

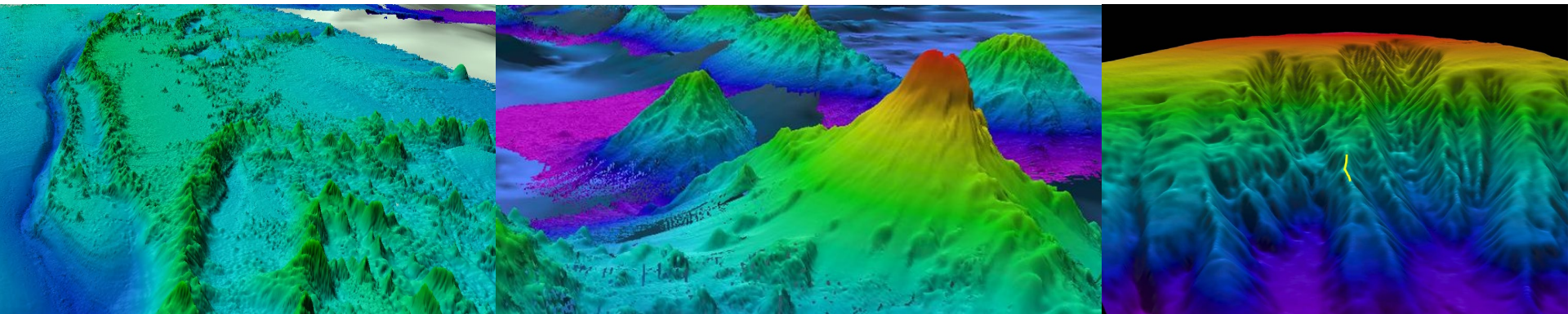
NOAA Office of Ocean Exploration and Research

Deepwater Exploration Mapping Procedures Manual

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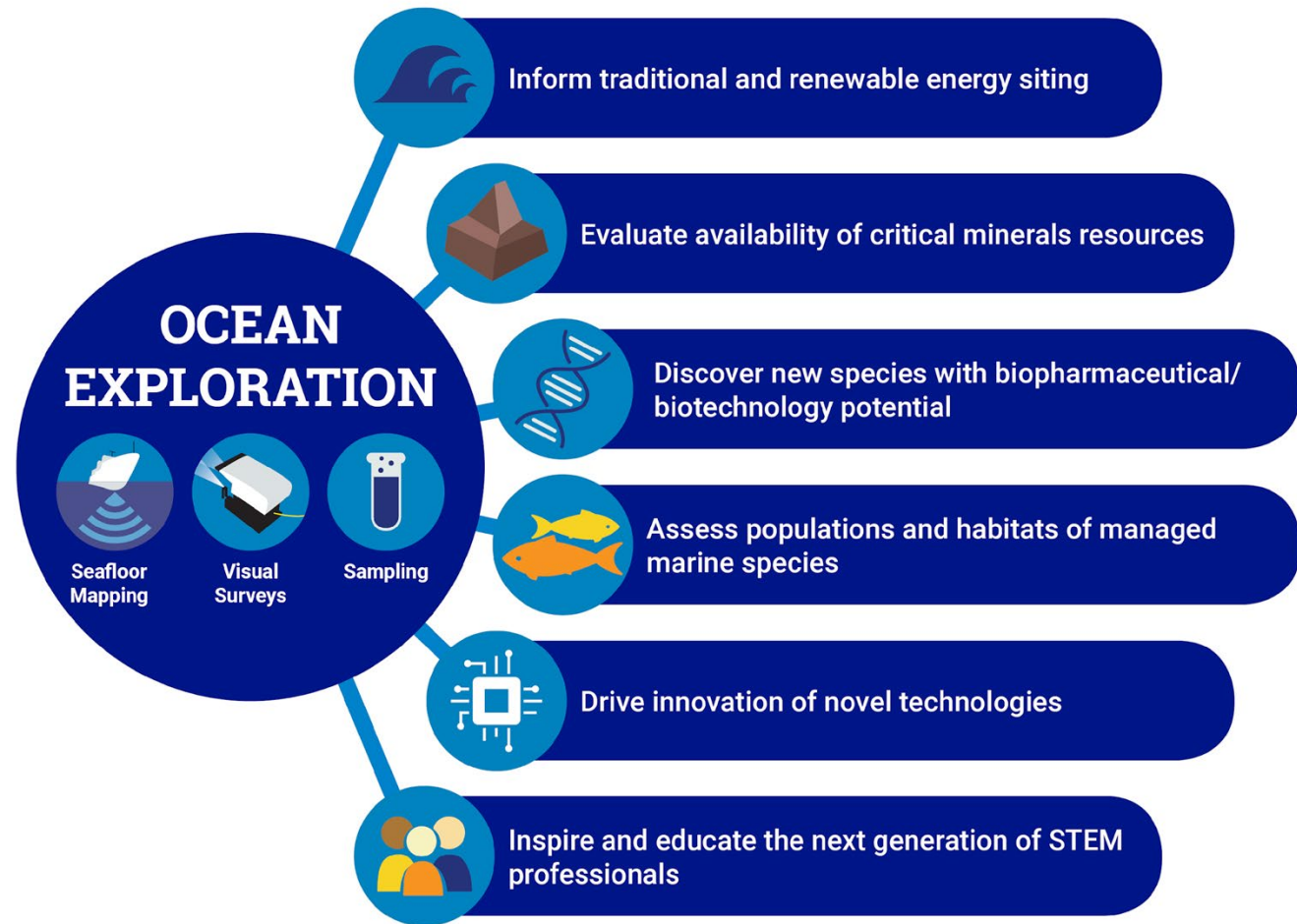
A Bit About Me



