

UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

United States Government Initiatives in the Assessment
and Development of the Mineral Resources of the Exclusive
Economic Zone of the United States

By

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Open-File Report 84-110

Prepared for presentation at the Second International Seminar on
Offshore Mineral Resources - March 19-23, 1984, in Brest, France

This report is preliminary and has not been reviewed for conformity with U.S. Geological Survey editorial standards and stratigraphic nomenclature. Any use of trade names is for descriptive purposes only and does not imply endorsement by the USGS.

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ABSTRACT

The Presidential proclamation of an Exclusive Economic Zone focuses attention on the mineral resources of a vast submarine area. The hard-mineral resources include shallow water placer deposits, polymetallic sulfide deposits and cobalt enriched manganese crusts in deeper water. The distribution of these resources, their geologic setting, and economic potential are being studied.

In order to formulate a national program to assess the resources in the EEZ a symposium on "A National Program for the Assessment and Development of the Mineral Resources of the United States Exclusive Economic Zone", was held at the National Center of the U.S. Geological Survey in Reston, Virginia. Participants in the symposium represented government agencies, academic institutions, and industry. The symposium covered resource evaluation, engineering development needs, and the legal framework for management of the assessment and development of the mineral resources of the vast area of the EEZ. A summary of the preliminary recommendations resulting from the symposium are discussed as well as the initial steps that are taking place in implementing the recommendations and formulating an effective national program.

INTRODUCTION

On March 10, 1983, President of the United States, Ronald Reagan, signed a proclamation establishing the Exclusive Economic Zone (EEZ), an area contiguous to the territorial sea of the United States, the Commonwealth of Puerto Rico, the Commonwealth of the Northern Mariana Islands, and the U.S. overseas territories and possessions (Appendix A). The EEZ area is approximately 1.6 billion hectares (3.9 billion acres). In comparison to the 1 billion hectares of related onshore area, the EEZ proclamation brings within the national domain an enormous new frontier area in which the types of energy and mineral resources present are fairly well known but which are still largely unassessed in terms of the abundance and recoverability. Figure 1 outlines the extent of the EEZ, and figure 2 shows a schematic diagram of the applicable offshore morphology and boundary terminology.

DESCRIPTION AND HISTORY OF THE EEZ

The initial legal basis for U.S. offshore resource jurisdiction was set in President Truman's Proclamation of September 28 1945, which recognized that "the continental shelf may be regarded as an extension of the land-mass of a coastal nation and thus naturally appurtenant to it" (Proclamation No. 2667, 59 Stat. 884). At that time, an offshore depth of 600 feet was considered to be the outer limit of technology for resource exploitation. Subsequently, the U.S.'s Outer Continental Shelf Lands Act of 1953 defined the Outer Continental Shelf as "all submerged lands lying seaward of [state waters] ... which are subject to [United States] jurisdiction and control," without defining the specific seaward boundary of U.S. resource jurisdiction. The 1958 Geneva Convention on the Continental Shelf defined the outer limit as "a depth of 200 metres or beyond that limit

