

# Offshore Environmental-Resource Exploration for Critical and Hard Offshore Minerals on the Outer Continental Shelf

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## Abstract

The Bureau of Ocean Energy Management (BOEM), part of the United States Department of the Interior, is the steward of critical and hard mineral resources on the U.S. Outer Continental Shelf (OCS). The United States defines critical minerals as minerals essential to U.S. economic and national security, that serve a vital function in manufacturing, and that have supply chains vulnerable to disruption. Approximately half of the designated U.S.-listed critical minerals may occur in offshore deposits. BOEM's Marine Minerals Program, comprised of diverse technical and policy experts, engages in partnerships with federal and state agencies, academic institutions, and other entities to develop and implement multidisciplinary research program to characterize the baseline environment of the U.S. seabed that may contain critical minerals, to analyze the potential effects and impacts of future activities on the chemical, physical, biological, and human environment, and to locate and identify critical minerals. Research projects are underway in the Pacific, Atlantic, and western Aleutian Island regions in 2022, 2023, and 2024. In the Pacific, a research expedition gathered environmental and resource data associated with hydrothermal sulfide deposits found in the Escanaba Trough spreading center offshore northern California. On the U.S. Atlantic shelf, a ship and autonomous underwater vehicle expedition to the Blake Plateau collected further data about the environments of known nodule and crust deposits. The study area has been visited several times since historic test mining in the early 1970s and provides an excellent opportunity to document long-term impacts and the recovery of disturbed seabed. Finally, in the western Aleutian Arc of Alaska, a three-phase research program is: 1) collecting bathymetric and oceanographic data using an autonomous surface vehicle; 2) exploring and sampling specific sites that show evidence of hydrothermal activity; and 3) performing in-depth analytical environmental characterization of selected sites that could contain critical minerals. Initial bathymetry collection in the Aleutians will commence in Summer 2022, with follow-on projects planned in 2024. Newly proposed research in the Gulf of Mexico investigating the association of critical minerals with salt brine deposits may commence in 2023. These projects, all located on the U.S. OCS, are designed to gather data about both mineral resources and associated environments, providing researchers and BOEM analysts with the types of data and information needed for responsible stewardship.