

BOEM

Bureau of Ocean Energy
Management

Marine Mineral Priorities in Alaska

Alaska Coastal Mapping Summit
December 9, 2020



BOEM Mission



The Mission of the Bureau of Ocean Energy Management is to manage development of U.S. Outer Continental Shelf energy and mineral resources in an environmentally and economically responsible way.

Marine Minerals Program Mission and Vision

Vision

Serve as the lead agency proactively addressing the Nation's current and long-term interests in OCS non-energy marine minerals.

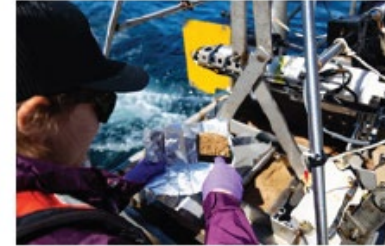
Mission

Facilitate access to and manage the Nation's Outer Continental Shelf (OCS) non-energy marine minerals through environmentally responsible stewardship, prudent exploration and leasing activities, coordination with governmental partners, stakeholder engagement, and mission-focused research to improve decision-making and risk management.

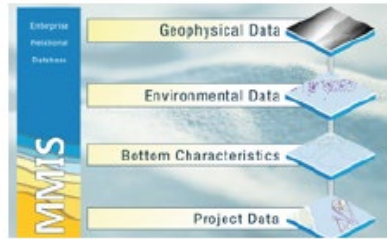
BOEM Marine Minerals Initiatives



National Offshore Sand Inventory



Marine Minerals Research



Marine Minerals Information System



National Offshore Critical Minerals Inventory



Environmental Oversight

Critical Minerals (per U.S. Geological Survey)

BLUE = Occur in marine minerals within the U.S. Exclusive Economic Zone

- Aluminum (bauxite)
- **Antimony**
- Arsenic
- Barite
- Beryllium
- **Bismuth**
- Cesium
- Chromium
- **Cobalt**
- Fluorspar
- **Gallium**
- **Germanium**
- Graphite (natural)
- Hafnium
- Helium
- Indium
- **Lithium**
- **Magnesium**
- **Manganese**
- **Niobium**
- **Platinum group metals**
- Potash
- **Rare earth elements**
- Rhenium
- Rubidium
- **Scandium**
- Strontium
- Tantalum
- **Tellurium**
- **Tin**
- **Titanium**
- Tungsten
- **Uranium**
- **Vanadium**
- **Zirconium**

Main Deposit Types

Manganese Nodules



Source: USGS

Depth: 4,000 to 7,000m

Occurrence: Authigenic precipitate in soft sediments of abyssal plains

Extent: Occur in all ocean basins, most abundant in central Pacific

Growth Rate: 2-10mm / million years

Critical Minerals: Cobalt, manganese, REE, tellurium, platinum, bismuth, niobium, and zirconium

Ferromanganese Crust



Source: USGS

Depth: 600 to 7,000m

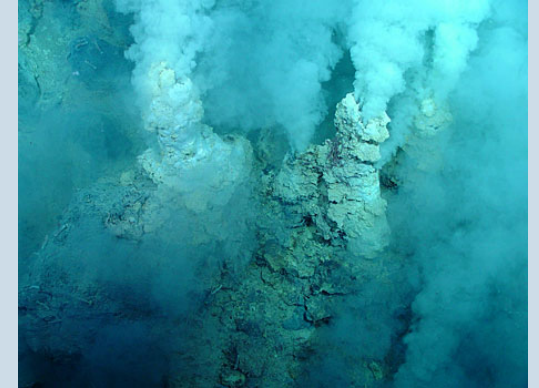
Occurrence: Authigenic precipitate on flank and summit of seamounts

Extent: Central and western Pacific

Growth Rate: 1-4 mm / million years

Critical Minerals: Cobalt, manganese, REE, tellurium, platinum, bismuth, niobium, and zirconium

