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The Antarctic Treaty Nations: The Mineral Resources Issue

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A Research Paper

Information available as of 1 June 1981 has been used in the preparation of this report.

This report was prepared by Geographic Research Division, Office of Geographic and Societal Research. Comments and queries are welcome and may be directed to the Chief, USSR-Europe Branch, Geographic Research Division, OGSR

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This report was coordinated with the Offices of Political Analysis, Science and Weapons Research, Economic Research, the National Intelligence Council, the Department of State, and the National Science Foundation.

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The Antarctic Treaty Nations: The Mineral Resources Issue

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Summary

The Eleventh Antarctic Treaty Consultative Meeting is scheduled to begin 23 June 1981 in Buenos Aires to discuss procedure for negotiating a regime to govern the development of antarctic mineral resources.

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Building on tentative discussions at earlier meetings, the 14 Consultative Nations will probably make important advances toward resolving the mineral resources issue. They generally agree that an antarctic mineral resource regime is necessary, although their perceived national interests in the area are diverse.

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Most nations that have territorial claims in Antarctica want to control resource development in their respective areas. A few are willing to forgo exclusive mineral rights in their claim areas in exchange for a share of all antarctic minerals. Because mineral resources have been only superficially explored and no one knows what resources are located where, the claimants are not sure which position is in their national interest.

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Nonclaimants—those that have made no claims and recognize none—generally believe that the continent should be open to all, or, at least, that territorial claims should not be used to exclude interested nations from any area of the continent.

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All antarctic nations, however, wish to protect their investment in Antarctica and are generally resistant to demands for international sharing of the profits derived from the development of antarctic resources. Such demands from Third World nations are muted now but they will certainly become louder if major mineral resources are found.

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Thus, the antarctic nations place some urgency on negotiating a mineral resources regime to prevent problems from arising among them and with other nations as exploration activity expands and as mineral discoveries are made. Meanwhile, the expansion in their antarctic programs and the increasing interest shown by newcomers, such as China, are raising the level of antarctic activity and the complexity of the mineral resource issue.

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Over the last 10 years, the stage for negotiations has been set by discussions on the issue and by the signing in 1980 of an analogous Convention on the Conservation of Antarctic Marine Living Resources. Although the living resources issue was considerably less contentious, its resolution increases chances that the Antarctic nations will be able to resolve the minerals issue in the cooperative international spirit fostered by the Antarctic Treaty.

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Contents

	Page
Summary	iii
Antarctic Treaty (Summary of Basic Provisions)	vi
Introduction	1
The Issue	1
Development of the Mineral Resources Issue	1
The Specific Problems	2
Antarctic Mineral Resources	2
Outlook	3

Appendix

Status and Programs of Antarctic Nations	9
Consultative Nations	11
Argentina	11
Australia	13
Belgium	15
Chile	17
Federal Republic of Germany	19
France	21
Japan	23
New Zealand	25
Norway	27
Poland	29
South Africa	31
Soviet Union	33
United Kingdom	37
United States	39
Acceding Nations	41
Brazil	41
German Democratic Republic	41
Other Acceding Nations	43
Nonacceding Nations	45
China	45
Other Nonacceding Nations	47

The Antarctic Treaty System

The Antarctic Treaty, which was signed in 1959 and entered into force on 23 June 1961, established for at least 30 years a legal framework for the area south of 60° South latitude. It guaranteed that the area would be used exclusively for peaceful purposes and perpetuated the close scientific cooperation that had developed among the 12 nations that established scientific stations in the Antarctic during the 1957-58 International Geophysical Year (IGY). The IGY counterbalanced growing discord among antarctic claimant states, some of which were dangerously close to armed conflict over abstract national rights. The Treaty seized upon the cooperative spirit developed during the IGY as a means of preventing discord and preserving peace in the area.

Summary of Basic Provisions

Article I. *Antarctica shall be used for peaceful purposes only. All military measures, including weapons testing, are prohibited. Military personnel and equipment may be used, however, for scientific purposes.*

Article II. *Freedom of scientific investigation and cooperation shall continue.*

Article III. *Scientific program plans, personnel, observations and results shall be freely exchanged.*

Article IV. *The Treaty does not recognize, dispute, or establish territorial claims. No new claims shall be asserted while the Treaty is in force.*

Article V. *Nuclear explosions and disposal of radioactive wastes are prohibited.*

Article VI. *All land and ice shelves below 60° south latitude are included, but high seas are covered under international law.*

Article VII. *Treaty-State observers have free access—including aerial observation—to any area and may inspect all stations, installations, and equipment. Advance notice of all activities and of the introduction of military personnel must be given.*

Article VIII. *Observers under Article VII and scientific personnel under Article III are under the jurisdiction of their own states.*

Article IX. *Treaty States shall meet periodically to exchange information and take measures to further Treaty objectives, including the preservation and conservation of living resources. These Consultative Meetings shall be open to contracting parties that conduct substantial scientific research in the area.*

Article X. *Treaty States will discourage activities by any country in Antarctica that are contrary to the Treaty.*

Article XI. *Disputes are to be settled peacefully by the Parties concerned or, ultimately, by the International Court of Justice.*

Article XII. *After the expiration of 30 years from the date the Treaty enters into force, any Member State may request a conference to review the operation of the Treaty.*

Article XIII. *The Treaty is subject to ratification by Signatory States and is open for accession by any state that is a member of the UN or is invited by all the member states.*

Article XIV. *The United States is the depository of the Treaty and is responsible for providing certified copies to Signatories and acceding states.*

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The Antarctic Treaty Nations: The Mineral Resources Issue

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Introduction

The emergence of international interest in antarctic resources—a matter not addressed by the Antarctic Treaty—has raised new challenges for the international system established by the Antarctic Treaty. With a changing world resource situation, Antarctica's putative resources are viewed as more than purely scientific curiosities. The Convention on the Conservation of Antarctic Marine Living Resources, concluded in Canberra in May 1980, provided a regime [1] for the conservation of Antarctic marine living resources. The task now is to resolve the mineral resources issue. This is potentially the most troublesome issue that the Antarctic Treaty Consultative Parties have had to face since the Treaty entered into force in June 1961.

The Issue

The Eleventh Antarctic Treaty Consultative Meeting will be held in Buenos Aires from 23 June to 7 July 1981. The main item on the agenda will be the discussion of a regime to govern possible commercial development of antarctic mineral resources. Mounting international interest in the mineral resource potential of Antarctica and the current worldwide concern over depletion of world mineral reserves have caused some of the Consultative Nations to attach urgency to the issue.

Since all of the 14 Consultative Nations [2] generally agree that establishment of an antarctic mineral resources regime is necessary, the specific issues remaining are: who will control resource development and how will the profits gained from such development be shared.

Development of the Mineral Resources Issue. The antarctic mineral resource issue has steadily gained importance among the Consultative Nations since first considered at the Seventh Consultative Meeting held in Wellington, New Zealand, in 1972. At that time, the issue was discussed only within the context of the potential environmental impact of such activity.

At the Eighth Consultative Meeting in 1975, in Oslo, Norway, the parties committed themselves to finding agreed solutions to the antarctic mineral resources issue and to trying to ensure that no mineral resource exploration or exploitation would take place while timely progress was being made toward solution of the issue. The latter commitment is known as the policy of voluntary restraint. The nations also agreed that environmental concerns are an important aspect of the mineral resources issue.

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At the Ninth Consultative Meeting in London in 1977, although priority was given to antarctic marine living resources, significant attention was also devoted to mineral resources. A moratorium on all activity was proposed, during which the possible effects of resource exploitation on the antarctic environment could be further studied and the consideration of a resource management regime could proceed. Australia wanted a five-year moratorium; the Soviet Union favored a 10-year, or even 15-year, moratorium. Most of the other Consultative Nations, however, opposed any moratorium at all. France, New Zealand, and the United Kingdom argued convincingly that a moratorium would merely delay resolution of the issues. In the end, the Consultative Parties reaffirmed the policy of voluntary restraint and endorsed the following principles:

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- The Consultative Parties will continue to play an active and responsible role in dealing with antarctic mineral resource questions.
- The Antarctic Treaty must be maintained in its entirety.
- Protection of the environment should be a basic consideration.