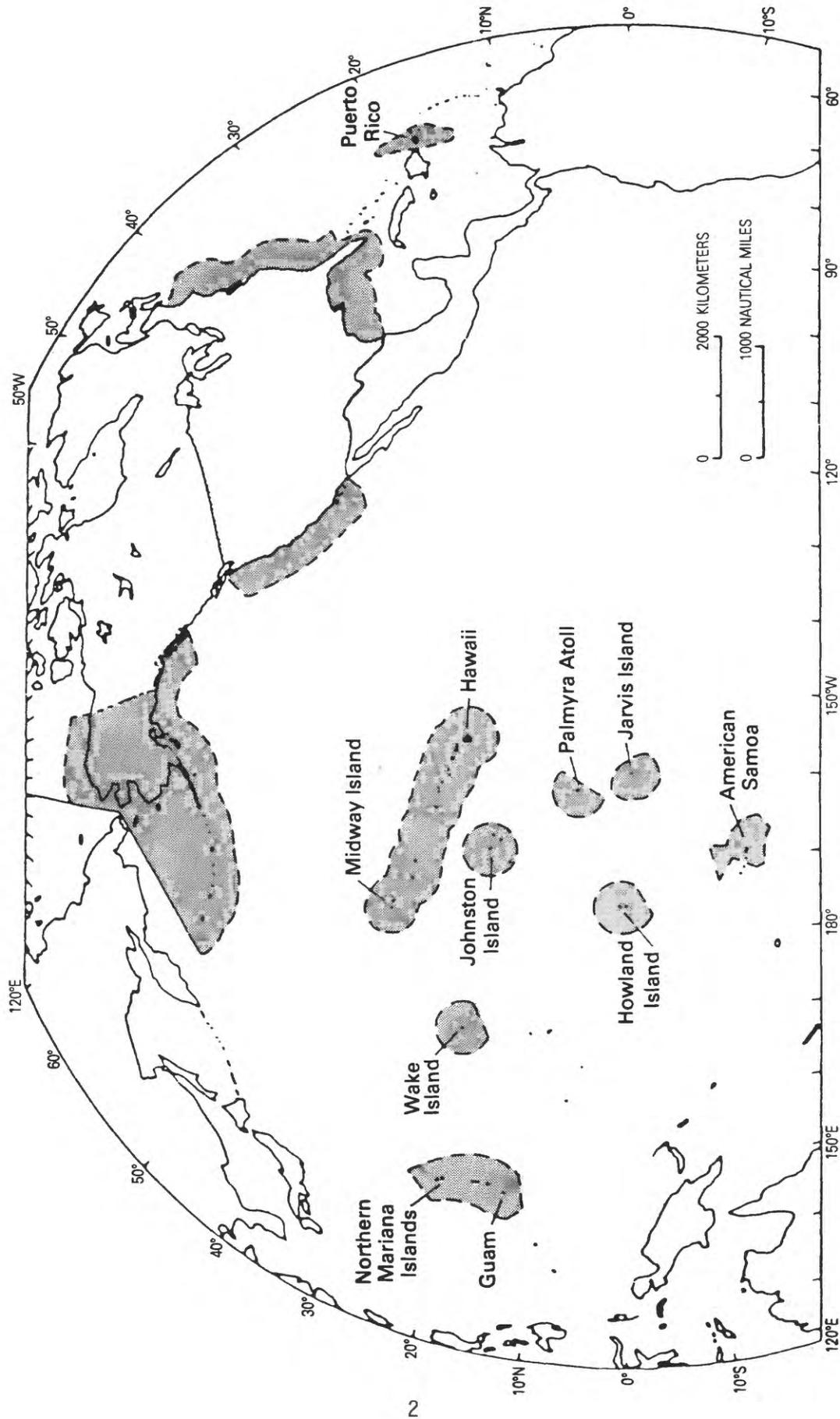


Figure 1 - Exclusive Economic Zone (EEZ) of the United States, Commonwealth of Puerto Rico, Commonwealth of the Northern Mariana Islands, and United States overseas territories and possessions (outlines of map are approximate).

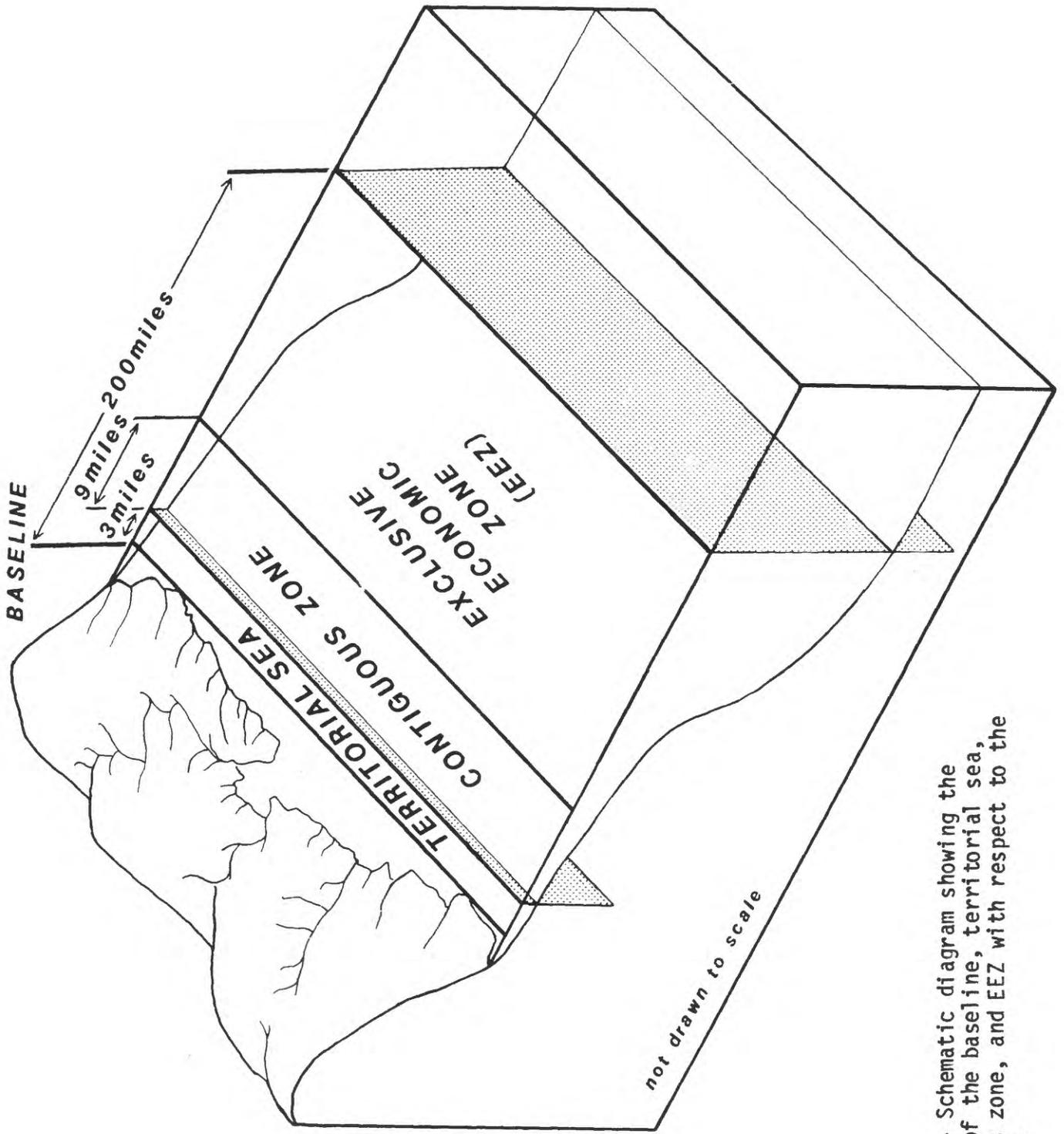


Figure 2 - Schematic diagram showing the location of the baseline, territorial sea, contiguous zone, and EEZ with respect to the coastline.

to where the depth of the superjacent waters admits exploitation of the natural resources." This convention became effective for the U.S. in 1964. Thus the seaward extent of the U.S. has never been clearly defined either in a geologic or in a legal sense, although since 1945 the concept of an extension of the land mass has been in place. The term continental shelf has been used domestically and internationally at the Third United Nations Conference on the Law of the Sea (UNCLOS III) to include continental and insular shelves, slopes, rises, and other features such as continental borderlands. International law also recognizes that the continental shelf usually extends a minimum of 200 nautical miles, regardless of geology.

Relevant in the definition of the OCS outer limit is the fact that in some places the natural geologic prolongation of an undersea land mass can be more than 200 nautical miles from the shoreline. Article 76 of the UNCLOS treaty addressed this issue, and the merits of this article have been widely discussed (See Hedberg 1979, 1983; McKelvey, 1983).