- Mapping Expedition Coordinator for NOAA OER (CNSP)
- Master's Student at University of New Hampshire
- BS in Marine Biology from College of Charleston
- Over 10 years of deepwater mapping experience aboard numerous vessels (including an internship with OER in 2010!)
- Previously worked for USGS and University of Bristol

NOAA Office of Ocean Exploration and Research

NOAA's Office of Ocean Exploration and Research is the only U.S. federal organization dedicated to exploring our largely unknown ocean, specifically in waters deeper than 200 meters.



NOAA Ship *Okeanos Explorer*



Okeanos Explorer Mapping Capabilities

- **EM 304 Multibeam Sonar**
(bathymetry, seabed and water column backscatter)
- **Knudsen 3260 Sub-bottom Profiler**
(sub-bottom)
- **EK 60/80 Split-beam Echosounders**
(18, 38, 70, 120, 200 kHz; water column)
- **ADCPs** (38 and 300 kHz; current profiling)
- **Kongsberg Synchronizing Unit**



Deepwater Exploration Mapping Procedures Manual

<https://oceanexplorer.noaa.gov/data/publications/mapping-procedures.html>



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NOAA OER Deepwater Exploration Mapping Procedures Manual

Download the [current version of the NOAA OER Deepwater Exploration Mapping Procedures Manual \(pdf, 2.1 MB\)](#).

With less than 20% of our world ocean's seafloor mapped to modern standards, seafloor mapping is a national and international priority. As emphasized by the U.S. [National Strategy for Mapping, Exploring, and Characterizing the United States Exclusive Economic Zone and Seabed 2030](#) , the monumental task of mapping the seafloor requires a collective, coordinated, and collaborative approach.

For more than 10 years, the NOAA Office of Ocean Exploration and Research (OER) has been conducting exploratory mapping operations throughout U.S. waters and in other parts of the world's ocean aboard [NOAA Ship *Okeanos Explorer*](#). Based on this experience, OER produced a manual that describes the office's approach to deepwater ocean exploration acoustic mapping.

The comprehensive manual describes methodologies for data acquisition, processing, reporting, and archiving for ship-based exploratory ocean mapping operations deeper than 200 meters (656 feet). In the context of the U.S. national strategy and Seabed 2030, OER is sharing this manual as a contribution to broader efforts to develop standard ocean mapping protocols and to serve as a guide for other interested public and private entities conducting deepwater mapping and exploration.



Material Covered

- Overview of OER and our operations
- Our Principles of Exploration Mapping
- Equipment Setup
- Vessel Offsets, Equipment Calibration and Maintenance
- Data Acquisition
- Data Processing
- Reporting and Documentation
- Data Archiving
- Bonus Appedicies: Watchstanding Checklist, Detailed Data Package, Detailed Reporting Requirements, List of Proprietary and Non Proprietary Software used/capable of opening data formats



Detailed Description of Typical Data Package

- EX1907
 - EX1907_MB_001
 - Ancillary
 - BISTs
 - PU parameters
 - Telnet
 - Data acquisition and processing logs*
 - Level_00
 - Level_01
 - Level_02
 - Backscatter
 - ROV_dive_bathymetry
 - EX1907_SB_001
 - Ancillary
 - Calibration
 - Data acquisition and processing logs*
 - Level_00
 - EX1907_SBP_001
 - Ancillary
 - Data acquisition and processing logs*
 - Level_00
 - Level_01
 - EX1907_WCP_001
 - Ancillary
 - Data acquisition and processing logs*
 - Profile data
 - EX1907_WCS_WCD_001
 - Ancillary
 - BISTs
 - PU parameters
 - Telnet
 - Data acquisition and processing logs*
 - Level_00
 - Level_01

