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Project Instructions: EX-21-06, 2021 U.S. Blake Plateau Mapping 2 (Mapping)

Date Submitted: July 6, 2021

Platform: NOAA Ship *Okeanos Explorer*

Project Number: EX-21-06

Project Title: 2021 U.S. Blake Plateau Mapping 2

Project Dates: September 5 - 30, 2021

Prepared by: Sam Candio **Dated:** 08/10/2021
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Chief, Expeditions and Exploration Division
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Approved by: CHROBAK.NICHOLAS.JAMES.1241660199 Digitally signed by CHROBAK.NICHOLAS.JAMES.1241660199 Date: 2021.08.17 13:57:24 -04'00' **Dated:** _____
Captain Nicholas Chrobak
Commanding Officer
NOAA Marine Operations Center — Atlantic

I. Overview

A. Brief Summary and Project Period

September 5 - 30, 2021
Port Canaveral, Florida - Port Canaveral, Florida
EX-21-06, 2021 U.S. Blake Plateau Mapping 2 (Mapping)

This document contains project instructions specific to EX-21-06. For the annual, cross-expedition details, see the "NOAA Ship *Okeanos Explorer* FY2021 Field Season Instructions". This expedition will commence on September 5, 2021 in Port Canaveral, Florida and conclude on September 30, 2021 in Port Canaveral, Florida. It will include 24-hour-a-day acoustic exploration mapping operations focused on areas generally deeper than 200 m in U.S. waters off the U.S. East Coast with a focus on the Blake Plateau. See Appendix B for the expedition's Data Management Plan.

B. Days at Sea

The 26 days at sea (DAS) scheduled for this expedition are all funded by OAR. Mapping operations are planned 24 hours a day, with a medium operational tempo.

C. Operating Area

EX-21-06 will focus operations on the Blake Plateau within U.S. waters off the East Coast. Priority mapping areas are indicated in **Figure 1**. (The waypoints for the general working area and proposed cruise track are in Appendix A). Mapping operations will build upon coverage obtained during EX-21-05.