[1] The term regime refers to an agreement on the acceptability of possible mineral resource activities in Antarctica and mechanisms to govern such activities.

[2] The 12 original signatories of the Antarctic Treaty and the two nations that have since become Consultative Treaty Nations.

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- In dealing with the question of antarctic mineral resources, the Consultative Nations should not prejudice the interests of mankind.

The most positive progress thus far was made at the Tenth Consultative Meeting in Washington, D.C., in 1979. The Consultative Nations reached a consensus on the basic objectives of the regime: (1) to determine whether mineral resource activities would be acceptable from an environmental point of view, and (2) to govern any such activities determined acceptable. The results of the meeting are reproduced verbatim on pp. 4-5.

Since the Tenth Consultative Meeting, the Consultative Nations have continued informal discussions on the minerals issue. From these discussions, a general view has emerged among the Consultative Nations that the area to be covered by a regime should include both the Antarctic continent and the continental margin. The regime, it is agreed, should concentrate upon hydrocarbons, though in principle apply to all possible mineral resources. Finally, the parties have generally concurred that the regime should regulate commercial exploration and commercial development. Regulation would involve all activities: the retention of proprietary survey data, drilling for the purpose of locating resources, and the production and transport of the resources.

The Specific Problems. Now that it appears that a mineral resource regime may become a reality, the Consultative Nations have begun making their perceived national interests known, and they are diverse.

Within the Consultative Nations group, differences exist between those that claim antarctic territory and those that do not (stations and claims map). The claimant states want to control resource development in their respective claim areas; the nonclaimants want to share in the benefits from development of the continent.

Even for the claimants the problem is not a simple one. In advocating a regime that recognizes exclusive rights in its claimed zone, the claimant would relinquish rights in zones claimed by others. The alternative for the claimant state would be a regime that denies claims of primacy and specifies shares to all from resources anywhere in Antarctica. Because the nature, location, and extent of antarctic mineral resources are unknown, none of the claimant states has decided which option is in its best national interest.

Most of the nonclaimant states face no such dilemma. Other than the United States and the Soviet Union,[3] the nonclaimants have no basis on which to press claim to antarctic territory and therefore have but one option: to support access for all to the whole continent.

The Antarctic Treaty Consultative Nations want to protect their stake in the Antarctic—an investment that has been costly. They, therefore, are concerned about the demands for wider international involvement in Antarctica. The President of the Third UN Conference on Law of the Sea brought the issue of equitable sharing of Antarctic resources before the UN General Assembly in 1975. A year later, related discussions were held at the Colombo Conference on Nonaligned Nations and at the meetings of the UN Economic and Social Council and the UN Environment Program. Also in 1976, the UN Food and Agriculture Organization drafted a proposal to survey the fishery resources of the oceans south of 45° South latitude. Indications are that the Group of 77 [4] also will seek an equitable share of whatever resources are found in Antarctica.

Antarctic Mineral Resources

Antarctica has been only superficially explored, but it is almost certain that the continent contains mineral resources similar to those of South America, Africa, and Australia—which, together with Antarctica, once formed the super continent called Gondwana. A variety of mineral occurrences has been found in Antarc-

[3] The USSR and the United States have long been the two most powerful opponents of partitioning Antarctica into national sectors. They are also the only nonclaimant states that could reasonably claim portions of the continent by virtue of their early explorations. Decades ago, the claimant states deliberately left a large sector of the continent unclaimed in the hope that the United States would claim it and thereby simultaneously recognize their claims to the rest of the continent. The Antarctic Treaty, however, prohibits any additional claims.

[4] The caucus of developing nations (now numbering 119) at the United Nations.

tica (minerals map). Most of the continent is covered by a sheet of ice up to several kilometers thick, however, and the known location of such occurrences is confined to mountainous outcropping areas that extend above the ice sheet.

So far, only two concentrations of minerals have been discovered that are big enough to be termed deposits: a sedimentary iron ore formation in the Prince Charles Mountains and coalbeds in the Transantarctic Mountains. Neither is economically exploitable, given their quality, the existence of alternative sources in more hospitable parts of the globe, and the difficulties and costs in mining Antarctica. In fact, at present probably no mineral is scarce enough and valuable enough to justify the cost of its extraction from an antarctic minesite.

Interest, therefore, has centered upon the possible hydrocarbon (oil and natural gas) potential of Antarctica. The deposits, if they exist, would likely be located within sedimentary basins of the continental shelf rather than under the continental ice sheet. There are no data upon which to make accurate estimates of Antarctica's hydrocarbon potential, but the possibility of offshore hydrocarbons is inferred from interpretations of geologic history and analogies with other areas of the world. Based on preliminary research, Antarctica's oil reserves are thought to be on the order of tens of billions of barrels. In 1971, Gulf Oil Corporation estimated the petroleum potential under the Ross and Weddell Seas at 50 billion barrels.

If hydrocarbons are to be found and exploited in Antarctica, the most likely areas for offshore activity are the Weddell, Ross, Bellingshausen, and Amundsen Seas. The Japanese have completed one survey and are planning to conduct two additional geophysical surveys in three of these areas over the next several years. Other nations, including the United States, Poland, and the Federal Republic of Germany, have conducted similar, if less extensive, preliminary seismic studies. Should exploration and exploitation occur, drifting ice, deep water, and violent weather would pose tremendous obstacles to offshore drilling, and accidents involving drilling rigs or oil tankers would be very difficult to avoid. Moreover, compensation for environmental degradation from oilspills would cause problems in adjudication. 25X1

Despite the inconclusiveness surrounding antarctic minerals, nearly every country active in Antarctica is tailoring its program planning and execution to reflect an explicit interest in mineral resources. Some Treaty nations have even stepped up their mineral research programs to position themselves more advantageously when the mineral resource issue is resolved. Japan, the Federal Republic of Germany, and the Soviet Union have recently become more active in conducting geologic/scientific surveys of antarctic minerals. 25X1 25X1

Outlook

If the Antarctic Treaty System is to remain strong, it must successfully deal with the growing world interest in mineral resource development in Antarctica, including possible competition for scarce resources should commercial-scale development prove feasible. Building upon the progress made at earlier meetings, important advances most likely will be made at the Eleventh Consultative Meeting toward negotiating a minerals regime. 25X1 25X1

The Consultative Nations' actions over the past two decades justify some confidence in their resourcefulness to reach agreement on the nonliving resource issue. They have demonstrated their dedication to the Antarctic Treaty System in pursuing scientific endeavors and in fostering international cooperation on the continent. 25X1 25X1

The marine living resource issue, although not nearly as contentious as the mineral resource issue portends, was an important test of the Antarctic Treaty System. The Convention on the Conservation of Antarctic Marine Living Resources, when it enters into force, will establish machinery to implement its objectives: a Commission of the Parties, a Secretariat, and the necessary management system prior to the development of commercial-scale harvesting of marine resources. Its potential power to regulate will be particu-

Summary of Tenth Consultative Meeting in Washington, D.C., 1979

X-1. Antarctic Resources—The Question of Mineral Exploration and Exploitation

The Representatives,

***Convinced** of the need to preserve and further strengthen the international regime established in Antarctica by the Antarctic Treaty, which has for nearly two decades guaranteed the use of Antarctica exclusively for peaceful purposes, and in the interest of the development of international cooperation;*

***Aware** of the responsibilities of the Consultative Parties to ensure that any activities in Antarctica, including mineral exploration and exploitation, should they occur, should be consistent with all the principles and purposes of the Antarctic Treaty system, including its objectives that activities in Antarctica should not become the cause of international discord, endanger the unique antarctic environment, or disrupt scientific investigations;*