Seafloor Massive Sulfides



Source: NOAA

Depth: 100 to 7,000m

Occurrence: Precipitate of minerals leached from host rock and magmatic fluid

Extent: Globally along active tectonic boundaries

Growth Rate: variable to \leq cm / day

Critical Minerals: antimony, bismuth, gallium, tellurium, germanium

Main Deposit Types

Phosphorite-rich Crust



Depth: 200-4000m

Occurrence: Comingled with crusts on seamounts, also along continental shelves and slopes

Extent: Atlantic and Pacific Continental Margins

Habitat: Hard surface possibly populated by sponges and corals

Critical Minerals: REE, uranium, phosphorous

Nearshore Placer Deposits



Depth: less than 200m

Occurrence: Continental Margins

Extent: Adjacent to Terrestrial Deposits

Habitat: Soft Sediment (e.g. sand, mud) with burrowing invertebrates and bottom fish

Critical Minerals: Titanium, tin, platinum, gold, silver, and REE

BOEM's Role in Offshore Critical Minerals

- BOEM oversees mineral development on Outer Continental Shelf (OCS)
 - Authority - OCS Lands Act (OCSLA) (43 U.S.C. 1331, *et. seq.*)
 - In process to develop a National Offshore Critical Mineral Inventory
 - As the nation's steward for these resources, BOEM must ensure that the removal of any mineral resource is done in a safe and environmentally sound manner
- Regulations - 30 CFR 580, 581, 582 (Prospecting, Leasing, and Operations on the OCS for Minerals other than Oil, Gas, and Sulfur)
- Lack statutory authority to lease offshore US territories and possessions
- BOEM staff are working to support the NOMECS Mapping Strategy (Sect 2 of 2019 Presidential Memo)

Executive Orders 13817, 13953 – BOEM Responsibilities

The order, “*A Federal Strategy to Ensure Secure and Reliable Supplies of Critical Minerals*,” directed development of an interagency report released in June 2019.

The report’s recommendations task BOEM to assist with:

- Improving the data collection and discoverability of geophysical, geological, topographical, and bathymetrical mapping of the U.S. and associated coastal and ocean territory.
- Providing recommendations to revise regulations and consider proposing legislation to facilitate offshore critical mineral development.
- Enhancing international cooperation related to critical minerals.



Green – minimal critical mineral data exists
Red – no critical mineral data exists

