NOAA HSRP February 2023 Public Meeting: Standard Ocean Mapping Protocol (SOMP) Update and Request for Review

Ashley Chappell
NOAA Integrated Ocean & Coastal Mapping (IOCM)

Outline:

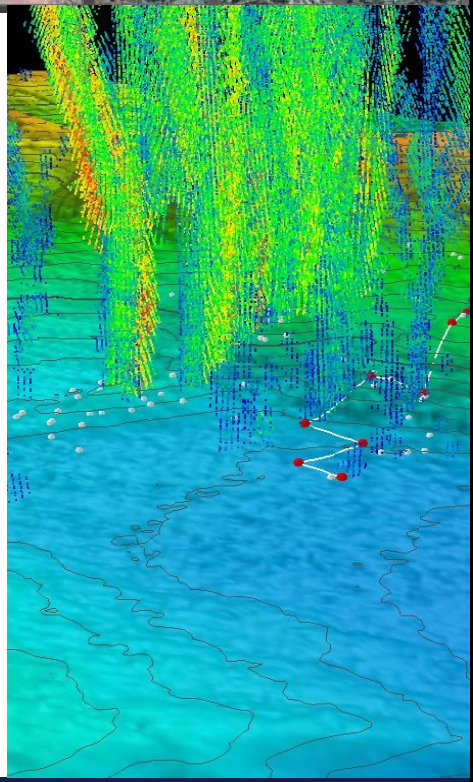
National Ocean Mapping, Exploration and Characterization (NOMEC) Strategy

Standard Ocean Mapping Protocol (SOMP) Summary & Goals

SOMP Chapters

Data Management, Bathymetry, Seabed and Lakebed Backscatter, Water Column, Side Scan Sonar, Sub-bottom Profiler, and Magnetometer

SOMP Status and Next Steps



Goals of the NOMEC Strategy/Implementation

GOALS

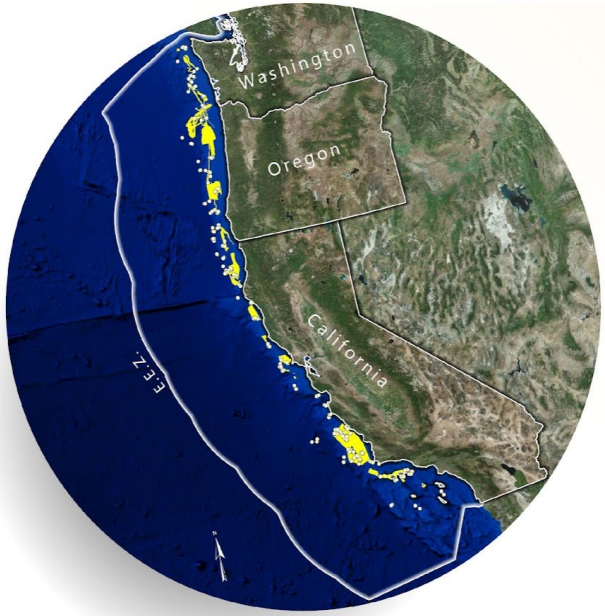
1. Coordinate Interagency Efforts and Resources to Map, Explore, and Characterize the United States EEZ
2. Map the United States EEZ — 2.1: Develop a Standard Ocean Mapping Protocol
3. Explore and Characterize Priority Areas of the United States EEZ
4. Develop and Mature New and Emerging Science and Technologies to Map, Explore, and Characterize the United States EEZ
5. Build Public and Private Partnerships to Map, Explore, and Characterize the United States EEZ

What is the Standard Ocean Mapping Protocol (SOMP)