Dataset 1: EM 304 Multibeam Bathymetric and Bottom Backscatter Dataset

EX1907	Folder including associated logs and ancillary files.
EX1907_MB_001	
<ul style="list-style-type: none"> - Ancillary <ul style="list-style-type: none"> Mapping watchstander log (.xlsx) Weather log (.pdf or .xlsx) Sound speed profile log (.xlsx) Multibeam acquisition and processing log (.xlsx) bscorr.txt • BISTs <ul style="list-style-type: none"> Built-in self tests (.txt) • PU_parameters <ul style="list-style-type: none"> Processor unit parameters (.txt) • Telnet <ul style="list-style-type: none"> Telnet sessions (.txt) 	<p>Running log for any mapping-related events. Includes information relevant to all sonars.</p> <p>Weather log maintained by the ship's officers.</p> <p>Metadata for sound speed profile casts, including which multibeam line they were first applied to.</p> <p>Acquisition and processing log for every multibeam file, including specific parameters for each file, processing record, and any derived products.</p> <p>Backscatter correction file for normalization of sonar system parameters, such as pulse mode.</p> <p>Folder containing EM 304 built-in self tests. Text files for all BISTs.</p> <p>Folder containing EM 304 processing unit parameters. Typically, one file for pre-cruise configuration and one for post-cruise configuration.</p> <p>Folder containing EM 304 telnet sessions. Text files for all telnet sessions.</p>