The concept of a national maritime "Exclusive Economic Zone" (EEZ) extending 200 nautical miles from shore was developed during the 10-year course of negotiations at UNCLOS III. Coastal nations would retain rights to living and nonliving resources, but otherwise the region would be treated as high seas. The EEZ concept has become accepted under the customary international law, and over 50 countries have already declared an EEZ. While the United States has not concurred in the 1982 United Nation's Convention on the Law of the Sea (the product of UNCLOS III), the President established the United States EEZ on March 10 of last year in full accord with earlier precedents on continental shelf jurisdiction and international law. (We also note that in many cases the U.S. boundaries with opposite or adjacent states have not yet been finalized).

The March 10th announcement did not specifically designate the geographic coordinates of the outer extent of the EEZ, but a general indication of its extent given by the U.S. fisheries conservation zone, since the operational language of the EEZ proclamation generally follows the language of the Fisheries Conservation and Management Act. An official depiction of these boundaries can be found on the National Ocean Survey's marine boundary charts and maps listed in the National Oceanic and Atmospheric Administrations's "Map and Chart Catalogue 5."

RESOURCE POTENTIAL OF THE EEZ

Major deposits of oil and gas and potentially important deposits of other minerals, including strategic commodities, occur in the EEZ. However, because of the extreme size of the EEZ, resource estimates are based on spotty data coverage requiring extrapolation of findings into unsurveyed and unsampled areas. Future exploration, technological developments, and economic conditions will determine which of these resources will be developable and when. Here, we present a general assessment of the mineral potential of the EEZ (other than oil and gas) as far as present understanding of the environments and processes will allow, and outline techniques for improving this preliminary appraisal. Both the mineral and hydrocarbon resources are discussed in U.S. Geological Survey Circular 912, entitled "The U.S. Exclusive Economic Zone--A Summary

of its Geology, Exploration, and Resource Potential" (Rowland et al., 1983); other publications which may be of interest include Holser et al. (1981), McGregor and Offield (1983), and Edgar (1983).

Although the ocean severely limits the observations a geologist can make of the seabed, it does provide an excellent laboratory for studying ancient as well as modern marine sedimentary or mineral deposits. In addition, observations of active processes of marine deposition and erosion can be directly applicable in understanding our onshore geologic surroundings, and in the search for resources. Conversely, studies of former marine settings, now on land, together with offshore geophysical data and drillhole or surface samples, can provide an understanding of today's sea floor geology--the setting and makeup of the continental shelves, slopes, and rises, as well as the deep ocean floor. It is these studies that have already led to a vastly improved understanding of the processes shaping the Earth and moreover to the discovery of significant resources.

HARD-MINERAL RESOURCES

Nearly all known hard-mineral resources of the U.S. continental margin are located on the continental shelf (fig. 3), owing, in part, simply to the paucity of information on the deeper, slope regions. The two other possibly economic hard-mineral resources located farther offshore but still within the EEZ are polymetallic sulfides and cobalt-rich manganese crusts. Until recent plans for leasing polymetallic sulfides in the Gorda Ridge area (fig. 4) were announced, no hard-minerals leasing in Federal waters had occurred since 1968. [Under U.S. law, state governments exercise jurisdiction over near-shore submerged lands (generally to 3 nautical miles offshore), the Federal government jurisdiction covers regions seaward of this limit.]

Continental Margin Deposits

Near-shore shelf resources usually include sand and gravel, salt, phosphorite, and placer deposits (Manheim and Hess, 1981). Sand and gravel deposits are reasonably well known and have attracted commercial interest where dictated by local need. Salt deposits of the Gulf of Mexico may contain evaporite minerals enriched in potassium, bromine, or other economic commodities. Phosphorite, necessary for agriculture, is known to be present off southern California and the southeast Atlantic margin. Other surveys have revealed the presence of phosphorite and of pavement-like deposits and nodules of manganese covering the Blake Plateau, off the Carolina coast (fig. 3).

Glaciers and rivers disgorge large quantities of sediments onto the continental shelf, including minerals of economic interest. Ocean currents and storm-driven currents rework these sediments, often concentrating mineral deposits as "placers," of titanium, platinum, rare-earth elements, and gold. Several such deposits are known offshore of Alaska, California, Oregon, and Washington, and others are likely buried within the continental margin.

Development of salt and evaporite, phosphorite, and placer deposits is presently not economically feasible, but advanced technologies and increases in prices might make them profitable.