***Concerned** that unregulated mineral resource activities could significantly harm the fragile antarctic ecosystem;*

***Noting** that the decisions on possible mineral resource activities must take due account of the unique ecological and scientific value of Antarctica and the importance of Antarctica to the world environment;*

***Recognizing** that available information is insufficiently reliable to assess the possible environmental effects of many activities in the area of exploration and exploitation of mineral resources in Antarctica, and conscious of the need for developing such activities in Antarctica and for promoting the development of monitoring programs aimed at detecting the impact of such activities on the antarctic environment should such activities occur;*

***Convinced** that informed decisionmaking on questions of mineral resource activities will usually require the availability of information from such programs;*

***Aware** also of the necessity to obtain additional scientific information with a view to facilitating the development of measures related to the protection of the antarctic environment from possible harmful impacts of mineral resource exploration and exploitation, should such activities occur;*

***Noting** that a meeting of ecological, technological, and other related experts was held in Washington, D.C., June 25-29, 1979, as part of the Preparatory Meeting to the Tenth Consultative Meeting with a view to developing scientific programs aimed at improving predictions of the impact of possible technologies for mineral exploration and exploitation in the Antarctic, and developing measures for the prevention of damage to the environment or for its rehabilitation;*

***Recalling** the provisions of Recommendations VIII-14 and IX-1;*

***Recognizing** the necessity for progress towards the timely adoption of an agreed regime concerning antarctic mineral resources;*

***Recommend** to their Governments that:*

1. They take note of the progress made toward the timely adoption of a regime for antarctic mineral resources at the Tenth Antarctic Treaty Consultative Meeting and related meetings, and of the importance of this progress.

2. They continue consultations proceeding from the provisions of Recommendation IX-1 and from the provisions of the present Recommendation.

To this end they should:

(i) Continue to develop a common understanding of the general purposes of the regime and to identify the specific elements of the regime needed to ensure achievement of those purposes;

(ii) Continue to give thorough examination to all of the elements necessary to ensure that the future regime will achieve its general purposes;

(iii) Hold a meeting before the Eleventh Consultative Meeting, preferably in the first half of 1980, to consider a regime for antarctic mineral resources in its ecological, political, technological, legal, and other aspects; and

(iv) in this regard, make the best possible use of the report of the Tenth Consultative Working Group on Antarctic Resources—The Question of Mineral Exploration and Exploitation: Legal and Political Aspects (which is annexed to the Final Report of the Tenth Consultative Meeting) and of the section of this Final Report which refers to the work of the Working Group on Antarctic Resources—The Question of Mineral Exploration and Exploitation: Scientific and Environmental Aspects.

3. The agreed regime for antarctic mineral resources should be based upon provisions of paragraphs 1, 3, 4, and 5 of Recommendation IX-1 and on such further principles, rules, and arrangements as may be subsequently agreed.

4. An agreed regime on antarctic mineral resources should include ***inter alia*** *means for:*

(i) assessing the possible impact of mineral resource activities on the antarctic environment in order to provide for informed decisionmaking;

(ii) determining whether mineral resource activities will be acceptable;

(iii) governing the ecological, technological political, legal, and economic aspects of those activities in cases where they would be determined acceptable; including:

a) establishing, as an important part of the regime, rules relating to the protection of the antarctic environment; and,

b) requiring that mineral resource activities undertaken pursuant to the regime be undertaken in compliance with such rules.

5. Taking account of the Report of Ecological, Technological, and Other Related Experts on Mineral Exploration and Exploitation in Antarctica (Washington, June 1979), attached as an annex to the Report of the Tenth Consultative Meeting, they facilitate their research activities which would contribute to an improved understanding of relevant aspects of the Antarctic and its environment.

6. With a view of improving predictions of the environmental impacts of activities, events, and technologies associated with mineral resource exploration and exploitation in the Antarctic should such occur, they, though their respective National Antarctic Committees, encourage the Scientific Committee on Antarctic Research to define programs, taking account of the Experts Report (Washington, June 1979), with the objective of:

(a) retrieving and analyzing relevant information from past observations and research programs;

(b) ensuring in relation to the needs for information identified by the Experts Report, the effective use is made of existing programs;

(c) identifying and developing new programs that should have priority, taking account of the length of time required for results to become available.

7. Insofar as is feasible they support, as appropriate, their respective National Antarctic Committees and the offices administering their antarctic research programs in developments arising from the previous paragraph.

8. The subject "Antarctic Resources—The Question of Mineral Exploration and Exploitation" be placed on the Agenda of the Eleventh Antarctic Treaty Consultative Meeting.

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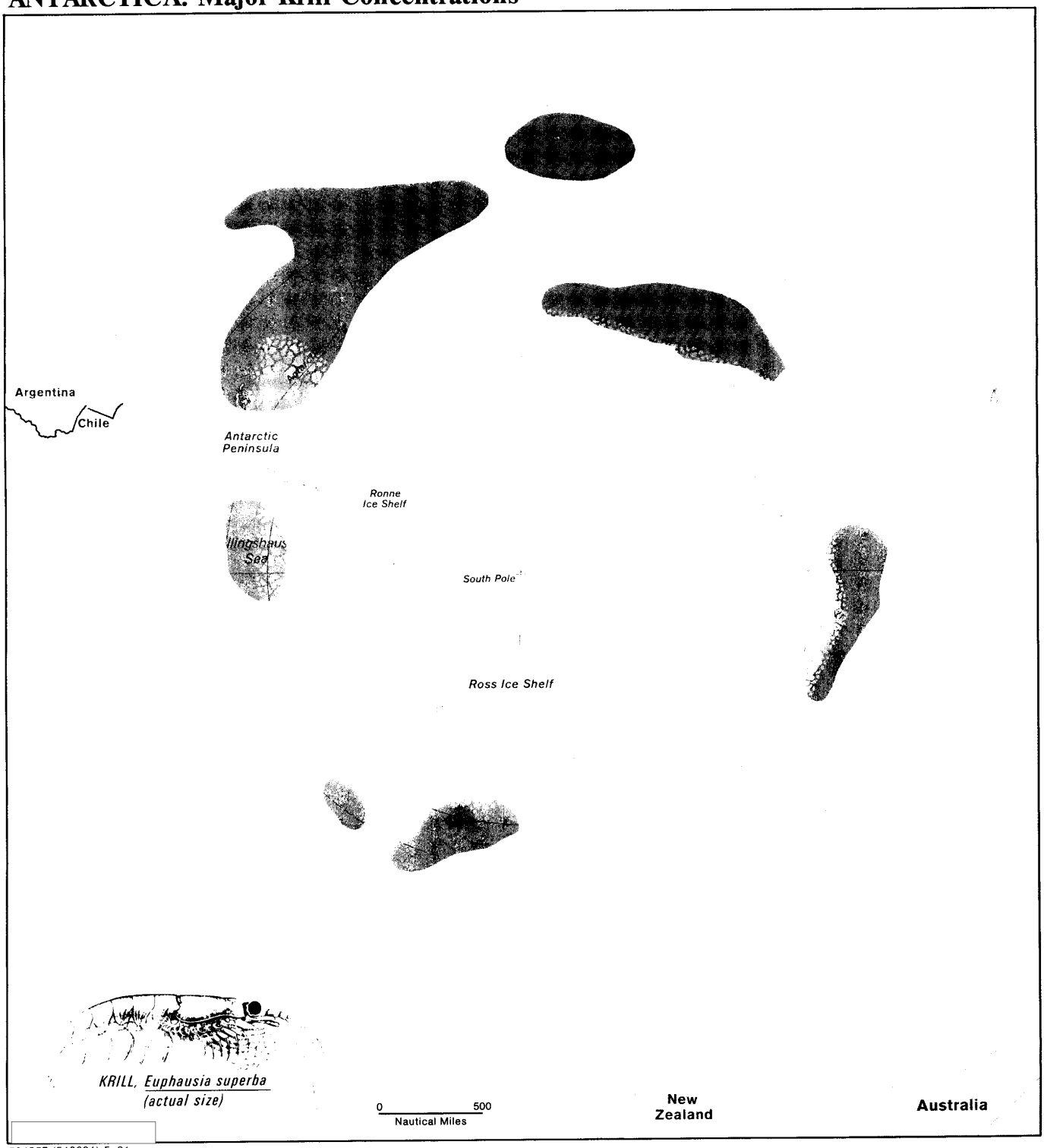
ANTARCTICA: Major Krill Concentrations