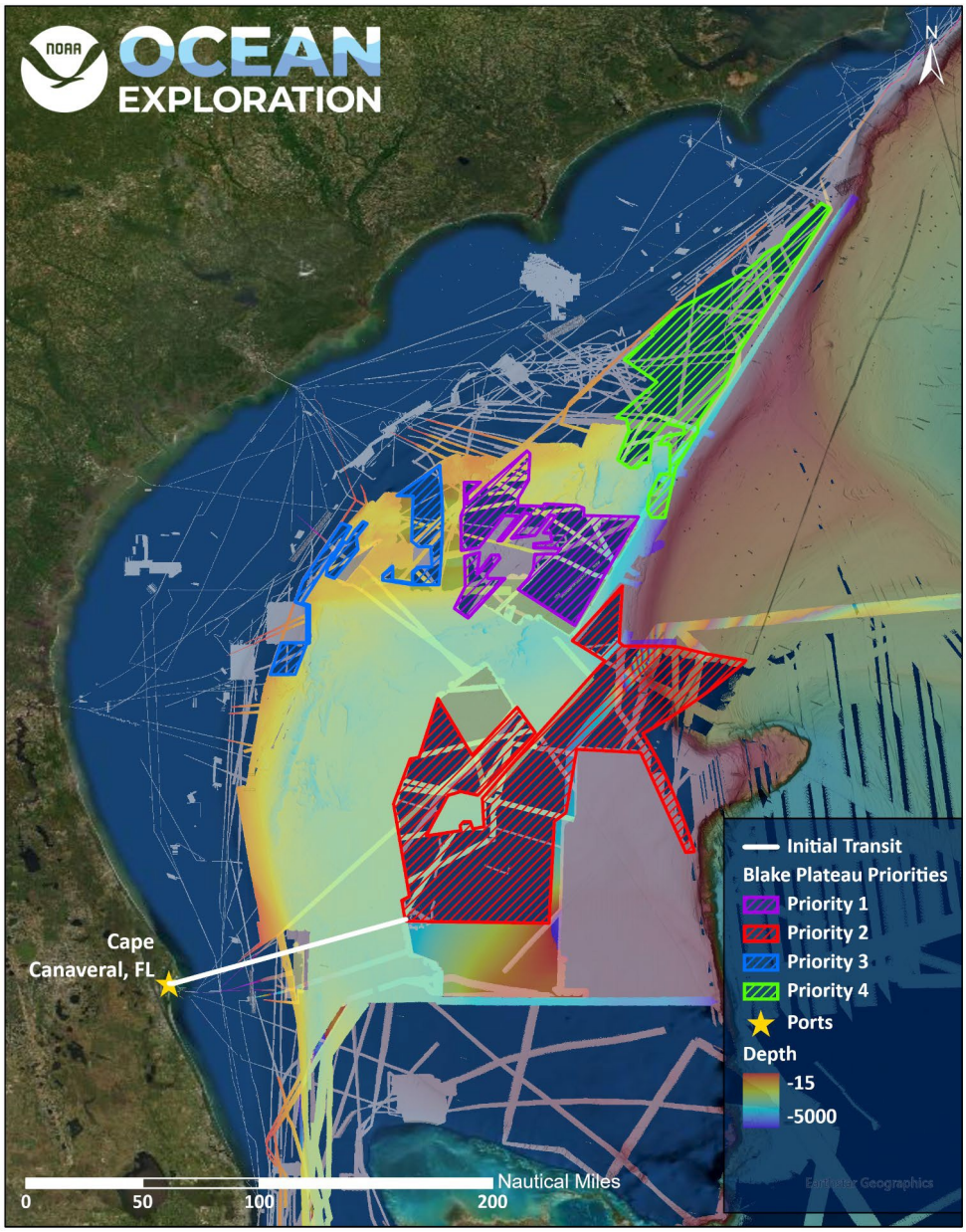

Figure 1. Map showing the general operating area for EX-21-06. Note that the cruise track is subject to change based on survey results, field conditions, and the discretion of the commanding officer.

D. Summary of Objectives

EX-21-06 operations will involve a transit eastward followed by focused ocean mapping operations that will occur on the Blake Plateau, mostly in deep water (>200 m). The

expedition will include 24-hour-a-day exploratory mapping operations to fill mapping gaps. See the "NOAA Ship *Okeanos Explorer* FY2021 Field Season Instructions" for more information.

1. Mapping Objectives

Strategic Transit

- Transit data will aim to address bathymetric gaps, or prioritize areas with poor bathymetric or seabed backscatter data quality.

Acoustic Sonar Objectives

- Conduct 24-hour-per-day mapping operations for the entirety of the cruise. Mapping operations will consist of concurrent data acquisition from the EM 304 multibeam echosounder, EK60/80 split beam echosounder suite, and Knudsen 3260 sub-bottom profiler.
- Collect high-resolution mapping data in priority areas. Focused surveys may also be completed in the contingency areas as time allows, or in order to adapt to adverse weather conditions.
- Execute mapping line plans as defined by onboard personnel, with real time adjustments made to obtain complete seabed coverage as necessary.
- An average survey speed of 8-9 kn will be utilized during mapping operations.
- Transit speeds of 10 kn may be requested in certain areas as feasible.
- Work with the Cloud team ashore to create daily standard bathymetric and backscatter products.
- Review water column data for anomalies.
- Produce jpg images of sub-bottom data.
- Generate final cruise map displaying seabed coverage obtained.
- Test remote watchstanding capabilities of SIS 5 / SIS Remote

Science

- Acquire data on deepwater habitats to support science and management needs.
- Identify, map and explore the diversity and distribution of benthic habitats, including potential deep-sea coral and sponge communities, fish habitats, and chemosynthetic communities.
- Map geologic features to better understand the geological context of the region and improve knowledge of past and potential geohazards.

- Acquire acoustic and oceanographic data as a foundation to better understand the characteristics of the water column and the pelagic fauna that inhabit it.
- Acoustically identify potential underwater cultural heritage (UCH) sites, such as shipwrecks.
- Engage a broad spectrum of the scientific and management community, as well the public in telepresence-based exploration.
- Conduct operations in conjunction with shore-based exploration command centers and remote science team participants.
- Create and provide input into standard science products to provide a foundation of publicly accessible data and information products to spur further exploration, research, and management activities.
- Collect high-resolution bathymetry in areas with no (or low quality) sonar data.
- Test University of New Hampshire Center for Coastal and Ocean Mapping's BathyGapFiller tool for automatically generating lines in areas of no mapping data.

POS IMU

- POS/MV data will be monitored in real time and collected to ensure data quality and watch for potential periodic dropouts that have been reported throughout the fleet.

Sound Speed Profiling

- Collect expendable bathythermograph casts as data quality requires but not more than 6 hours apart.
- Maintain CTD capabilities as a backup sound velocity profiling method for mapping data requirements.

Education

- Train the next generation of ocean explorers by hosting two Explorers-in-Training on the ship. Training will include sonar data acquisition, processing, and documentation according to standard NOAA Ocean Exploration procedures.
- Train 4 EiTs working from home in the cloud. Training will include utilizing cloud technology, and sonar data processing, documentation, and daily product production.