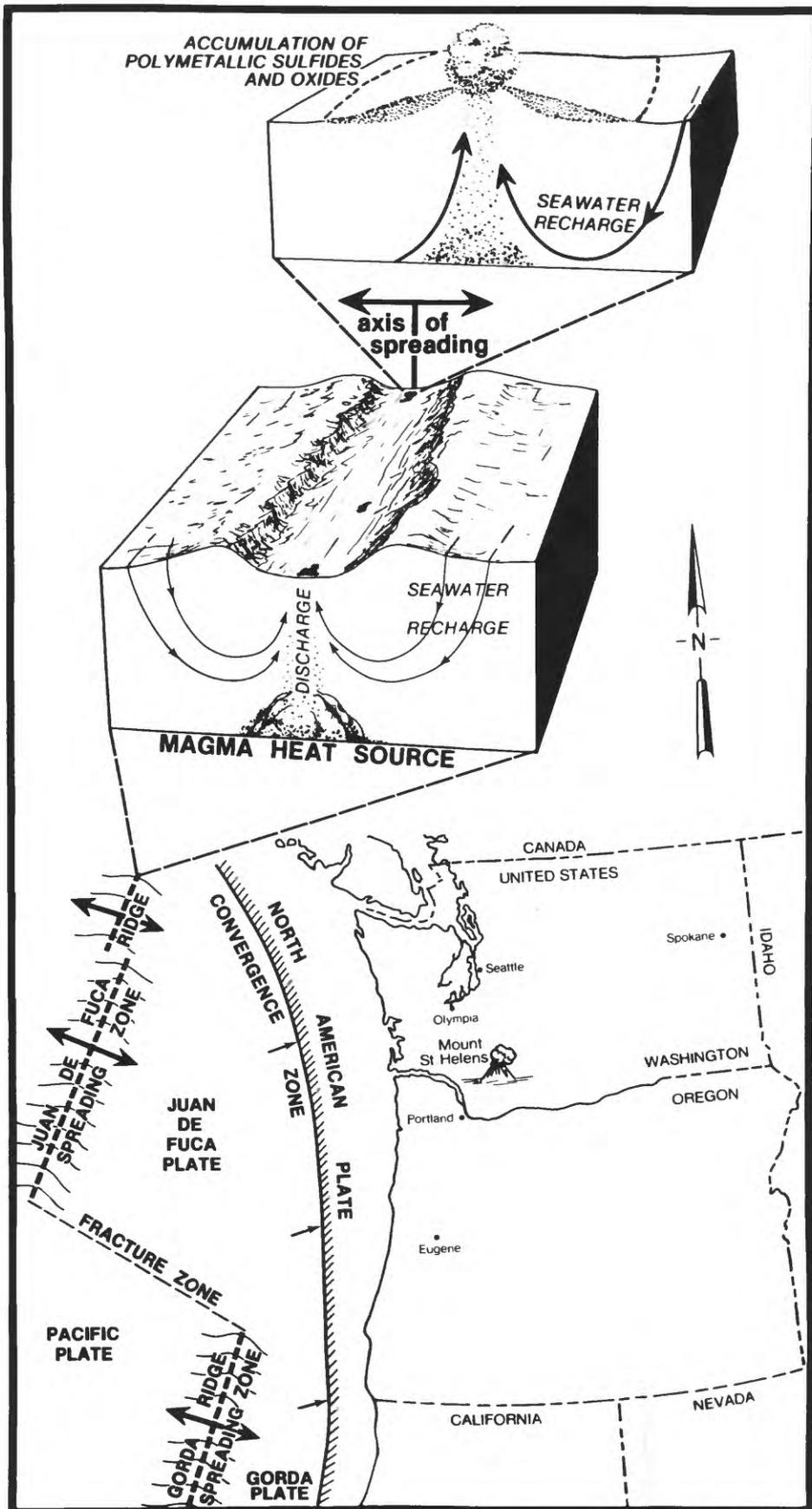


Figure 4 - Polymetallic sulfide deposits form at vents along the axis of a spreading ridge. Location of the Gorda and Juan de Fuca Ridges is shown.

Polymetallic Sulfides

Spreading oceanic rift zones at crustal plate edges are sites where molten rock rises from the Earth's interior and is injected along the axis of the rift (fig. 4). The rock then cools and creates new sea floor. Sea water is believed to percolate deep into cracks near the rift and react with the rocks of the ridge to form mineral-rich hydrothermal solutions that rise to the sea floor, where minerals precipitate as sulfide-rich deposits. They take on a variety of forms, including flows, columnar edifices around vents, encrustations on slopes, and small cones built on sediment (figs. 5, 6). The deposits are relatively rich in zinc, iron, and copper, with lesser quantities of silver, cadmium, molybdenum, lead, vanadium, chromium, barium, strontium, gold, and platinum.

Deposits of polymetallic sulfides were first discovered in the axis of the East Pacific Rise at 21°N. latitude in 1978 (Francheteau and others, 1979). They have since been found along the rift zones and spreading centers, as well as in the axis, of the Juan de Fuca Ridge, off the coast of Washington (fig. 4) this ridge is partly within the U.S. EEZ but also extends northward into waters off Canada. Another active spreading center nearby and closer to shore is the Gorda Ridge, also judged to be a possible location for sulfide deposits. Because spreading-center deposits are considered to be modern counterparts of on-land copper-iron-zinc sulfide ores, they have been compared with U.S. land-based deposits, which suggests that the thickness, continuity, and grade of ore is probably not uniform within, and between, spreading centers. Ore-deposit thicknesses of up to 40 m occur on land, but currently no subsurface coring has been done to assess the thickness of marine mineral deposits. A joint program by the U.S. and Canadian Geological Surveys drilled shallow cores in the Juan de Fuca area in September 1983. Unfortunately, inability to maintain the drill on the sloping surfaces of the sulfide deposits, resulted in recovery of only extremely fresh basalt from the lower relief volcanic rocks around the vents. Void spaces between successive sheet flows also limited sample recovery by the drill. Core, surface, and fluid samples, as well as suspended-sediment samples downcurrent from vents, are expected to be collected in a grid large enough to show spatial variability. This program of surveying, sampling, and analysis will continue to attempt to quantify the resource potential of polymetallic sulfide deposits at this ocean ridge.

While many of the islands in the Pacific are part of an island arc at the edge of a crustal plate, some, such as the Hawaiian Islands, occur within the Pacific plate. They form over what geologists call hot spots, places where plumes of molten rock are rising from deep within the Earth. These plumes are fixed in location, and as the crustal plate of the Pacific moves over them, a line of volcanoes or seamounts--volcanoes that do not reach above the sea surface--is formed. The island of Hawaii today is over a hot spot which is causing volcanic activity. The trend of the chain of islands from Midway to Hawaii shows the northwesterly direction that the Pacific plate is moving. Each island was originally over the hot spot where Hawaii is today. Although no deep basins filled with sediment are associated with this type of island, minerals accumulating on the volcanic edifice may be important. Polymetallic sulfides may be