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larly important should a krill industry develop. Krill, a shrimplike crustacean about 5 centimeters long, abounds in certain areas of the southern ocean area. 25X1

Having successfully concluded agreement on the marine resource issue, the Consultative Nations generally feel that the slate is now clear to discuss the mineral resources issue. To devise a successful Antarctic mineral resources regime, these nations will have to strive for:

- A system consistent with, or at least nonprejudicial to, the basic legal and political positions of claimant and nonclaimant states.
- A system for defining and applying acceptable environmental standards.
- A system for providing the information necessary for making informed decisions about antarctic mineral resources.
- A system for adequate resource management.
- A system for enforcement. 25X1

Appended is a brief description of the Antarctic position, with a summary of recent trends in the antarctic programs, of each of the present and potential Treaty signatories. 25X1

Antarctic Treaty Signatories

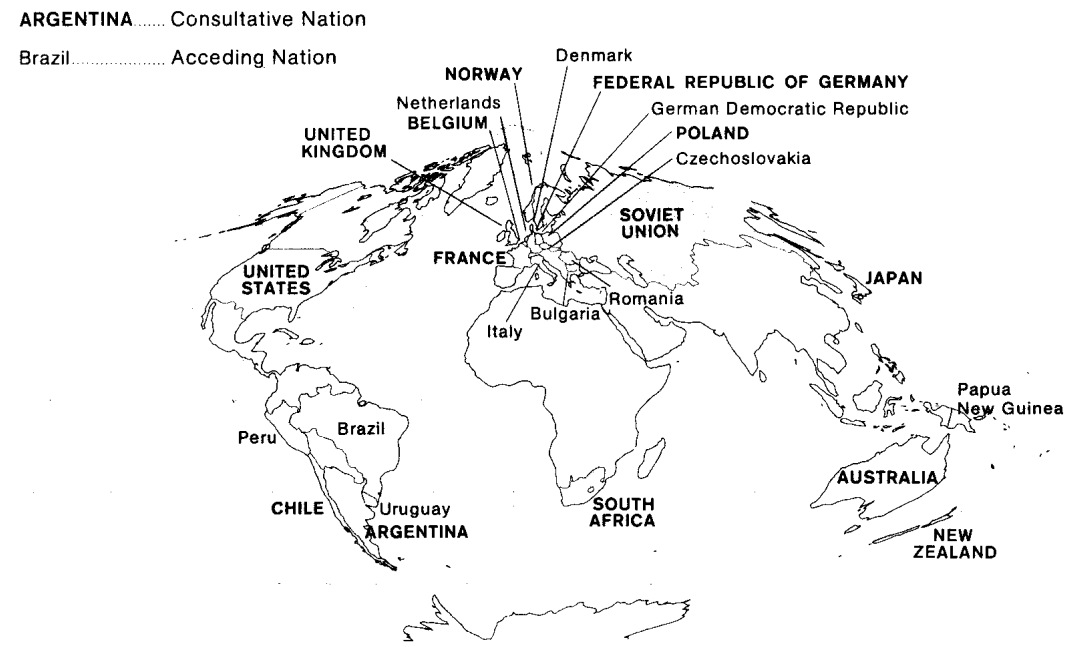

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Table 1

Antarctic Treaty Consultative Nations[1]

Claimant Nations[2]	Nonclaimant Nations[3]
Argentina	Belgium
Australia	Fed. Rep. of Germany
Chile	Japan
France	Poland
New Zealand	South Africa
Norway	Soviet Union
United Kingdom	United States

[1]Poland and the Federal Republic of Germany became Consultative Nations in 1977 and 1981, respectively. The other nations were original Antarctic Treaty Signatories.
[2]These nations claim portions of Antarctica as national territory. Some of the claims overlap.
[3]These nations have made no claims to Antarctic territory (although the United States and the Soviet Union have reserved the right to do so) and do not recognize the claims of the others. No other nations have asserted any Antarctic claims.

Table 2

Antarctic Treaty Acceding Nations

Brazil (1975)[1]	Netherlands (1967)
Bulgaria (1978)	Papua New Guinea (1981)
Czechoslovakia (1962)	Peru (1981)
Denmark (1965)	Romania (1971)
German Dem. Rep. (1974)	Uruguay (1980)
Italy (1981)	

[1]Year of accession

Appendix:

Status and Programs of Antarctic Nations

Until July 1977, when the consultative status of Poland was recognized, the Consultative Nations group consisted of only the 12 original signatories of the Treaty. Each is entitled to participate in the Consultative Meetings. The Federal Republic of Germany became the Fourteenth Consultative Party in March 1981. 25X1

The extent of activities of the Consultative Nations in Antarctica varies; and, except for Belgium and Norway, each maintains at least one year-round station. Argentina, with eight permanent stations, and the USSR, with seven, maintain the most; the United Kingdom and the United States each have four. In terms of cost and effort, the United States and the Soviet Union have the largest antarctic operations, with Argentina a distant third. The Federal Republic of Germany, the newest consultative member, has entered the antarctic arena with a flurry of activity and commitment. While the size of antarctic activities of a number of Consultative Parties has changed little in recent years, the programs of the USSR and Argentina have steadily expanded. The increased efforts of Australia, Chile, and the Federal Republic of Germany have also been noteworthy. 25X1

To date, 11 other nations have acceded to the Treaty, thereby formally agreeing to abide by its principles in any antarctic endeavors. Of these, the German Democratic Republic and Brazil may be preparing to mount antarctic programs, which will make them eligible for consultative status. 25X1

Among the nonacceding nations, China, Taiwan, and South Korea have expressed interest in antarctic matters; the latter two are interested in fishing in antarctic waters. China also indicates some interest in mounting an antarctic program and may soon accede to the Treaty. 25X1

Consultative Nations

Argentina

Antarctic Position

In the early 1970s, during resource discussions among the Consultative Parties, Argentina took the position that the Treaty prohibited mineral exploitation. In more recent years, responding to growing national interest in the potential mineral wealth of the national claim and fearing a UN attempt to control development, Argentina has called for an agreement on mineral resource activities that would combine (1) exclusive authority for the signatories, as a group, to control antarctic mining, and (2) special regulatory authority for each party in its own national claim.

For a while, Argentina supported a five-year moratorium on antarctic resource exploitation but now opposes it. The Argentines view the impending involvement of the international community as a serious threat to their stake in Antarctica. To establish an acceptable resource regime within the framework of the Treaty, Argentina sought a leadership role among the 14 Consultative Parties, and it played a key role in the 1980 Marine Living Resources negotiations.

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At the 1980 Preparatory Session for the Eleventh Consultative Meeting, Argentina indicated it was prepared to enter into negotiations regarding the minerals issue. The Argentines realize that the legal basis of the regime must be internationally acceptable to outsiders, particularly the Group of 77. The Third World wants to share in the riches of the Antarctic, and the Argentines seem prepared to share the untapped re-

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Vicecomodoro Marambio, Argentina's most important antarctic station, is located on an island on the Weddell Sea side of the Antarctic Peninsula. Argentine meteorological data collected in Antarctica is funneled through Marambio to Buenos Aires. During the peak austral summer as many as 100 personnel may serve here.

sources. They, nevertheless, are unrelenting in their position that access to decisionmaking should be through the Antarctic Treaty and that claimant states should (1) maintain a privileged position, (2) have power of consent for any operations in their area, and (3) maintain some authority in monitoring those operations and enforcing regulations.

Argentina strongly defends its antarctic claim. It asserts jurisdiction not only over its claimed sector of land but also over the territorial sea and continental shelf. It had declared a 200-mile territorial zone around its antarctic claim (and around its mainland territory) prior to the conclusion of the Antarctic Treaty. The Argentines assert that a minerals regime should apply to both the antarctic continent and to the continental shelf.