Data Processing/Throughput Testing/Cloud

- Ensure all data processing pipelines and automated transfer to shore for all raw sonar, partially processed (.gsf) and ancillary data types are functioning properly.
- Refine cloud processing capabilities and workflow.

Miscellaneous

- Collect sun photometer measurements as part of an Exploration Project of Opportunity (EPO).

2. Video Engineering Objectives

- Provide onboard support for 24 hour mapping and telepresence mapping objectives.
- Verify Global Foundation for Ocean Exploration (GFOE) managed telepresence systems perform as expected.

3. Network/Onboard Data Objectives

- Ensure Global Foundation for Ocean Exploration (GFOE) managed VSAT, network and computing infrastructure operate as required to meet mission objectives
- Ensure shipboard instruments / teams are producing expected data products at the expected rates according to established conventions
- Ensure data management processes organize, backup and transmit data to shore as expected
- Support shore-based personnel to remotely access shipboard resources to better meet mission objectives
- Cross-train network, system administration and data management personnel
- Improve system documentation

E. Participating Institutions

- National Oceanic and Atmospheric Administration (NOAA), Office of Ocean Exploration and Research (OER) — 1315 East-West Highway, Silver Spring, MD 20910 USA

- University Corporation for Atmospheric Research (UCAR) Programs for Advancement of Earth System Science — P.O. Box 3000, Boulder, CO 80307 USA
- Global Foundation for Ocean Exploration (GFOE) — P.O. Box 417, Mystic, CT 06355 USA
- University of New Hampshire Center for Coastal and Ocean Mapping, 24 Colovos Rd, Durham NH, USA
- University of Rhode Island Inner Space Center, 215 South Ferry Road, Narragansett, RI 02882 USA.

F. Personnel (Mission Party)

Mission personnel not already within the ship's bubble (see **Table 1**) will arrive in Port Canaveral, Florida on August 26, 2021 and shelter in place (SIP) for seven days from August 27 to September 2, 2021. Mission personnel will join the ship on September 3, 2021, after the SIP period and two negative COVID-19 tests. Mission personnel will then be on board for the duration of the expedition (September 3 to September 30, 2021). All personnel will depart on October 1, 2021. 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	Candio, Sam	Expedition Coordinator/Mapping Lead	08/13	10/01	M	OER (CNSP[1])	USA
2	Bittinger, Amanda	Watch Lead	08/13	10/01	F	UCAR	USA
3	Frietas, Daniel	Watch Lead	09/3	10/01	M	UCAR	USA
4	Kim, Edward	Explorer in Training	09/3	10/01	M	UCAR	USA
5	Cook, Madelyn	Explorer in Training	09/3	10/01	F	UCAR	USA
6	Hernandez, Rebekah	Explorer in Training	09/3	10/01	F	UCAR	USA
6	Meyers, Jim	GFOE Team Lead	08/13	10/01	M	GFOE	USA
7	Wright, Chris	GFOE Engineer	08/13	10/01	M	GFOE	USA

8	Bailey, Caitlin	GFOE Engineer	08/13	10/01	F	GFOE	USA
9	Lister, Andy	GFOE Engineer	09/03	10/01	M	GFOE	USA
10	Brian, Roland	GFOE Engineer	09/03	10/01	M	GFOE	USA

[1] Cherokee Nation Strategic Programs

Table 2. Shoreside support personnel and key contacts

#	Name (Last, First)	Title	Affiliation	Nationality
1	Lobecker, Meme	Cloud Manager	OER (CNSP)	USA
2	Peliks, Marcel	Cloud Intern	UCAR	USA
3	Takagi-Berry, Anna	Cloud Intern	UCAR	USA
4	Santiago, Paola	Cloud Intern	UCAR	USA
5	Gillespie, Treyson	Cloud Intern	UCAR	USA

1. Foreign National Guests Access to OMAO Facilities and Platforms

Foreign national access to *Okeanos Explorer* or other federal facilities will not be required for this 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	CDR Fionna 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 Okeanos Explorer	CDR Nicole Manning, Commanding	NOAA Ship Okeanos Explorer	NOAA Ship Okeanos Explorer Attn: Name or	(401) 439-7848	CO.Explorer@noaa.gov

(primary)	Officer		Department 47 Chandler Street Newport, RI 02841		
NOAA Ship Okeanos Explorer (primary)	LT Bryan Pestone, NOAA Operations Officer	NOAA Ship Okeanos Explorer	NOAA Ship Okeanos Explorer Attn: Name or Department 47 Chandler Street Newport, RI 02841	(808) 659-9179 x221	ops.explorer@noaa.gov
Mission (primary)	Sam Candio, Expedition Coordinator	NOAA Ocean Research (CNSP)	24 Colovos Road Durham, NH 03824	(732) 546-2232	samuel.candio@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 Director (Acting)	NOAA Ocean Exploration	1315 East-West Highway, Silver Spring, MD 20910	(301) 452-7366	genene.fisher@noaa.gov
Mission (other)	Meme Lobecker, Cloud Manager (onshore)	NOAA Ocean Exploration (CNSP)	24 Colovos Road Durham, NH 03824	(240) 429-7023	elizabeth.lobecker@noaa.gov

2. Diplomatic Clearances

None required.