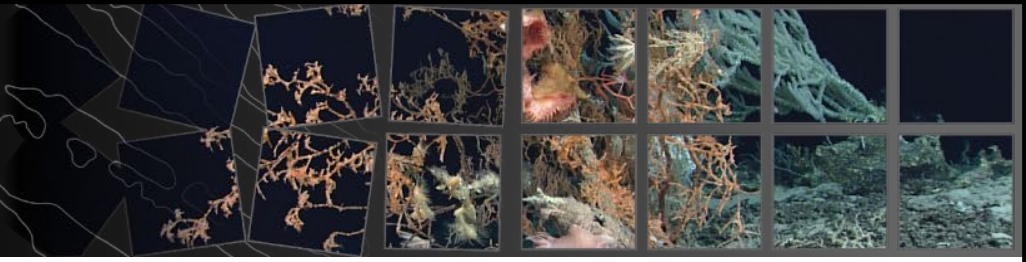
The SOMP is a standardized technical protocol for ocean and coastal mapping data that provides national standards and best practices to guide all ocean mappers in data acquisition, processing, and archiving.

It covers:

- Data Management
- Bathymetry (acoustic and lidar)
- Seabed and Lakebed Backscatter
- Water Column Data
- Side Scan Sonar
- Sub-bottom
- Magnetometer



Why have a SOMP?



- **The National Ocean Mapping, Exploration and Characterization Strategy says so:**
  - Goal 2: Map the United States EEZ, Objective 2.1:

    *The Interagency Working Group on Ocean and Coastal Mapping will **Establish a Standard Ocean Mapping Protocol (SOMP)***

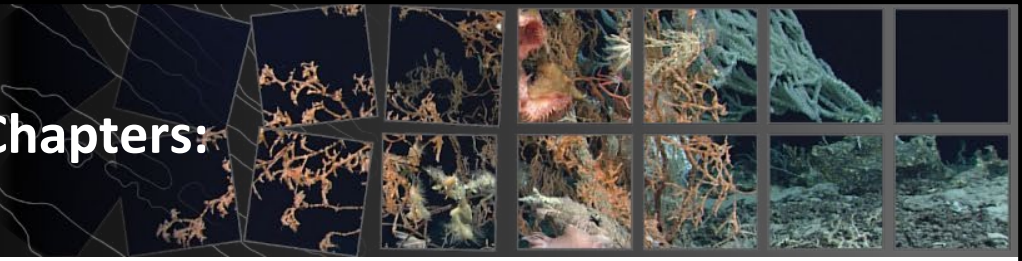
- **The SOMP is essential on its own merits and in demand by federal and partner ocean and coastal mapping entities:**

  The main goals of the SOMP are to facilitate the widest access to, use of, and integration of data; minimize duplication of effort; and maximize the efficient collection, processing, publishing, preserving, and stewardship of as much ocean and coastal mapping data as possible into publicly-accessible archives, repositories, and databases.

How was the SOMP developed?

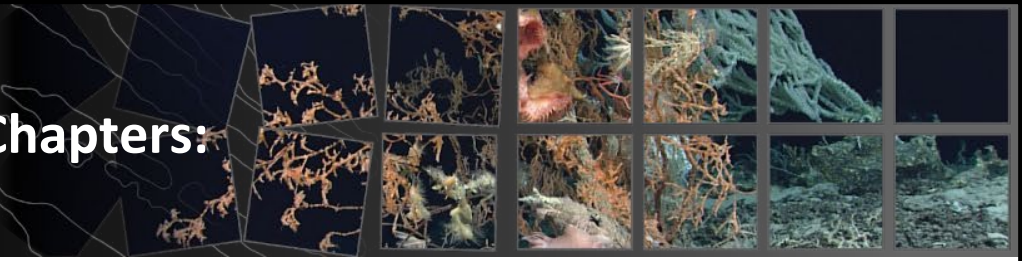
- The SOMP leverages expertise in the field of ocean and coastal mapping across sectors including government, industry, and academia, as well as existing mapping standard documents and procedures and endorses National data standards and best practices following the Geospatial Data Act of 2018: https://www.fgdc.gov/gda/geospatial-data-act-of-2018.pdf
- Robust public SOMP Symposium and comment period held in October 2020
- **SOMP Writing Team established:**
  - The SOMP writing team was largely made-up of IWG-OCM members and contributing SME's from the partnering Federal Agencies on the IWG-OCM
  - Chapter leads and contributors for the 7 components
- Will be updated by the IWG-OCM every five years to keep current with technological advancements