The Argentine Government demonstrates its sovereignty in Antarctica by holding marriages in its claim area, by arranging for babies to be born there, and by setting up schools for their children. It levies taxes on antarctic tourists and requests passports be stamped when entering or leaving Esperanza, the main tourist station. It has also established an extensive network of navigation aids and channel markers on the coast of its claim area.

Perhaps more than any other signatory, Argentina is likely to abrogate the Treaty if its primacy in its claim area is threatened. For example, if another country began a significant unilateral exploration or exploitation effort in the Argentina claim, Argentina might well react with military force even though the Treaty forbids it. All but one of Argentina's permanent stations are run by the military.

Research Program

Spurred by a domestic deficiency in metallic minerals, Argentina has begun geologic study of Antarctica. In 1976, Argentina's National Antarctic Board and its Mining Secretariat signed a three-year agreement to fund antarctic geological studies under the mining promotion law. The country also maintains a biological research program designed to assess the fishery potential of the southern ocean area.

Unlike some Treaty nations, such as Australia and New Zealand, Argentina has little immediate need for antarctic petroleum resources. It already produces 90 percent of its petroleum requirements and plans self-sufficiency in the 1980s. It has 2.5 billion barrels of proven onshore reserves, and recent studies indicate an even greater potential offshore in areas far more accessible than Antarctica. 25X1 25X1

Argentina maintains more Antarctic stations than any other antarctic nation. In addition to operating five stations during the summer months, it recently established its eighth year-round station in Antarctica. All Argentine stations are within its claimed territory; the majority of them are on the Antarctic Peninsula across the Drake Strait from Tierra del Fuego—the country's southernmost territory. 25X1 25X1

Since 1973, Argentina has steadily increased its presence in Antarctica. In 1979, more than 150 people (including 10 spouses and children) wintered over, and the winter-over contingent probably rose to about 180 persons during the 1981 season. The summer augmentation of about 120 persons is principally represented by civilian researchers from the Argentine Antarctic Institute and some 20 other government and nongovernment institutions engaged in the austral summer research effort. A total of about 900 people, including at-home support, participate in the Argentine antarctic program. 25X1 25X1

Argentina's antarctic activities are supported by seven vessels, including three recently added ships: the transport vessel Bahia Paraiso, the research ship Dr. Eduardo Holmberg, and the icebreaker/supply ship Almirante Irizar. Equipped for marine research, the Almirante Irizar was purchased from Finland at a cost of US $65 million. 25X1 25X1

At least eight aircraft augment Argentine antarctic logistics. Air Force C-130s are used to transport personnel and cargo the 1,350 kilometers between Rio Gallegos, Argentina, and the Vicecomodoro Marambio Station. Marambio, Argentina's largest base, is one of only four antarctic stations capable of handling wheeled aircraft. Further improvement of Marambio's airfield has been pending for a number of years. 25X1 25X1

Australia

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Antarctic Position

Although the Australians reveal a sense of urgency in their pursuit of a regime that includes the exploration and exploitation of mineral resources, they view the minerals issue as an integral part of the environmental protection issue. Thus, should minerals operations be initiated, they would want them monitored continuously. Regulation of the activity should include adequate provisions for modifying or halting the operations if necessary.

In resource negotiations, Australia has sought a leadership role among the Southern Hemisphere claimant nations. Australia favors some sort of joint-signatory control of mineral resources development, but it wants maximum authority in its claim. The Australians assert that claimants must be distinguished in a regime to have greater rights than nonclaimants.

During negotiations in 1975, the Australians would not agree to any statement supportive of nondiscriminatory access to resources.

At the March 1977 Preparatory Session for the Ninth Consultative Meeting, the Australian delegation emphasized that the country's position as a territorial claimant must be accommodated in any resource regime; and, more recently, a government spokesman reiterated that Australia would maintain its claim. At the Ninth Consultative Meeting, Australia supported a five-year moratorium on mineral exploitation, pending examination of environmental consequences and progress toward devising a mutually acceptable resources regime.

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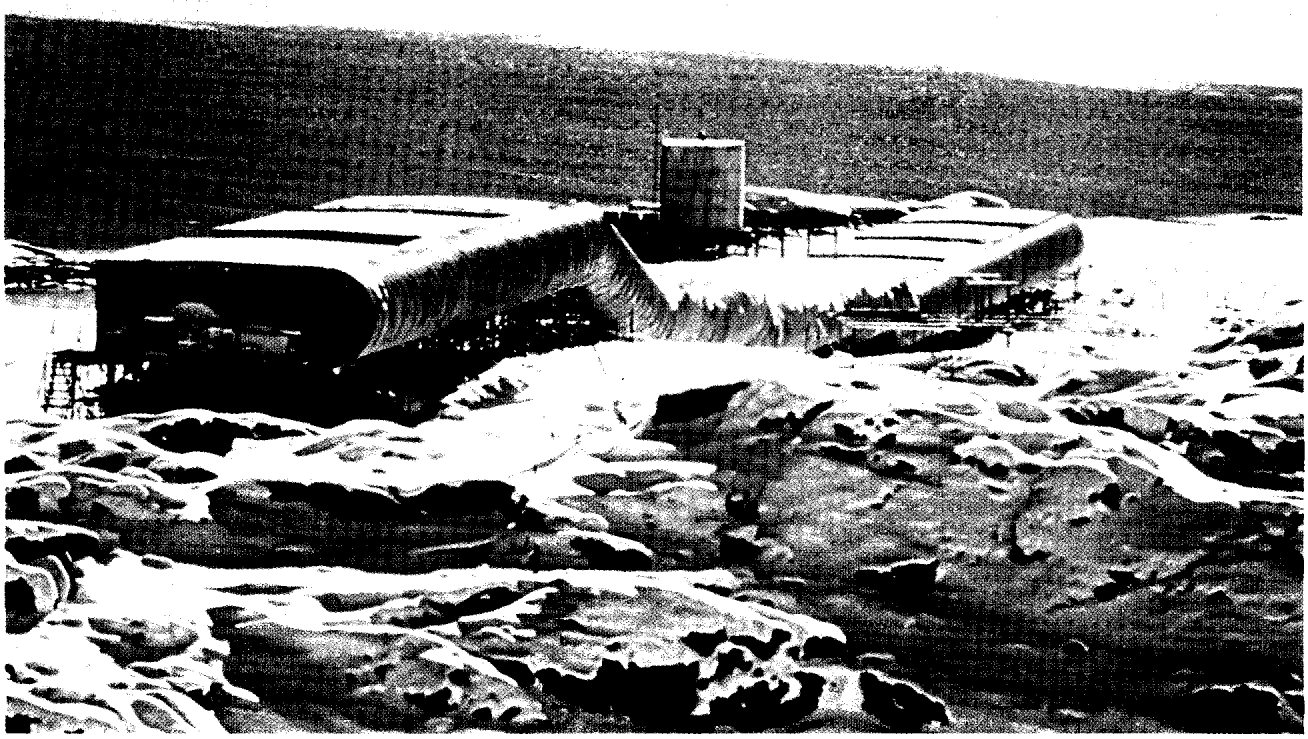
Casey is one of three Australian stations, all located in the larger of the two Australian claim areas. The main station complex is aerodynamically designed, consisting of a row of 11 buildings separated to minimize fire hazard, but connected by a convex passageway. The corridor allows passage between the living and the work areas in severe weather.



Research Program

Geological field work has been the major element in Australia's research program for many years. Geological and geophysical reconnaissance surveys have been completed over most of the major outcropping rock areas in the Australian claim. Published geological reports, however, seldom note any findings of (or even interest in) economically exploitable minerals. For most of the last 20 years, Australia has maintained three research stations in the larger portion of its two claimed antarctic territories. Comparatively, the scope of its land-based program is about equal to that of the United Kingdom, which makes Australian efforts considerably less ambitious than those of the United States, the USSR, or Argentina.