3. Licenses and Permits

See Appendix B.

4. Shipments

The *Okeanos Explorer* operations officer should be notified of any shipments to the ship. Send an email describing the shipment (including size and number of items) to OPS.Explorer@noaa.gov.

For shipments to arrive while in port in Port Canaveral, Florida at the start of the expedition, **shipments should arrive no later than September 1, 2021,** and be shipped to the following address:

Contact Operations Officer for the address.

For shipments to arrive while in port in Port Canaveral, Florida after the expedition from September 5 - 30, 2021, **shipments should arrive no later than October 1, 2021,** and should be shipped to the following address:

Contact Operations Officer for the address.

5. COVID-19 Plan for Mission Personnel

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.
- 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 personnel.

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

LTJG Christopher "J" Dunn, NOAA
Expeditions Operations Leader, Expeditions and Exploration Division
NOAA Office of Ocean Exploration and Research
215 South Ferry Road
Narragansett, RI 02882
Desk: (401) 874-6478
Cell: (262) 995-3410

II. Operations

The expedition coordinator is responsible for ensuring mission personnel are trained in planned operations and are knowledgeable about expedition objectives and priorities. The commanding officer is responsible for ensuring all operations conform to the ship's accepted practices and procedures.

A. Expedition Itinerary

Table 4 summarizes the expedition itinerary. All times and dates are subject to prevailing conditions and the discretion of the commanding officer. This is an approximate itinerary and is subject to change based on objective completion.

Table 4. Expedition itinerary

Date	Activities
08/26	Mission personnel not already aboard from EX-21-05 travel to the SIP location in Port Canaveral, Florida.
08/27 - 09/2	SIP for all sailing members joining the ship not already in the bubble.
09/3	Members of the mission team that were in SIP join the ship.
09/4	Expedition mobilization day. Dockside sonar pinging may be requested. Mission personnel orientation meeting. Vessel familiarization meeting with operations officer, executive officer, and safety officer for any new mission personnel. Mapping watch schedule posted.
09/5	First day underway. Depart Cape Canaveral, FL in the morning. Transit mapping as the ship heads eastto primary survey grounds on the Blake Plateau. Safety drills, including donning of survival suits.
09/6 - 09/28	Focused mapping operations on the Blake Plateau. Priorities will depend upon what is completed during EX-21-05.
09/29	Transit mapping back to Cape Canaveral, FL.
09/30	Arrive in Cape Canaveral, FL.

B. Staging and Destaging

Minimal staging and destaging are anticipated for this mapping expedition.

C. Operations To Be Conducted

1. Telepresence/Outreach Events

- Three live video feeds will be used throughout the expedition to provide situational awareness for onshore personnel.
- Sonar data processing using the NOAA Amazon Cloud space by shore-based personnel will be tested and employed throughout the Fiscal Year 2021 field season. This data processing will be managed and overseen by shore-based personnel. This requires 24-hour-a-day delivery to shore of near real-time data from the multibeam, split-beam, and sub-bottom sonars.

2. Port Events and Ship Tours

No public port events or ship tours are planned for this expedition.

3. Special/Unusual Operations or Requests

There are no special or unusual operations or requests for this expedition.

D. SCUBA Dive Plans

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 science dives are planned during EX-21-05, but the ship may plan training, safety drills, or maintenance dives.

E. Applicable Restrictions

Not applicable.

III. Equipment

A detailed list of equipment provided by the ship and OER is in the "NOAA Ship *Okeanos Explorer* FY2021 Field Season Instructions". There are no specific changes relative to this expedition.

IV. Hazardous Materials

A. Policy and Compliance

See the "NOAA Ship *Okeanos Explorer* FY2021 Field Season Instructions".

B. Inventory

Table 5. Inventory of hazardous materials that will Be aboard for EX-21-06.