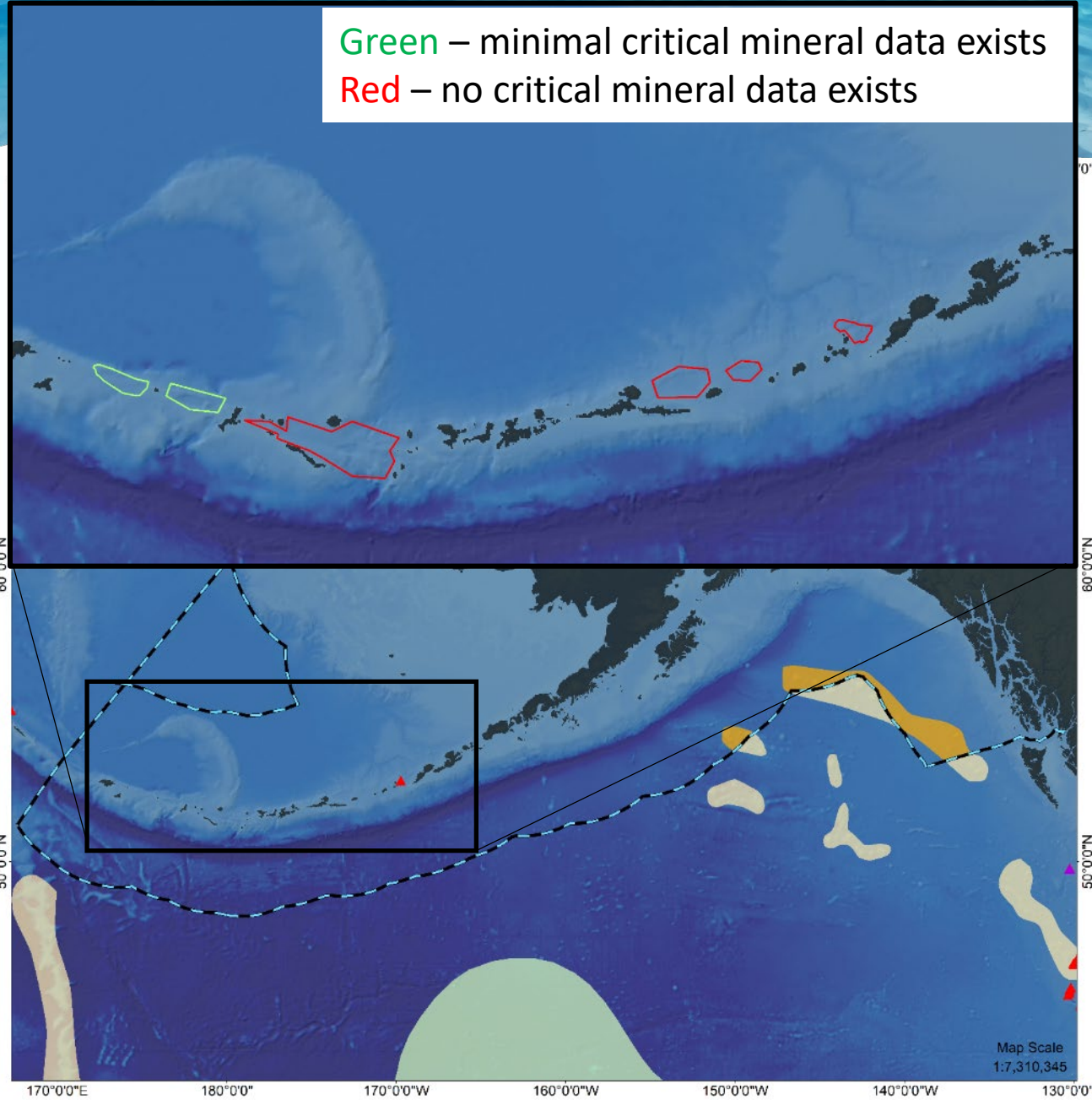
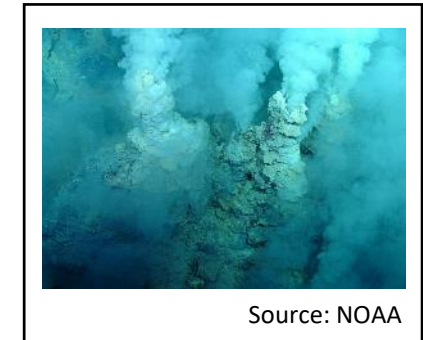
Legend

- Coastline
- US EEZ
- FAS EEZ
- Other EEZ
- ▨ Marine Reserves
- ▲ Active Vent
- ▲ Extinct Vent
- Crust in US EEZ
- Crust not in US EEZ
- Nodules in US EEZ
- Nodules not in US EEZ

The Aleutian Island chain is likely host to multiple hydrothermal sulfide deposits.

This potential is largely unexplored. BOEM funded a desktop study in FY20 to refine the occurrence estimates and assist site selection for follow-up exploration.

Minerals (Bold = Critical):
 Copper, zinc, **antimony, bismuth, gallium, tellurium, scandium,** silver, gold



Resource Estimates from USGS



The background of the image is an underwater scene showing sand dunes on the ocean floor. The water is a deep blue, and the sand is light-colored, creating a rhythmic pattern of ridges and valleys. The lighting is soft, creating a serene and natural atmosphere.

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