Up to now, economic interests have received a low priority in the Australian antarctic program. The Australians have not conducted any significant research on living resources, nor have they engaged in commercial whaling or fishing in the area. Their strong interest in Antarctica, however, prompted increasing attention to the marine living resources issue. Australia's successful bid for the post of secretary to the Convention on the Conservation of Antarctic Marine Living Resources and its lead in ratifying the Convention reflect these interests. The Antarctic Division of the Department of Science and the Environment, which directs Australia's antarctic program, is in the process of transferring its operations to Hobart, Tasmania. The Australians want to make Hobart the center of international antarctic marine research.

Australia's antarctic program suffers from a poor logistical capability. The Australians have neither icebreakers nor specialized polar research vessels, which limits their marine research efforts. The three vessels employed in their antarctic program—the Nanok S, the Nella Dan, and the Thala Dan—are privately owned and chartered by the government. The Australians also lack ski-equipped heavy aircraft, and their landing strips are unsuitable for intercontinental wheeled aircraft. For the past three years, in exchange for LC-130 (skied) service between Australia's Casey Station and the US McMurdo Station, the Royal Australian Air Force's "Operation Snowflake" has supported the US effort by providing wheeled C-130 service between Christchurch, New Zealand, and McMurdo. Plans call for a new airfield at Australia's Davis Station to permit direct flights from Australia to the Antarctic. 25X1 25X1 25X1

During the past several years officials of the Australian Government have lobbied for the expansion of the country's antarctic program. Recently, the director of the Antarctic Division of the Federal Department of Science and Technology reemphasized that Australia must increase its presence in Antarctica because its sovereignty over the region would be measured by the size and quality of its scientific research program. Following extensive debate in 1978, the government issued a white paper that adopted a more active antarctic policy. Since then, the government has increased its antarctic budget by almost US $10 million, from $6.6 million to $16.5 million. In 1980, it announced that Australia will spend US $55 million over the next 10 years to rebuild its antarctic bases, but there are no plans for a station in its smaller claim. The rebuilding is expected to be completed by the 1989-90 season. 25X1 25X1

Belgium

The Belgians, although not an influential force during antarctic negotiations, are nonetheless fairly active participants. At the December 1980 Meeting on Antarctic Mineral Resources, Belgium outlined these concerns: the protection of the antarctic environment, the inclusion of the mainland and continental shelf in a mineral regime, the inclusion of all resources in the regime, and a reservation over the inclusion of non-Treaty nations in any regime. 25X1

Belgium shows little interest in antarctic scientific research or in the continent's mineral or marine living resources. It became an original Treaty member on the basis of its participation in the 1957-58 International Geophysical Year. During the 1960s, it conducted joint expeditions with the Netherlands and South Africa. 25X1

The Belgian delegate to a recent international polar meeting revealed that, considering the high costs, his country is not likely to mount its own antarctic program but might again be interested in collaborating with other Treaty nations on a cost-sharing basis. Belgium is firmly committed to the Antarctic Treaty and will support any reasonable resource proposals; it holds that the Treaty must be preserved even at the sacrifice of mineral exploitation. Should the European Communities (EC) get involved in antarctic affairs, Belgium would probably support an EC consensus position. 25X1

Chile

Antarctic Position

Chile's antarctic resource policy closely parallels that of Argentina. In a shift from its earlier position that mineral resource exploitation is prohibited by the Antarctic Treaty, Chile is now willing to accept a regime on minerals. Chilean policy, however, calls for resource exploitation to take place within the framework of the Treaty. In other words, Chile rejects UN or Third World involvement in the process of negotiating the resource regime.

At the 1980 Preparatory Session of the Eleventh Consultative Meeting, Chile indicated that it wanted a regime negotiated by the Consultative Nations, and any exploited minerals should flow only to those states associated with the regime. In addition, antarctic claimant states should be accorded special status in a regime. This position is consistent with Chile's 1976 proposal for a dual-licensing system in which both the provisions of the regime and the claimant-nation's national mining laws would apply when mining is conducted in a national-claim area. 25X1

The Chileans want a mineral regime established as soon as possible. Although the regime should be all-encompassing, Chilean observers want hydrocarbon matters dealt with first; the other minerals can follow later. Regarding hydrocarbons, the Chileans deem it important that the difference between scientific research and commercial exploitation be determined and defined. 25X1 25X1

Although Chile and Argentina are at odds in other arenas—especially involving the jurisdiction of the Beagle Channel—and although their claims overlap,

Teniente Rodolfo Marsh Martin, formerly known as Presidente Frei, is located immediately adjacent to Bellingshausen Station (USSR) on King George Island, off the tip of the Antarctic Peninsula. Comprising only three buildings, the station functions as the Chilean Antarctic Meteorological Center. Other than meteorology, only incidental scientific activities are carried out here. 25X1

each has agreed to support the other's positions on resource issues. In fact, at the Ninth Consultative Meeting, in an obvious attempt to strengthen this cooperation, Argentine representatives suggested that the two countries establish a joint base on the Antarctic Peninsula, presumably in the region where the claims overlap. But the Chileans, who bring to antarctic affairs a determination to prevent Argentina from assuming an undisputed leadership role in Latin affairs, are unlikely to cooperate and instead will endeavor to check Argentine dominance in the mineral resource negotiations. The two countries, however, share concern over Brazil's overtures into Antarctica, and, the fact that, Brazil has designated an antarctic zone of interest.

The Chilean Government has consistently maintained that its claimed antarctic territory is an integral part of its national territory and is unlikely to accept internationalization of the continent. Indeed, the director of the Military Geographic Institute announced in 1980 that the Institute's next task will be the mapping of the Antarctic as an assertion of Chilean sovereignty in Antarctica.

Research Program

Chile has consistently increased its activity in Antarctica to strengthen its sovereignty claims, to support its search for natural resources, and to parry continued Argentine buildup in the area. Chile maintains three year-round research stations in Antarctica, all are within its claimed territory in the Antarctic Peninsula area.

In 1977, the Chilean Government indicated that it would strengthen its antarctic program and allocated an additional US $3-5 million for improvement of Chilean stations. Improvements have been made to Teniente Rodolfo Marsh Martin Base (which includes the Presidente Frei meteorological center) in the South Shetland Islands, including construction of an Air Force wheeled-aircraft landing field capable of handling C-130s. This airfield, Chile's first in Antarctica, will facilitate the flow of supplies from Punta Arenas, some 1,075 kilometers away. In addition, an Air Force skiway has been reported under construction on the plateau near Presidente Gabriel Gonzalez Videla Base. After 16 years of inactivity, this summer-only station, which marks the deepest penetration into the Antarctic Peninsula, is being reactivated. The skiway ostensibly will be a jumping off point for flights into the interior, including to the South Pole. In line with these improvements, the Chileans also are reportedly seeking purchase of an icebreaker. 25X1

As a follow up on the Chilean 1972-76 Five-Year Plan, which called for the compilation of an inventory of the mineral resources in the Chilean antarctic claim, the government has published a report on the presence there of certain minerals. Although Chile is already the world's largest exporter of copper, it is seeking additional deposits in Antarctica for future exploitation. During the 1980-81 season, the Chileans carried out a photographic survey of parts of the O'Higgins Peninsula, in their claim area, while in search of mineral deposits. Nevertheless, Chile continues to rank behind Argentina and the United Kingdom in the amount of geological work conducted in the Antarctic Peninsula area. Chile is also interested in the potential economic benefits of using southern Chile as a logistics base for antarctic petroleum development. A recent Chilean report indicates that geologists from the Chilean Antarctic Institute have found evidence of unspecified amounts of petroleum near their O'Higgins Station. 25X1

25X1

Compared to Argentina, the other Latin Treaty State, Chile has probably engaged in more living resource research in the Antarctic and has more experience in krill fishing. The Chilean Institute of Fisheries Development conducted a highly successful pilot krill fishery in 1975 and is experimenting with various krill-processing techniques. In early 1981, Chile, Argentina, and seven other Treaty nations participated in the First International BIOMASS [5] Experiment (FIBEX) project, a 40-day joint krill-research program; the Chileans provided the oceanographic ship, Itzumi, plus a team of 20 scientists and government specialists. 25X1

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In another international involvement, Chilean and Chinese officials in 1978 and 1979 held a series of discussions in which they agreed to set up a joint commission to conduct oceanographic and climatological studies as well as research on resources in Antarctica. The agreement calls for Chinese scientists to work at Chilean stations in Antarctica. Although this agreement apparently is still valid, Chinese scientists seem to be working more closely with Australia and, to a lesser extent, New Zealand. 25X1

[5] Biological Investigation of Marine Antarctic Systems and Stocks.