Item	Use	Approximate Locations
95% denatured ethanol (~230 gal)	Sample preservation	Wetlab, under the chemical hood and in the ETOH storage tank on the O2 deck
Formaldehyde (~2 gal) to be buffered into 10% buffered formalin	Sample preservation	Wetlab, under the chemical hood
Chaos buffer (325 mL) (4 M guanidine thiocyanate, 0.5% N-laurosylsarcosine, 25 mMTris pH 8.0, 0.1 M beta-mercaptoethanol)	Sample preservation	Wetlab, under the chemical hood
AquaShield	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)	Hangar, 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	Hangar, vehicles
Por-15	Paint kit	ROV workshop fire cabinet

Aeroshell 41	Hydraulic fluid	Hangar, ROV *Deep Discoverer*
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
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
Bleach (1 qt)	Sterilization and sample preservation	Cabinet under sink

Appendix A. Waypoints

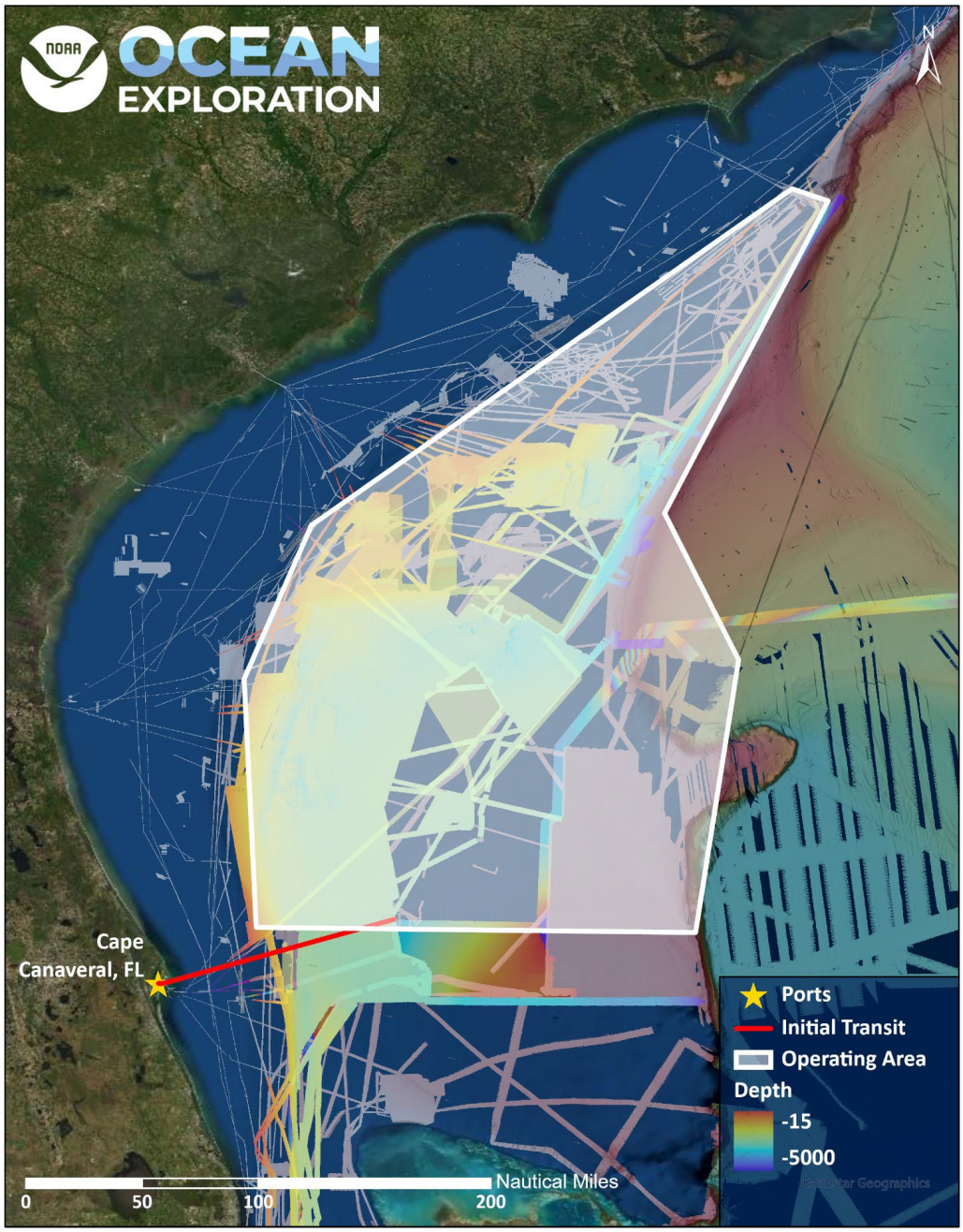

Figure A1 (for reference)**.** Map showing the general operating area for EX-21-06.