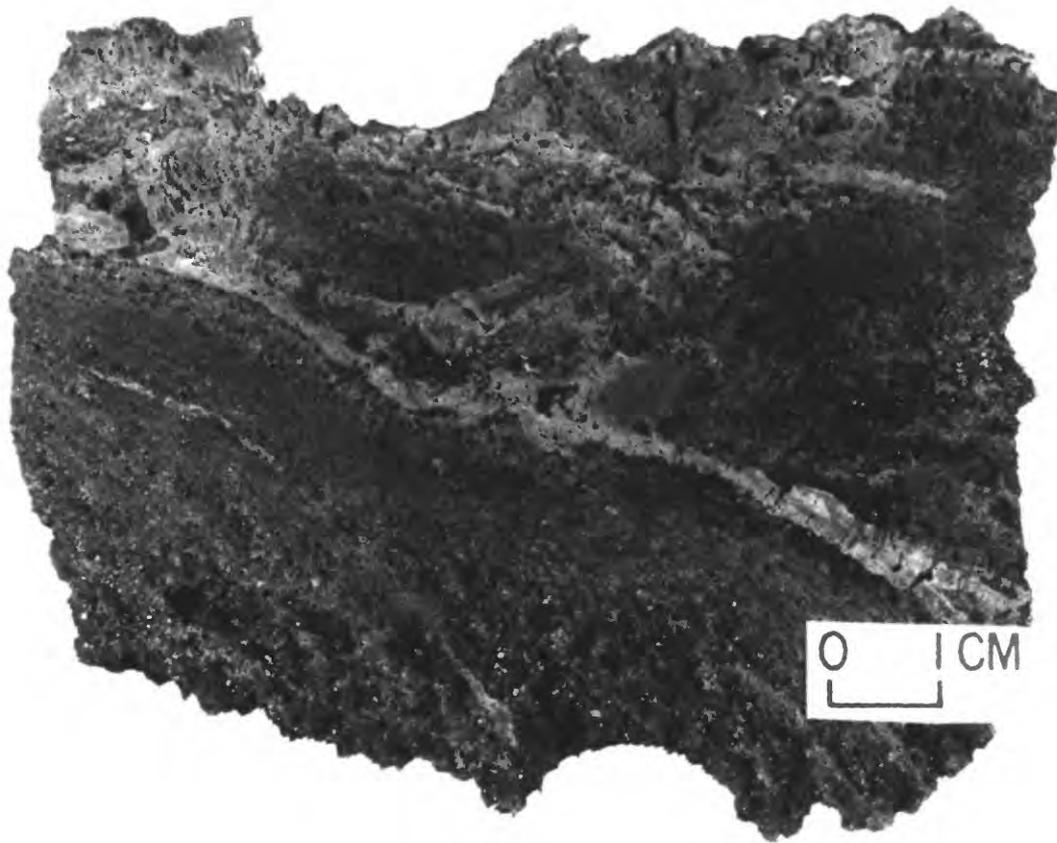


Figure 5 - A sample of hydrothermally deposited zinc sulfide shows light colored layers of iron sulfide (pyrite). (Photograph courtesy of R. A. Koski, USGS.)

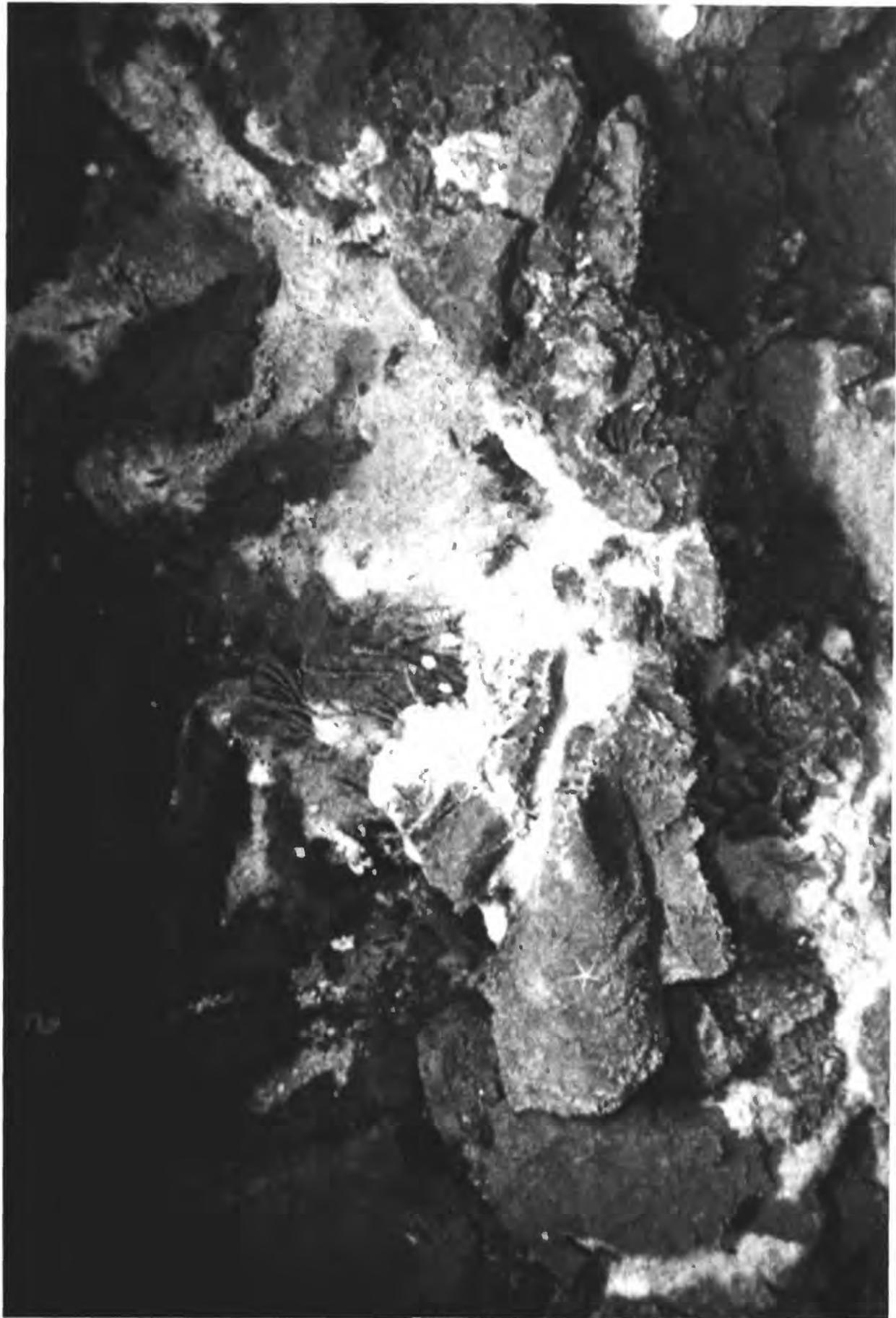


Figure 6 - View of clusters of tube worms and polymetallic sulfide deposits around a hydrothermal vent on the Juan de Fuca Ridge. Field of view is approximately 5 m across. (Photograph courtesy of W. R. Normark, USGS.)

deposited at, or just beneath, the sea floor in the vicinity of the hot spot where volcanic activity is occurring.