25X1

Federal Republic of Germany

Inactive in the Antarctic for years, the Federal Republic of Germany (FRG) in 1975-76 and again in 1977-78 sent fisheries research expeditions to antarctic waters to study krill catching and processing methods. This surge in West German interest in the Antarctic was forecast by a statement made in 1978 by the Minister of Research and Technology, who cited Antarctica as the world's most important reserve of unexploited raw materials and stressed that West Germany must participate in its development.

Since then, the FRG commitment to its antarctic program has increased considerably. The US $180 million allocation for the period ending in 1983 is second only to the US budget. Budgeted items include construction of a $20 million research station, a $93 million polar research/supply ship to be launched in 1982, and a 45-man scientific polar research institute, which opened in January 1981 at a cost of $20 million. The institute's annual operating budget is estimated at $15 million.

In 1979 the FRG acceded to the Antarctic Treaty, and in 1981 it was recognized as a Consultative member. Some feared that the USSR would block FRG efforts to gain Consultative status and would hold out for concurrent approval of the German Democratic Republic, but this never materialized. The FRG sought the support of the United States, Japan, Argentina, and others in their quest for acceptance as a Consultative member. When FRG plans for establishing a research station on the Ronne Ice Shelf during the 1980-81 season proved unfeasible because of ice conditions, an alternate site was chosen, with Norwegian Government concurrence, at Atka Ice Port in the Norwegian claim area. The Argentines hurriedly inspected the Georg von Neumayer Station on the eve of the Preparatory Session for the Eleventh Consultative Meeting. This action was taken because the Argentines were the hosts of this meeting and they wanted the proceedings to go smoothly.

The FRG has shown considerable interest in geologic exploration. The German Antarctic North Victoria Land Expedition 1979—the first West German expedition in 40 years—conducted a geological/geophysical survey in North Victoria Land. During the 1979-80 season, the MS Explora conducted seismic studies in the Ross Sea. Similar studies were carried out in the Ross and Bellingshausen Seas during the 1980-81 season. Through these efforts, the FRG obtained 48-channel seismic reflection data on 6,700 kilometers of traverses in the Ross Sea. (The data are being made available to the US Geological Survey for interpretation.) The FRG also plans geologic and geophysical exploration in the Pensacola and Ellsworth Mountains. Plans for the 1981-82 season include an expedition to North Victoria Land, supported by a ship and four helicopters. Reportedly, the FRG had to rule out purchasing an LC-130 for use in the Antarctic because of costs, but may seek US C-130 aircraft support for the Ellsworth Mountains operations.

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It appears that mineral exploration, especially for uranium, will be the focus of West German activity in Antarctica. West German scientists are currently participating in a systematic uranium resource evaluation of Antarctica. The project was initiated in 1976 by the United States and is scheduled to continue through 1982. To date, no substantial concentrations of uranium have been detected, but concentrations of thorium minerals have been found.

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France

Antarctic Position

The French do not consider their claim area an important economic zone, nor are they assertive in their position as a claimant state. Nevertheless, viewing it critical to the Antarctic Treaty System, the French want a minerals regime. Although they have not clearly defined their position on a mineral resources regime, they seek one that generally relates to all minerals, but specifically to hydrocarbons. The French do not seem currently interested in exploiting antarctic mineral resources themselves, but then they do not believe that the Antarctic will be a supplier of hydrocarbons for many years.

During earlier negotiations France firmly supported Treaty signatories having authority to regulate all mineral resource activity south of the 60° South latitude. It favored joint approval by all the Consultative Parties of applications for mining rights, including any from an international seabed authority that a new Law of the Sea Treaty might establish. After having called in 1972 for a 10- to 15-year mining moratorium, France now advocates an early resolution of the minerals question.

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A French spokesman indicated in 1975 that, if it would help the Consultative Parties reach agreement, France would put its territorial claim in abeyance and support access to the whole continent for all on an equal basis. During the 1976 Preparatory Meeting, however, France shifted from that position, indicating that it would prefer a regime setting aside some special, as yet undefined, role for each antarctic claimant in its national area.

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The French conduct a wide range of scientific research at Dumont d'Urville, including meteorology, upper atmospheric physics, geophysics, glaciology, and biology.

Apparently, the French are more concerned with commercial exploitation of marine and mineral resources on the continental shelves of their sub-Antarctic-island possessions than with the Antarctic resources. In 1972, the state-controlled oil company, Societe National Elf Aquitaine, applied for a license to carry out preliminary prospecting for hydrocarbons in the sedimentary basin off the Kerguelen shelf; the application is still pending. The naval supply and scientific research vessel Marion Dufresne will conduct surveys southeast of Reunion Island, in the subantarctic area, to evaluate the economic worth of concentrations of seabed mineral nodules. 25X1

Research Program

France operates only one year-round station, Dumont d'Urville, within its claimed antarctic territory. French scientists based there have been active in glaciological studies on the interior icecap but have conducted little research in the offshore zone. Most French scientific work takes place outside the Treaty area on the French islands of Kerguelen and Crozet. 25X1

Japan

Antarctic Position

Until the Ninth Consultative Meeting, Japan favored delaying exploitation of antarctic nonliving resources until more complete information on the nature of antarctic hydrocarbon and mineral resources became available. Now contending that a mineral resources regime is required, it no longer supports a moratorium on mineral exploitation and exploration. In 1979, the Japanese decided to concentrate on offshore antarctic hydrocarbon exploration.

The Japanese have also shifted their position on internationalizing Antarctica. In 1973, Japan favored making Antarctica a UN trust territory for the benefit of all mankind, with special consideration for developing nations. Since then, it has strongly supported Treaty authority over commercial development and has accorded priority to living resources. Tokyo opposes the establishment in Antarctica of national territorial seas and economic zones that would in effect curtail its fishing activities. 25X1

Research Program

Resource-poor Japan will be in the forefront in assessing the potential of antarctic resources. It needs the living resources to replace the portion of its global fish catch it is losing by the growing number of national 200-mile coastal fishing zones, and the mineral resources to supply its industries. Until recently, Japan had focused primarily upon marine living resources in Antarctica, sharing leadership with the USSR in commercial whaling, fishing, and krill catching. 25X1 25X1

In recent years the Japanese have stepped up exploratory fishing activity in the southern ocean area and are likely to continue this expansion. During the 1977-78 season, the Japanese sent two fishing fleets into the

Syowa is the largest of the two Japanese stations, both of which are in the Norwegian claim area. 25X1

area, including some 16 trawlers—more than three times the number sent the previous year. From December 1980 to February 1981, two oceanographic research ships, the 2,359-ton krill research vessel Kaiyo Maru and the Umitaka Maru, participated in the First International BIOMASS Experiment project. The main task in the research project is an acoustical survey of antarctic krill. The Japanese are reliably reported to have operated 11 krill trawlers, in addition to the two krill-research vessels, in antarctic waters during the 1980-81 season. Their total catch was estimated at 40,000 tons and valued at $25 million.

The 20th Japanese Antarctic Research Expedition (JARE) in 1978 was the first to include a minerals exploration component. During the 21st JARE, geologists surveyed the Yamato and Belgica Mountains and the ice-free areas along the Prince Olav coast. Geological research continued in 1980 during the 22nd JARE, when the ice-free areas in the inland mountains and along the coast were surveyed.