Table A1. Waypoints for general working area (white square)

Latitude (DD)	Longitude (DD)
28° 48.625'N	79° 54.586'W
30° 35.1385'W	79° 54.586'W
31° 40.9697'N	79° 30.9163'W
34° 05.2067'N	76° 04.5464'W
34° 00.0291'N	75° 49.0132'W
31° 46.1475'N	76° 59.2826'W
30° 43.2749'N	76° 27.4765'W
28° 46.4060'N	76° 45.9684'W
28° 48.6250'N	79° 54.5860'W

Table A2. Waypoints for proposed cruise track (red line)

Latitude (D DM)	Longitude (D DM)
28° 24.5714'N	80° 36.6577'W
28° 24.5795'N	80° 34.6574'W
28° 52.0660'N	78° 55.3285'W

Appendix B. Data Management Plan

Okeanos Explorer Mission EX2105 Data Management Plan

Report Date: 2021-07-01

1. General Description of Data to be Managed

1.1 Name and Purpose of the Data Collection Project:
EX-21-06, 2021 U.S. Blake Plateau Mapping 2 (Mapping)
EX2106 will include 24-hour-per-day acoustic exploration mapping operations focused on areas generally deeper than 200 m in U.S. waters off the U.S. East Coast with a focus on the Blake Plateau.

1.2 Summary Description of the data to be collected:
Operations for this cruise will be conducted 24 hours per day and consist of mapping operations for 24 hours per day.

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

CTD, EM304, expedition, exploration, explorer, , 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, NOMEC, 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, Seabed 2030, single beam sonar, singlebeam sonar, single-beam sonar, site characterization, sonar anomalies, split beam sonar, stewardship, sub-bottom profile, systematic exploration, technology, undersea, underwater, water column backscatter

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

1.5 Planned or Actual Temporal Coverage of the data:
Start Date: 2021-09-05 and End Date: 2021-09-30

1.6 Actual or Planned Geographic Coverage of the data:
Northernmost Boundary: 32.7 and Southernmost Boundary: 30.6
Westernmost Boundary: -79.9 and Easternmost Boundary: -78.6

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), EK60 Split Beam Data, EK80 Split Beam Data, Multibeam (image), Multibeam (processed), Multibeam (product), Multibeam (raw), Navigational Data, SCS Output (compressed), SCS Output (native), 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

2 Points of Contact for this Data Producing Project

Overall POC: Samuel Candio, Samuel.candio@noaa.gov
Title: Expedition Coordinator
Affiliation: NOAA Office of Ocean Exploration and Research
Phone: (732) 546-2232

3 Points of Contact for Managing the Data

Data POC: Megan Cromwell, Chris Wright
Data POC Title: Stewardship Data Management, Onboard and shoreside data management
Data POC Email: megan.cromwell@noaa.gov, chris.wright@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; 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

6.2 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 .kmall 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.

Appendix C. Licenses, Permits, and Environmental Compliance

Pursuant to the National Environmental Policy Act (NEPA), NOAA Ocean Exploration is required to include in its planning and decision-making processes appropriate and careful consideration of the potential environmental consequences of actions it proposes to fund, authorize, and/or conduct. The companion manual for NOAA Administrative Order 216-6A describes the agency's specific procedures for NEPA compliance.

An environmental review memorandum was completed for NOAA Ocean Exploration expeditions on Okeanos Explorer in 2021 in accordance with Section 4 of the companion manual in the form of a categorical exclusion worksheet. Based on this review, a categorical exclusion was determined to be the appropriate level of NEPA analysis necessary, as no extraordinary circumstances exist that require the preparation of an environmental assessment or environmental impact statement. NOAA Ocean Exploration is preparing a programmatic environmental assessment to cover future expeditions.

As required under Section 7 of the Endangered Species Act (ESA), NOAA Ocean Exploration conducted an informal consultation with NOAA's National Marine Fisheries Service (NMFS) Office of Protected Resources to request their concurrence with NOAA Ocean Exploration's biological evaluation determining that NOAA Ocean Exploration's operations on Okeanos Explorer conducted 2021 may affect, but are not likely to adversely affect, ESA-listed marine species. In a Letter of Concurrence dated February 3, 2021 , the chief of the ESA Interagency Cooperation Division in the NMFS Office of Protected Resources wrote that NMFS concurs with NOAA Ocean Exploration's determination.

In addition, NOAA Ocean Exploration consulted with the NMFS Greater Atlantic Fisheries Office (GARFO) on potential impacts of operations to essential fish habitat (EFH) in the greater Atlantic region under the Magnuson-Stevens Fishery Conservation and Management Act. NOAA Ocean Exploration received a letter of acknowledgement from GARFO on March 10, 2021, that covers expedition activities from April 1, 2021 until September 31, 2021.