Standard Ocean Mapping Protocol Chapters: Bathymetry



Bathymetry - Procedures for collection, processing, and delivery of bathymetric data, such as that acquired by sonar systems (multibeam, single beam, phase-discriminating) and light detection and ranging (lidar) systems. Summarizes best practices for system setup, calibration, and maintenance; data resolution, range, and survey coverage; positioning and spatial reference; sound speed correction; tides and water levels; Quality Assurance / Quality Control (QA/QC) techniques, accuracy, and uncertainty; data processing and handling, and general gridded data specifications.

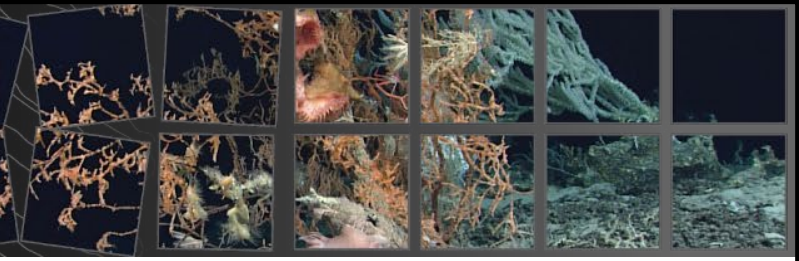
Standard Ocean Mapping Protocol Chapters: Backscatter, Water Column



Seabed and Lakebed Backscatter – Discusses existing challenges in data usage, protocols to apply, and information that should be documented during surveying and processing. The chapter advocates for following the GeoHab Backscatter Working Group publication "Backscatter Measurements by Seafloor-Mapping Sonar: Guidelines and Recommendations" (Lurton,X.;Lamarche,G.(Eds)(2015)) as best practices.

Water Column Sonar - System configuration and calibration, operating frequencies and depth ranges, QA/QC techniques, analysis and interpretation of backscatter and derived products, and file formats.

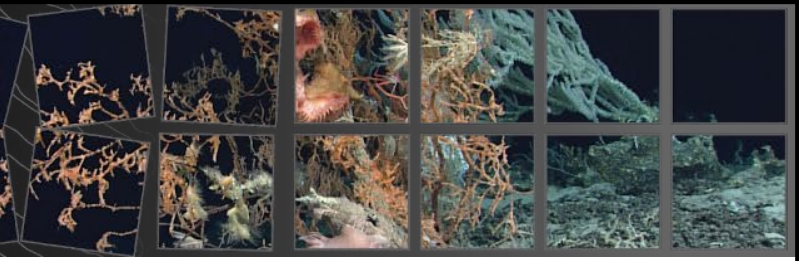
Standard Ocean Mapping Protocol Chapters: Side Scan, Sub-bottom



Side Scan Sonar - System configuration and calibration; general data acquisition parameters (e.g. range scales, frequencies, ping rates, survey speed); data resolution and survey coverage; positioning and spatial reference; target detection; QA/QC techniques, accuracy, and uncertainty; data processing, mosaic generation and derivation of products.

Sub-bottom Profiling - Common system types and standard operating procedure for single-channel acoustic systems that commonly operate in the 0.2 to 24 kilohertz (kHz) frequency range to remotely image seafloor surface morphology and near-surface stratigraphy. Topics include practical survey design, conventional acquisition procedures and parameters, data resolution, QA/QC techniques, processing protocols, data formats, and publication of sub-surface imaging data.