Geologists have only just begun to study the geology and resources of these hot spot islands. The underwater flanks of the volcanoes are relatively steep and the water is over 12,000 feet deep in places, which makes their study difficult. Even the very basic question of the particular types of resources and distribution on these islands needs to be answered.

Cobalt-Rich Manganese Crusts and Nodules

Recent work by the U.S. Geological Survey suggests that cobalt-rich manganese crusts occurring on the flanks seamounts and oceanic islands in the central Pacific could represent a significant mineral resource. The crusts appear to average 2 cm in thickness in some areas and are fairly uniformly distributed at depths of 1,000-2,600 m (Geotimes, 1982). They are known to be present on many of the islands in the Pacific, there are over 200 such islands and seamounts within the U.S. EEZ boundaries in the Pacific alone.

The crusts generally contain 1.0 percent or more cobalt, 0.5 percent nickel, and 15-25 percent manganese. However, thin pieces of crust dredged by USGS scientists from a seamount about 160 miles northwest of Palmyra Atoll and Kingman Reef (United States territorial possessions in the central Pacific) had a cobalt concentration of about 2.5 percent, more than twice the concentration that earlier studies had indicated. The rock samples also contained significant quantities of nickel (0.8 percent) and manganese (32 percent). High cobalt values were also found on seamounts northwest of Johnson Island near the Hawaiian Islands. The concentrations of cobalt, nickel, and manganese in the metallic crusts increase southward from Hawaii, and reach a maximum on seamounts just north of the equator. Though the concentrations vary, and much more study is needed, the crusts on some seamounts may represent an economic resource. Crusts at depths shallower and deeper than the 1,000-2,500 m depth zone are generally not as rich in cobalt. A recent cruise by the USGS has indicated that the relationships between metallic crust thickness, seamount type, geological structure, topography, and water depth are more complex than had been thought based on earlier cooperative work with scientists from the Federal Republic of Germany aboard the research vessel Sonne, according to Frank Manheim, Chief Scientist for the USGS cruise. Deep-sea manganese nodules, believed to be forming by processes similar to those which produce the crusts, have a mean cobalt content for high-grade samples in the Pacific of 0.27 percent (McKelvey and others, 1983). The crusts thus apparently contain significantly more cobalt than the nodules, which have received so much attention in recent years. The complex relations becoming apparent for manganese crusts suggest that the economic potential of shallow-water nodules needs to be reevaluated. If the seamounts prove to be covered with the crusts and nodules, a single seamount could yield enough ore for a commercial mining operation. The importance of this is highlighted by the fact that the U.S. depends largely on Africa for its supplies of cobalt.

SYMPOSIUM ON NATIONAL EFFORTS IN THE EEZ RESOURCE ASSESSMENT AND DEVELOPMENT

To aid in organizing a national program for the assessment and development of the mineral resources of the recently proclaimed Exclusive Economic Zone, a symposium was held in Reston, Virginia, at the U.S. Geological Survey National Center, November 15-17, 1983. The three-day symposium was sponsored by the Geological Survey, the Minerals Management Service, and the Bureau of Mines, all in the U.S. Department of the Interior. The EEZ Symposium was held to plan a coordinated government, academic, and industry program to evaluate the mineral-resource potential in this new economic zone. Panel discussions focused on the science of resource assessments, the engineering technology necessary for exploration and development, and the leasing and legal ramifications of managing such potential resources. Approximately 240 people participated in the symposium with 58% of the attendees from government agencies, 25% from private industry, and 17% from academia.

The symposium examined, through invited presentations and workshop groups, the status of current and proposed activities among academic institutions, the private sector, and government agencies involved in evaluating, leasing, exploring, and developing mineral resources of the EEZ; identified future research and data needs and program objectives and priorities of mutual interest to all three sectors; and defined the best course of action by the government, the private sector, and academia in the EEZ to evaluate this vast national domain within a framework of mutual cooperation. Workshop panels on both oil and gas and other mineral resources examined specific aspects of scientific research, engineering, technology and resource management necessary to design a national program for the assessment and development of the mineral resources of the United States Exclusive Economic Zone. We will present only the preliminary recommendations from those three of the six panels which dealt with hard mineral resources. The final recommendations of the panels which addressed hydrocarbon resources, as well as the hard minerals panels, and the conference proceedings are being published in a U.S. Geological Survey circular entitled, "A National Program for the Assessment and Development of the Mineral Resources of the United States Exclusive Economic Zone."

The three symposium panels germane to this meeting are: 1) Science and Resource Evaluation of Hard Minerals, chaired by Robert D. Ballard, Woods Hole Oceanographic Institution, and James L. Bischoff, U.S. Geological Survey; 2) Engineering and Technology Assessment of Hard Minerals, chaired by Donald G. Kesterke, U.S. Bureau of Mines, and Conrad G. Welling, Ocean Minerals Company; and 3) Management and Legal and Leasing Framework for Hard Minerals, chaired by Michael J. Cruickshank, Minerals Management Service, and David P. Stang. The preliminary recommendations of these panels presented by the chairmen at the symposium are summarized in the following sections.

Science and Resource Evaluation Panel Recommendations

The Science Panel on Hard Minerals strongly encouraged the Federal Government to establish a national program to investigate the occurrence

of hard minerals within the Exclusive Economic Zone. The Panel believed that the United States should reduce dependence on other nations for raw materials through the delineation of hard mineral resources within the EEZ, as well as use of that data base to help in the exploration of hard mineral deposits on land.