Following is a copy of the NEPA Categorical Exclusion. The Endangered Species Act (ESA) Section 7 Letter of Concurrence and a Letter of Acknowledgement from the Greater Atlantic Regional Fisheries Office (GARFO) are in the "NOAA Ship Okeanos Explorer FY2021 Field Season Instructions".

Categorical Exclusion (CE) Evaluation Worksheet

Project Identifier: EX2106

Date Review Completed: 6/22/2021

Completed by: Amanda Maxon, OER Environmental Compliance Specialist, Contractor

OAR Functional Area: OER

Worksheet File Name: 2021-05-OER-G3-EX2106

Step 1. CE applicability

1. **Is this federal financial assistance, including via grants, cooperative agreements, loans, loan guarantees, interest subsidies, insurance, food commodities, direct appropriations, and transfers of property in place of money?**

   no

2. **What is the proposed federal action?**

   The proposed action is the NOAA's Office of Exploration and Research (OER) to complete a mapping expedition using the NOAA Ship Okeanos Explorer's scientific sonar systems (Kongsberg EM304 multibeam, Simrad EK60 and EK80 split-beam, Knudsen 3260 chirp sub-bottom profiler, and Teledyne Acoustic Doppler Current Profiler). During expedition EX-21-06, the proposed actions of the cruise include acoustic exploration mapping operations forums on areas generally deeper than 200m in U.S. waters off the U.S. East Coast with a focus on the Blake Plateau 24 hours per day. The expedition will start on September 2, 2021 in Port Canaveral, Florida and will conclude on September 30, 2021 in Port Canaveral, Florida. The exact start and end dates may vary by a few days or weeks depending on weather and other logistical considerations.

   EX-21-06 will focus operations in U.S. waters off the U.S. East Coast with the focus on the Blake Plateau. Mapping operations will be conducted at depths between 200 and 6,000 m. With actions demonstrating independent utility and is not connected to any other federal action.

3. **Which class of CE in Appendix E of the NAO 216-6A Companion Manual is applicable to this action and why?**

   a. G3: Topographic, bathymetric, land use and land cover, geological, hydrologic mapping, charting, and surveying services that do not involve major surface or subsurface land disturbance and involve no permanent physical, chemical, or biological change to the environment.

   b. The topical scope for this action is consistent with the CE number G3 in Appendix E of the Companion Manual to NOAA Administrative Order (NAO) 216-6A: Topographic, bathymetric, land use and land cover, geological, hydrologic mapping, charting, and surveying services that do not involve major surface or subsurface land disturbance and involve no permanent physical, chemical, or biological change to the environment. These expeditions will conduct calibrations of sonars which will involve no permanent physical, chemical, or biological changes to the environment in areas deeper than 200 meters in depth. EX-21-06 will focus on performing mapping survey operations in U.S. waters off East Coast within the Blake Plateau which would not involve surface or land disturbance causing permanent changes to the environment.

Step 2. Extraordinary Circumstances Consideration

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

   No, the actions of the NOAA Ship Okeanos Explorer operating in remote deep-sea (>200m) areas located off the U.S. East Coast with a focus on the Blake Plateau. All operations are underwater and, therefore, have no human presence. The vessel will transit through different depths as it moves from the ports of call to the areas of operations in deeper waters. These actions do not involve any procedures or outcomes known to result in impacts on human health and safety.

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

   Data collection will primarily focus offshore in deep waters (greater than 200 meters), including areas offshore the U.S. East Coast with a focus on the Blake Plateau the effects will be negligible, as acoustic mapping and ROV operations are transient and will not cause any permanent impact on the seabed or water column. OER's operations are well-documented and follow the accepted best management practices for all operations conducted onboard the vessel. The expedition is planned and reviewed before operations are conducted in order to determine whether there would be the potential for adverse effects on the area.

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

OER has taken measures to ensure that any effects on species or habitats protected by the ESA, MMPA, MSA or NMSA meet the definition of negligible. In 2018, an informal consultation was initiated under Section 7 of the Endangered Species Act (ESA), requesting NOAA Fisheries' Protected Resources Division concurrence with our Biological Evaluation determining that NOAA Ship Okeanos Explorer operations conducted during the 2018-2019 field seasons are not likely to adversely affect ESA-listed marine species. The informal consultation was completed on August 8, 2018 when OER received a signed letter from the Chief ESA Interagency Cooperation Division in the NOAA Office of Protected Species, stating that NMFS concurs with OER's determination that operations conducted during NOAA Ship Okeanos Explorer 2018-2019 field seasons are not likely to adversely affect ESA-listed marine species. A Re-initiation of ESA Section 7 Letter of Concurrence was completed for the FY20 cruise season. ESA Section 7 Letter of Concurrence was received for the Okeanos Explorer's FY21 field season on February 4, 2021 which incorporated the usage of new technologies and regions of interest. The ESA Section 7 Letter of Concurrence will be provided in the FY21 Field Season Instructions.