Standard Ocean Mapping Protocol Chapters: Magnetometer, Data Management

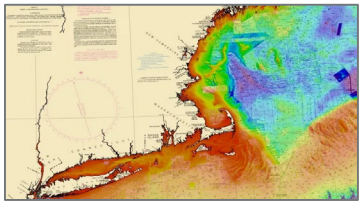


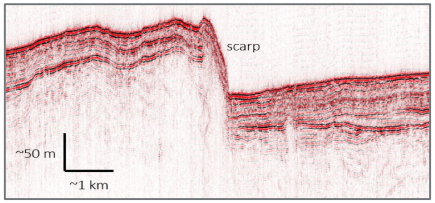
Magnetometer - General magnetic theory as it relates to anomaly detectability, factors that influence data quality, instrument selection, configuration, testing, and calibration; data sensitivity and coverage specifications; resolution/line spacing based on survey objectives; and data validation.

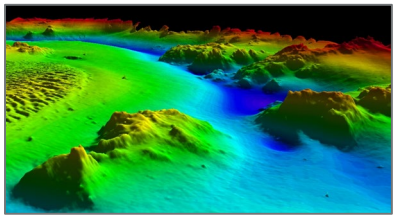
Data Management - Methods for effective data management and stewardship, metadata records, and archive techniques, all with the intent of promoting data accessibility and utility by a broad spectrum of users, including the public.

WHERE and WHEN: SOMP Status and Next Steps

- Federal Registry Notice (FRN) for 90-day public comment period was released on 2/24/23
  - https://www.federalregister.gov/documents/2023/02/24/2023-03795/request-for-public-comment-on-a-draft-standard-ocean-mapping-protocol
- SOMP provided to HSRP on 2/28/23
- **Formal request: HSRP review and insights**
  - **By June 2023 if possible**
- SOMP will be updated after HSRP and public comment
  - Will re-circulate for agency review before final posted



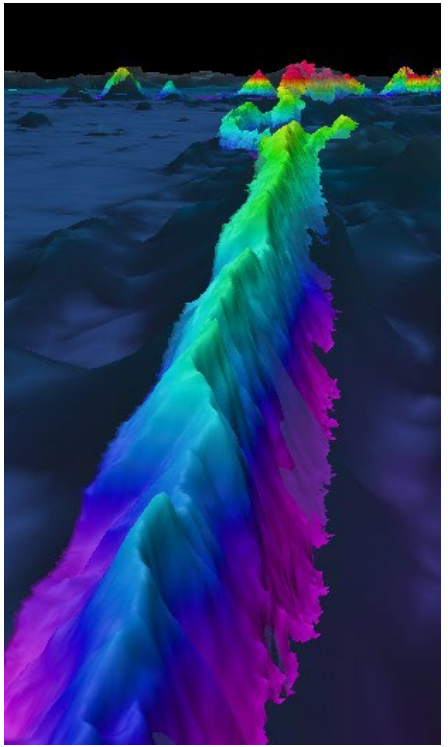




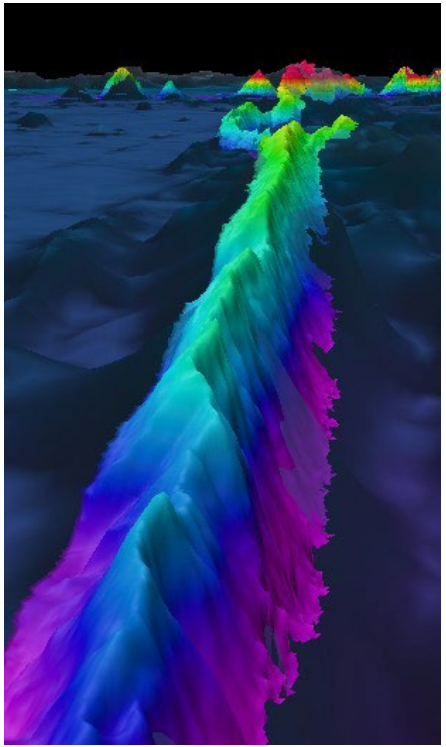
Standard Ocean Mapping Protocol (SOMP)

Thank you!

