document
Other Federal Employees (e.g. Public Health Service)	Subject to NOAA and the ship's communications plans and protocols for sensitive data	CO sends out reminder of contract to ship via All Hands, and provides Archaeology background document
Wage Mariners	Subject to NOAA and the ship's communications plans and protocols for sensitive data	CO sends out reminder of contract to ship via All Hands, and provides Archaeology background document