Given the offshore focus of most of our proposed work, it is improbable that we will encounter marine mammals protected under the MMPA, or sea birds protected under the MBTA. If we did encounter any such protected animals, our impacts would be negligible because of the best management practices to which we adhere to avoid or minimize environmental impacts. These best management practices are all outlined in the Field Season Instructions. OER also initiated a request for an abbreviated Essential Fish Habitat (EFH) consultation for expeditions by NOAA Ship Okeanos Explorer in 2021 to the Greater Atlantic Region. OER is currently in the process of requesting a Letter of Acknowledgement from the Assistant Regional Administrator for the NOAA Office of Habitat Conservation stating that these expeditions will not adversely impact EFH. This letter will be provided in appendices of the EX FY21 Project Instructions.

7. **Would the action result in the potential to generate, use, store, transport, or dispose of hazardous or toxic substances, in a manner that may have a significant effect on the environment?**

The operations of the expedition will be in compliance with FEC 07 Hazardous Materials and Hazardous Waste Management Requirements for Visiting Scientific Parties (or the OMAO procedure that supersedes it) to ensure generation, use, storage, transport, and disposal of such substances will not result in significant impacts.

8. **Would the action result in adverse effects on properties listed or eligible for listing on the National Register of Historic Places authorized by the National Historic Preservation Act of 1966, National Historic Landmarks designated by the Secretary**

of the Interior, or National Monuments designated through the Antiquities Act of 1906; Federally recognized Tribal and Native Alaskan lands, cultural or natural resources, or religious or cultural sites that cannot be resolved through applicable regulatory processes?

The proposed action will not result in adverse effects that cannot be resolved through applicable regulatory processes since we will not be operating within listed or eligible properties, lands, resources or sites coming under the umbrella of protection referenced above.

9. **Would the action result in a disproportionately high and adverse effect on the health or the environment of minority or low-income communities, compared to the impacts on other communities (EO 12898)?**

NOAA Ship Okeanos Explorer will be operating in remote and offshore areas off the U.S. East Coast with a focus on the Blake Plateau region. There are no communities within or near the geographic scope of the expedition, and the mission does not involve actions known or likely to result in adverse impacts on human health.

10. **Would the action contribute to the introduction, continued existence, or spread of noxious weeds or nonnative invasive species known to occur in the area or actions that may promote the introduction, growth, or expansion of the range of the species?**

During EX-21-06, NOAA Ship Okeanos Explorer will not make landfall in areas other than commercial ports. The ship and OER mission team will comply with all applicable local and federal regulations regarding the prevention or spread of invasive species. At the completion of every ROV dive or CTD cast, the equipment will be thoroughly rinsed with fresh water and completely dried to prevent spreading organisms from one site to another. Also the Engineering Department aboard the NOAA Ship Okeanos Explorer attends yearly Ballas Management Training in accordance with NOAA Form 57-07-13 NPDES VGP Annual Inspection and Report to prevent the introduction of invasive species.

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

The proposed actions will not result in any Federal, State, or local law violations or requirements imposed for protection of the environment. OER engaged in the requisite consultations on ESA Section-7 EFH, and MMPA for this expedition as outlined in questions 4-6 above.

12. Would the action result in highly controversial environmental effects?

No, the exploration activities would be localized and will be short in duration in any particular area, due to the vessel continuous transit during operations. Resulting in no notable or lasting changes to the environment due to the short duration and well documented equipment used during operations. Given the project's scope and breath, no notable or lasting changes or highly controversial effects to the environment will result.

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

While each cruise contributes to the overarching goal of exploring, mapping, and sampling the ocean, every cruise is independently useful and not connected to subsequent federal actions.

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

The techniques and equipment used are standard for this type of field study, and the effects are well known.

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

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

CE Determination

☑I have determined that a Categorical Exclusion is the appropriate level of NEPA analysis for this action and that no extraordinary circumstances exist that would require preparation of an environmental assessment or environmental impact statement.

☐I have determined that an environmental assessment or environmental impact statement is required for this action.

Signature:

Signed by: LYNCH.TERENCE.L.DR.1377202895

Date Signed: Digitally signed by LYNCH.TERENCE.L.DR.1377202895 Date: 2021.06.25 17:50:03 -04'00'