Ashley.Chappell@noaa.gov



Back-Up Slides



NOMEC Council Structure

Co-Chairs

NOAA – National Oceanic and Atmospheric Administration – U.S. Department of Commerce

USGS – science for a changing world

BOEM – Bureau of Ocean Energy Management

NSF

Department of Defense – United States of America

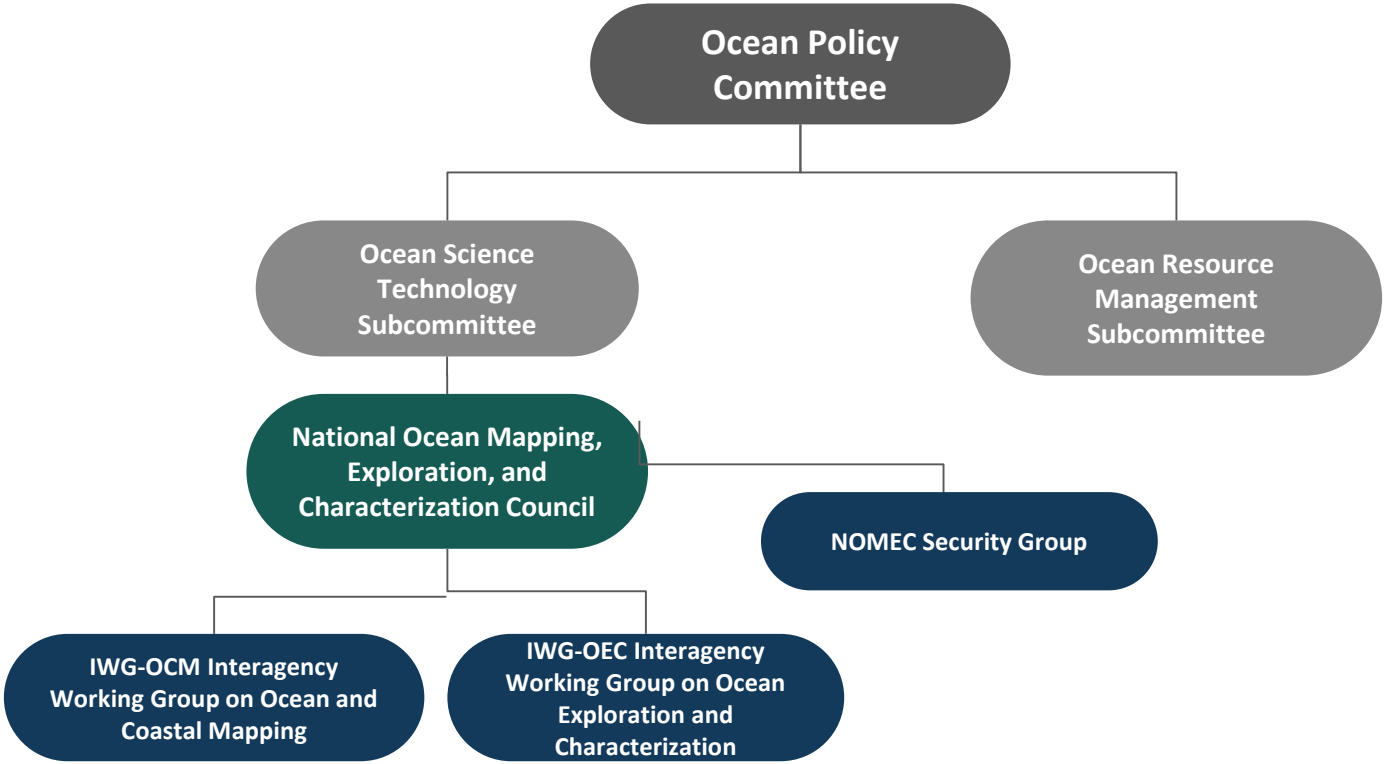
National Maritime Intelligence-Integration Office – United States of America