The Panel noted that the hard mineral deposits presently known within the EEZ are marginal in value given our present data base and world metal prices. This observation, however, must be tempered by the following considerations:

1) In 1960 we were unaware that the mid-ocean ridge was the largest geologic feature on our planet covering 23% of its total surface area.

2) In 1964 we had yet to fully embrace the concepts of plate tectonics which have subsequently revolutionized Earth science.

3) In 1979 we had yet to find the high temperature deposition of massive sulfides on the mid-ocean ridges--let alone the even more recent discoveries of similar deposits in back-arc basins and on seamounts (which have also been found to have cobalt rich crusts).

Even more important is the fact that much of these new insights have come as a result of expeditions which were not seeking to find hard minerals. We openly admit our past and present ignorance and, therefore, encourage accelerated exploration. Although a variety of government agencies are involved in carrying out investigative studies within this newly established region and should be encouraged to continue, we specifically encourage the U.S. Geological Survey, the Minerals Management Service, and the National Oceanic and Atmospheric Administration to develop a coordinated national program aimed at:

1) The generation of topographic and geologic maps of the EEZ through inventorying of existing data bases and carrying out reconnaissance surveys to not only further our understanding of the extent and significance of known hard minerals such as sand and gravel, placers, phosphorite, manganese nodules, cobalt crusts, and massive sulfides, but also other hard-mineral deposits not yet even contemplated in the marine environment. A sense of urgency is placed on the need to generate such maps as soon as possible with emphasis upon their rapid public dissemination. Additional emphasis needs to be placed upon acquiring such maps in the most cost-effective manner possible given the 1.6 billion hectares involved. For that reason, the Panel recommended that industry and academia should be given serious consideration in the production of such maps if their services are more cost-effective.

During this reconnaissance effort, the Panel felt that attention should be given to specific geologic provinces within the EEZ in an effort to identify those hard-mineral assemblages which are associated with each particular geologic setting, and in identifying areas of deficiencies in the data base.

2) The identification of areas of high probability of finding mineral deposits and, within those areas, carry out detailed studies. Care must be taken in these studies to define the criteria to be used to evaluate the deposit. Emphasis, for example, must be placed not only on the bulk analysis of the deposits but the physical setting in which they are found as such settings may affect subsequent exploration and ultimate exploitation.

Although the Panel stopped short of making specific recommendations regarding ultimate assessments of hard minerals within the EEZ at this time given our meager data base, the Panel suggested that the Minerals Management Service (MMS):

1) Insure that the leasing of tracts in the future not preclude parallel scientific investigations in the same areas and,

2) Consider establishing a legal framework similar to the framework now governing exploration in Canadian waters to permit the timely release of data to the public sector without interfering with the companies' proprietary investment.

In addition to these general recommendations, the Science Panel encouraged the MMS to:

1) Review on-going deliberations which inhibit the extraction of known deposits within the EEZ such as sand and gravel and placers and,

2) Clarify the long-term legal framework within all parts of the EEZ, as these legal considerations and their outcome may directly affect the priority given to investment by public and private sources in those regions.

Engineering and Technology Assessment Panel Recommendations

In its deliberations, the Engineering Panel assumed that morphological and geological factors would be addressed by the Science--Resources Assessment Panel. Working from this assumption, the general consensus of the Panel was that:

1) The resource potential of the ocean floor is not known.

2) It is possible, however, with a limited degree of certainty, and by making assumptions as to the physical character of a hypothetical ore body, to engineer mining and materials handling systems which can mine and transport ore to the surface.

3) Once at the surface, the ore can be processed for metal recovery with only minor modifications to current technology.

Based on the above, the Engineering Panel concluded that resource characterization is the area of most pressing need, and that this will require broad reconnaissance tools that define the physical and chemical characteristics of ocean-floor deposits.

The Panel recommended that the national program should include efforts to:

1) Assess the state-of-the-art of methods for resource definition and characterization.

2) Identify specific areas of weakness. For example, coring tools are not available that can provide adequate three-dimensional characteristics of the deposits.

3) Design, build, test, and refine prototype tools necessary for resource potential definition and characterization.

4) Conduct a phased study of the ocean floor consisting of a broad area reconnaissance, followed by detailed study of promising sites that includes characterization work designed to lower the uncertainty level associated with mining and materials handling.

The Panel suggested that the above steps be considered as a two-phase effort consisting of:

1) A near-term phase involving a program to develop new tools while at the same time continuing on-going work using existing tools. (e.g., SEABEAM and Sea MARC systems) This phase should require 3 to 5 years.

2) A long-term phase which will make use of the new tools, and which will require another 5 to 10 years.

Also, the Engineering Panel recognized two basic types of deposits, requiring different types of specialized tools: unconsolidated, typified by alluvial materials, and consolidated, typified by polymetallic sulfides and crustal deposits.

The Panel recommended that the government provide the funds needed to assess the state-of-the-art and to support all basic research required as a precursor to developing the prototype tools. Depending on national need factors, the design and proof-of-concept testing of the tools, and the detailed survey of the ocean floor would be funded solely by the government, or co-funded by industry.

Upon completion of the survey, a go/no-go decision can be reached, and government involvement in terms of direct financial support would cease. If the survey indicates that the resource potential is promising, it would be up to industry to proceed with efforts to build the mining and materials handling equipment.

As a first step in implementation of the program, the Panel recommended that immediate measures be taken to form a small task force to lay out a detailed plan of action. The Panel further recommended that the USGS take the lead, and that the task force members include representatives from industry, academia, as well as other government agencies.

Management and Legal and Leasing Framework Panel Recommendations

Developing a leasing program for hard minerals is complex because there are about 88 different commodities involved, each with unique factors. These commodities can be assigned to five basic groups: 1) Construction materials (e.g. sand and gravel); 2) Placer deposits (e.g. gold, platinum, titanium, tin); 3) Bulk commodities with low value mineral content (e.g. phosphates); 4) Manganese oxides (e.g. nodules and cobalt-enriched manganese crusts); and 5) Metalliferous sulfides (e.g. hydrothermal polymetallic sulfides).