Always Collect Data



Systematically Maximize Coverage



Collect Useful and Quality Data



Produce Useful Products



Report Necessary Metadata

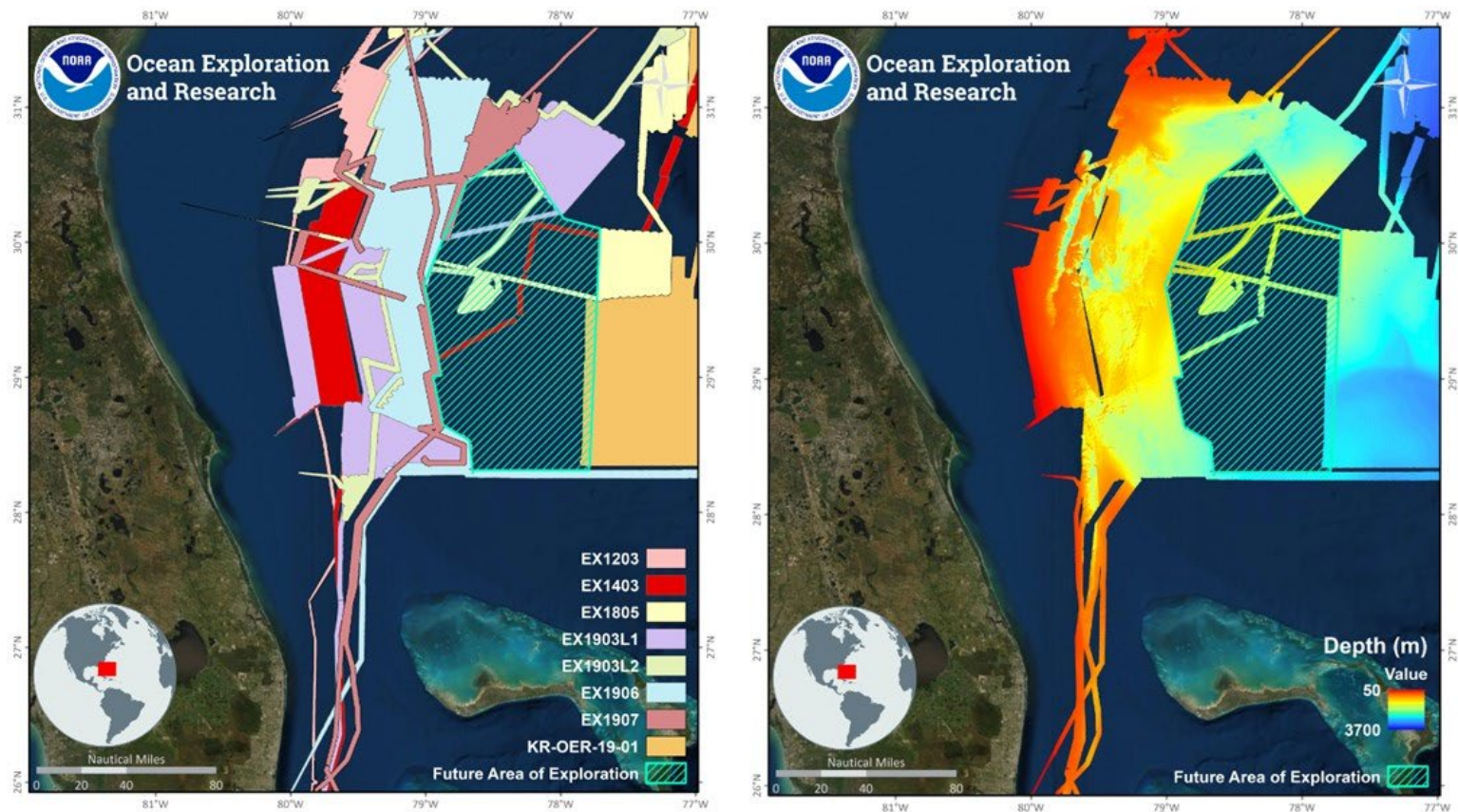


Release in a Timely Manner

Principles of Exploration Mapping

Principles in Action

Systematic Mapping Coverage on the Blake Plateau Expeditions Supported by OER



Resource for the Community

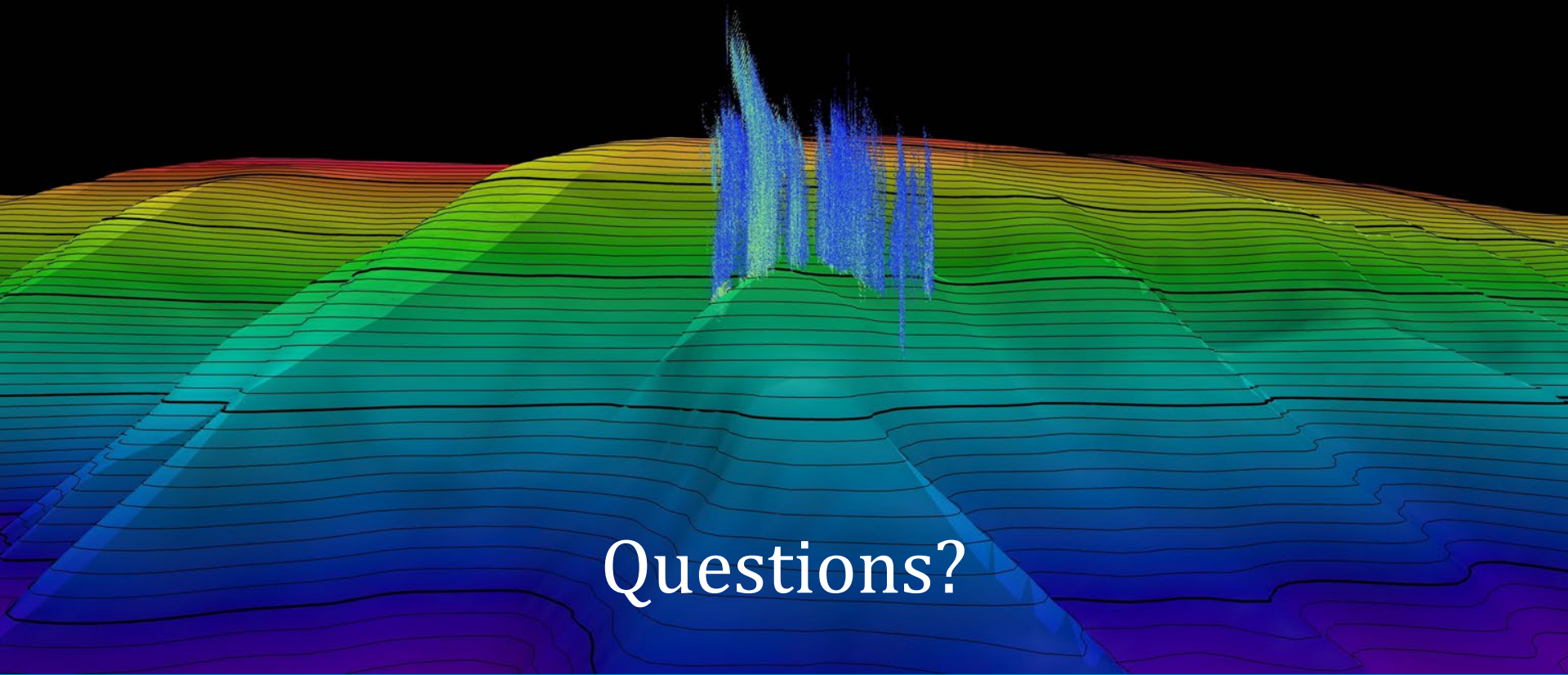
Procedures Manual:

- Will evolve as collective knowledge and technologies advance. (Link on website will always go to current version.)
- Available for all, hopeful that it can be helpful for creation of broader ocean mapping documents.
- A step in the direction of supporting comparable data collection by varying deepwater platforms.



<http://maritime-connector.com/wiki/navy-ships/>

<https://oceanexplorer.noaa.gov/data/publications/mapping-procedures.html>



Questions?

OceanExplorer.NOAA.gov



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