NASA

United States Coast Guard – 1790

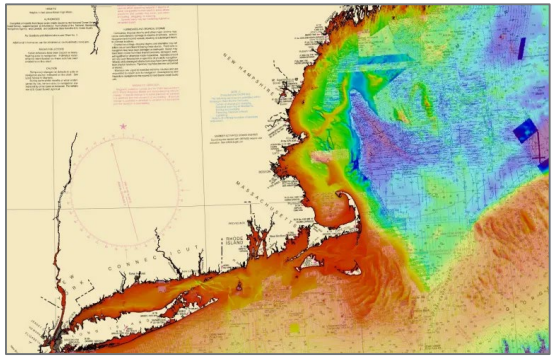
Maritime Administration – 1950 – United States of America

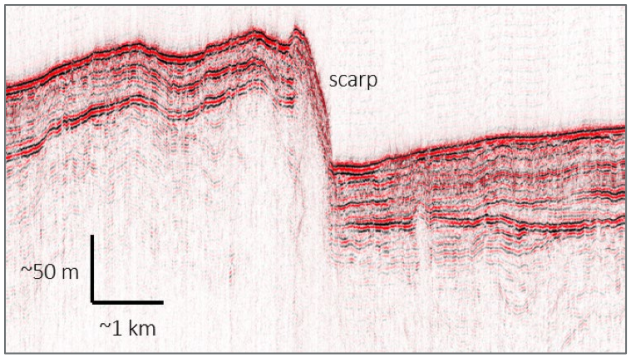
NOMEC Council Structure

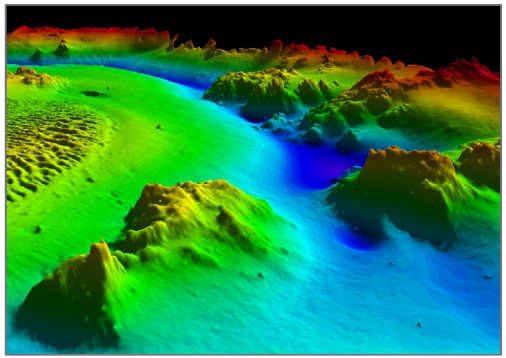


What is Ocean Mapping?

Ocean mapping provides comprehensive data and information needed to understand seafloor characteristics such as depth, topography, bottom type, sediment composition and distribution, and underlying geologic structure.

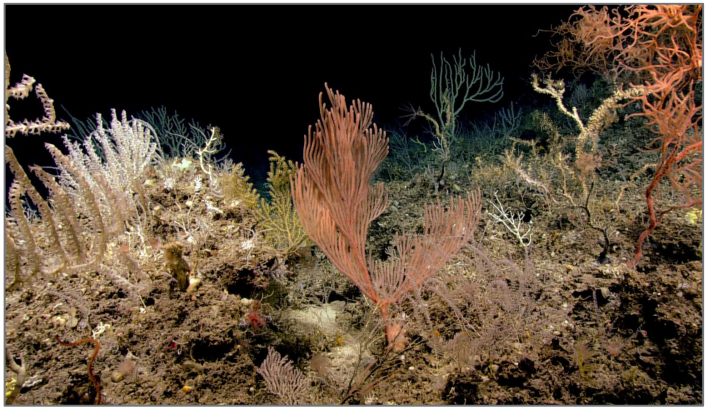


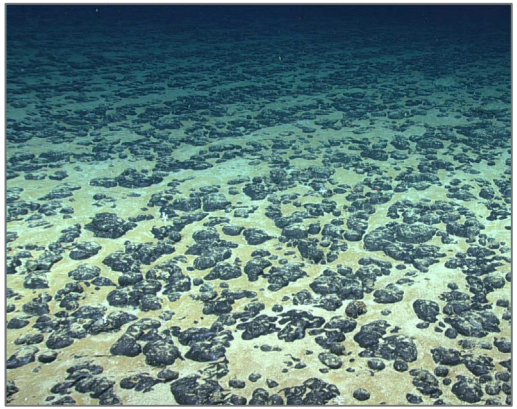




What is Ocean Exploration?