The basic conclusion of the Management Panel was that no great urgency exists to hold a lease sale next year for polymetallic sulfides on the Gorda Ridge. The lack of an adequate data base precludes the assessment of the resource and its value. This conclusion does not apply to the other minerals which may be in greater demand.

New, less expensive exploration tools need to be developed. The present cost of a drill rig to collect samples to adequately assess a resource would exhaust the value of that resource. The third dimension of polymetallic sulfide deposits has yet to be determined and will require drilling or development of new exploration tools.

Another reason for not moving too quickly is economic, a lack of market demand. Although there may be a national defense interest in some commodities, the economic incentives have to come from the marketplace.

Legal aspects of a leasing program will depend on whether existing law is implemented or new legislation is enacted. If the existing law were to be implemented, a bonus bid (payment deferred until after commercial production) and work commitment (minimum work commitment) are recommended. To prevent speculators, it is recommended that leases not be assignable except through merger, and mergers be prohibited if the sole purpose were to acquire the polymetallic sulfide lease. The lease terms should be for 20 years or beyond, so long as the leaseholder is exploring or producing. A flexible regulatory structure is recommended with lease terms and conditions tailored to each offering. Besides establishing leasing terms, it is important that accommodation of other interests be considered (e.g. fisheries, navigation, etc.). General environmental issues must also be addressed. It is recommended that all interested participants (environmentalists, the public, and state and local governments) have input to the draft environmental impact statements.

CONTINUING ACTIONS

The Department of the Interior has formed an intra-departmental task force to review the reports and recommendations of the Symposium's six panels. This task force, composed of: a) bureaus of the Department of the Interior; b) other U.S. Government agencies c) private industrial organizations or d) academic institutions (under government or private funding) has been charged with providing initial ideas and has principal responsibilities for implementing these recommendations. Following this review, it is expected that the Secretary of the Interior will transmit his recommendations

to the concerned agencies and to the Cabinet Council on Natural Resources and the Environment and initiate budget actions as necessary. We all recognize that the intensity of action on these recommendations will be dependent upon the availability of government and private funds, but believe that this coordinated effort will most efficiently provide for early assessment and development of these important resources.

SUMMARY

Although the Exclusive Economic Zone has a high potential for significant recoverable energy and mineral resources, further information is necessary before the extent of that potential can be reliably estimated. Because of the large size of the EEZ, it is essential that government, industry, and academia work together in studying and evaluating the resources as part of a national program. The first step to result from the symposium is that a task force will be set up to insure that the recommendations from the symposium are implemented. As an example of this implementation, the U.S. Geological Survey is seriously studying the feasibility of a drilling program within the EEZ, one of the panels' high priority recommendations. A national program for the EEZ has been initiated and is evolving.

ACKNOWLEDGMENTS

We would like to thank S.B. Griscom and G.D. Hardin for their aid and advice.

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APPENDIX A

THE WHITE HOUSE
Office of the Press Secretary

March 10, 1983

EXCLUSIVE ECONOMIC ZONE OF THE UNITED STATES OF AMERICA

A PROCLAMATION BY THE PRESIDENT OF THE UNITED STATES OF AMERICA

WHEREAS the Government of the United States of America desires to facilitate the wise development and use of the oceans consistent with international law;

WHEREAS international law recognizes that, in a zone beyond its territory and adjacent to its territorial sea, known as the Exclusive Economic Zone, a coastal State may assert certain sovereign rights over natural resources and related jurisdiction; and

WHEREAS the establishment of an Exclusive Economic Zone by the United States will advance the development of ocean resources and promote the protection of the marine environment, while not affecting other lawful uses of the zone, including the freedoms of navigation and overflight, by other States;

NOW, THEREFORE, I, RONALD REAGAN, by the authority vested in me as President of the Constitution and laws of the United States of America, do hereby proclaim the sovereign rights and jurisdiction of the United States of America and confirm also the rights and freedoms of all States within an Exclusive Economic Zone, as described herein.

The Exclusive Economic Zone of the United States is a zone contiguous to the territorial sea, including zones contiguous to the territorial sea of the United States, the Commonwealth of Puerto Rico, the Commonwealth of the Northern Mariana Islands (to the extent consistent with the Covenant and the United Nations Trusteeship Agreement), and United States overseas territories and possessions. The Exclusive Economic Zone extends to a distance 200 nautical miles from the baseline from which the breadth of the territorial sea is measured. In cases where the maritime boundary with a neighboring State remains to be determined, the boundary of the Exclusive Economic Zone shall be determined by the United States and other State concerned in accordance with equitable principles.

Within the Exclusive Economic Zone, the United States has, to the extent permitted by international law, (a) sovereign rights for the purpose of exploring, exploiting, conserving and managing natural resources, both living and non-living, of the seabed and subsoil and the superjacent waters and with regard to other activities for the economic exploitation and exploration of the zone, such as the production of energy from the water, currents and winds; and (b) jurisdiction with regard to the establishment and use of artificial islands, and installations and structures having economic purposes, and the protection and preservation of the marine environment.

The Proclamation does not change existing United States policies concerning the continental shelf, marine mammals and fisheries, including highly migratory species of tuna which are not subject to United States jurisdiction and require international agreements for effective management.

The United States will exercise these sovereign rights and jurisdiction in accordance with the rules of international law.

Without prejudice to the sovereign rights and jurisdiction of the United States, the Exclusive Economic Zone remains an area beyond the territory and territorial sea of the United States in which all States enjoy the high seas freedoms of navigation, overflight, and laying of submarine cables and pipelines, and other internationally lawful uses of the sea.

IN WITNESS WHEREOF, I have hereunto set my hand this tenth day of March, in the year of our Lord nineteen hundred and eighty-three, and of the Independence of the United States of America the two hundred and seventh.

RONALD REAGAN