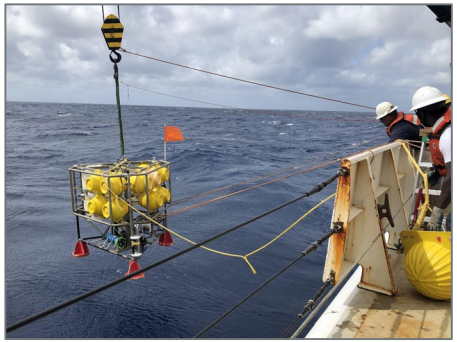
Ocean exploration provides a multidisciplinary first look at an unknown or poorly understood area of the seafloor, sub-bottom, and/or water column and an initial assessment of an area's physical, chemical, and biological characteristics.

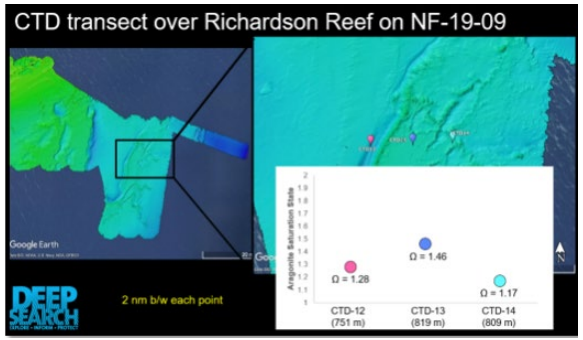


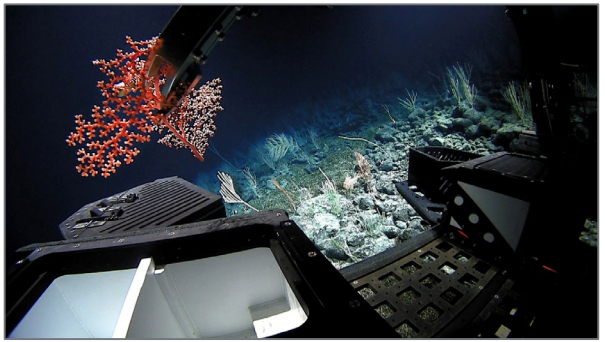


What is Ocean Characterization?

Ocean characterization provides comprehensive data and interpretations for a specific area of interest of the seafloor, sub-bottom, and/or water column, in direct support of specific research, resource management, policymaking, or applied mission objectives.







National Ocean Mapping, Exploration, and Characterization Council

- **Background:** Established to coordinate federal agency policy and actions to advance ocean mapping, exploration, and characterization, and to support collaboration with non-federal and non-governmental partners and stakeholders.

- **The NOMEC Council** reports to the Ocean Science and Technology Subcommittee (OST).

- **Interagency Working Group on Ocean and Coastal Mapping (IWG-OCM):**
  The IWG-OCM was established in 2006 to facilitate the coordination of ocean and coastal mapping activities and avoid duplicating mapping across the federal sector, State, industry, academic, and non-governmental mapping interests. The IWG-OCM reports to the NOMEC Council on NOMEC activities, primarily Goals 2 and 4.

  Please visit the following link for more information: IWG-OCM

Interagency Working Group on Ocean and Coastal Mapping Members

National Strategy for Mapping, Exploration and Characterization the U.S. EEZ (NOMEC Strategy)

The NOMEC Strategy sets forth a national strategy for mapping, exploring, and characterizing the U.S. EEZ and for enhancing opportunities for collaboration among interagency and non-United States Government entities with respect to those activities. The Strategy advances five goals, each supported by strategic objectives:

Goal 1: Coordinate Interagency Efforts and Resources to Map, Explore, and Characterize the United States EEZ

Goal 2: Map the United States EEZ: ***2.1 Establish a Standard Ocean Mapping Protocol (SOMP)***

Goal 3: Explore and Characterize Priority Areas of the United States EEZ

Goal 4: Develop and Mature New and Emerging Science and Technologies to Map, Explore, and Characterize the United States EEZ

Goal 5: Build Public and Private Partnerships to Map, Explore, and Characterize the United States EEZ

Please visit the following link for more information: NOMEC Strategy