In late December 1980, the Japanese embarked upon a three-year geological and geophysical survey of the southern ocean area. The first stage of the survey involved tests made by the research vessel Hakurei Maru in the Bellingshausen Sea off western Antarctica. The work included: onboard gravimeter and magnetometer surveys, a 12-channel reflection seismic survey, sonobouy refraction surveys, piston coring with heat flow measurement, and dredging. The vessel surveyed more than 3,000 kilometers of traverses, in water depths ranging between 400 and 5,500 meters. Dr. Yasufumi Ishiwada, Executive Director of the Japanese National Oil Corporation and chief scientist aboard the Hakurei Maru, indicated that the survey area contained little petroleum potential.

Reportedly, the survey cost $2.6 million. The funds came from taxes levied on oil imports into Japan with the condition that the money be used exclusively for oil surveys. The expedition was organized by the Technology Research Center of the Japanese National Oil Corporation, a semiofficial body that had been commissioned to undertake the survey for the Agency of Natural Resources and Energy, a division of the Ministry of International Trade and Industry. Similar geophysical studies are planned in the Weddell Sea (1981) and Ross Sea (1982).

Some Treaty nations, such as Australia and New Zealand, are skeptical that the Japanese will fully share all data derived from their seismic studies. The Japanese, anticipating this lack of trust, have endeavored to make public their hydrocarbon prospecting program to allay apprehension of those who envision a Japanese plot to secretly develop data on antarctic resources.

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Japan maintains two antarctic research stations: Syowa, a coastal station of moderate size; and Mizuho, a small station in the interior. In 1976, the Japanese Ministry of Education, the body that supervises antarctic research, recommended the following programs:

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- Promotion of basic research for resource development.
- Promotion of basic research development.
- Establishment of additional bases and observation stations.
- Improvement of logistics support, including construction of a new icebreaker.

25X1

- Creation of a new organization, if required, to handle antarctic resource development.

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Some of these recommendations are being implemented. The keel of a new icebreaker was laid in March 1981; the ship will enter antarctic service during the summer of 1983. The new icebreaker will have a displacement of 11,647 tons, compared to the 7,760-ton displacement of the Fuji, Japan's only antarctic icebreaker. At this time, the Japanese have no plans for additional facilities, and plan to continue their antarctic research program within the current organizational framework.

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New Zealand

Antarctic Position

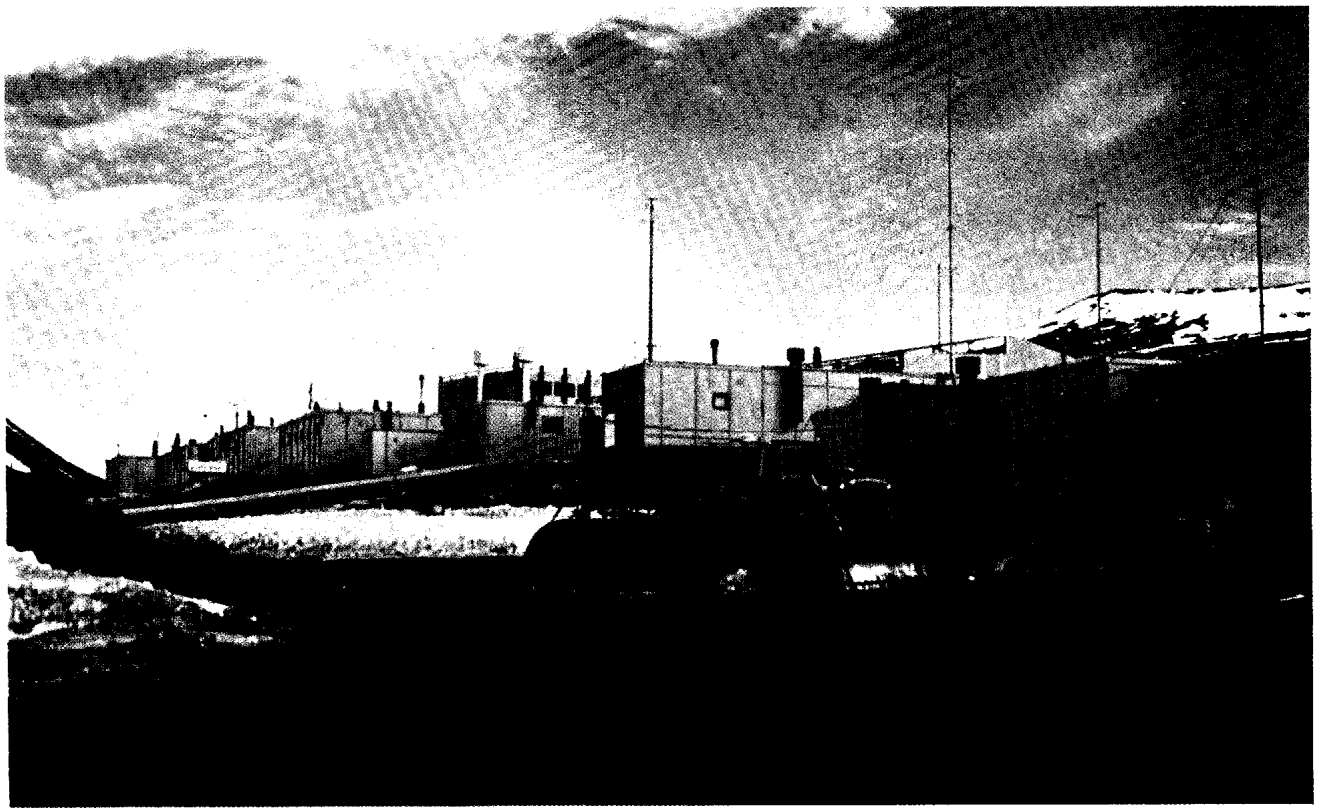
As one of the signatories located nearest Antarctica, New Zealand is mainly interested in preserving the viability of the Antarctic Treaty, especially the provisions that call for demilitarization of the continent and protection of the antarctic environment and ecosystems. It has been more vocal than most other countries in expressing a desire to derive economic benefit from investments made in Antarctica over the years; its primary interest is in offshore hydrocarbons. Consequently, although New Zealand wants to extend the provisions of the Treaty to encompass all possible resource exploitation, it wants hydrocarbons emphasized.

Taking the position that exploitation of antarctic resources is inevitable, New Zealand opposes a moratorium on resource-related activities in Antarctica. In its view, a moratorium would merely delay resolution of the disagreements among Treaty parties concerning regulation of such activities. Instead, New Zealand is pushing for an early establishment of a formal, binding resource regime. 25X1

Because it lacks resources to exploit unilaterally any mineral or hydrocarbon deposits found in the Ross Dependency (a term used by New Zealand), New Zealand had been willing to trade its rights as a claimant state for a guaranteed share of the profits from resource exploitation anywhere in Antarctica. 25X1
The share could have been in the form of taxes, royalties, or license fees, or, in the case of petroleum, a share of the oil. At the 1975 Preparatory Session for the

25X1

Scott Base, located on Ross Island about three kilometers from the US McMurdo Station, is New Zealand's main base in the Antarctic. It was built to accommodate about 20 personnel, but the number may swell to more than 50 people during the peak austral summer period. New construction to alleviate overcrowding and to provide additional space for scientific experiments is almost complete. The construction will increase the size of the base by 50 percent.



Ninth Consultative Meeting, however, the New Zealand delegation instead spoke of preserving a special role for the claimant states in any arrangement signatories might establish for resource exploitation. This does not necessarily reflect a change in New Zealand's basic attitude, but rather a realization that the other claimant states would not follow a New Zealand lead and relinquish their claims. 25X1

New Zealand, however, is somewhat in a quandry. On one side are the groups pressuring to develop antarctic resources, and on the other side are the obstructionist, who take the view that the Antarctic must be internationalized for mankind. 25X1

Research Program

New Zealand maintains one permanent base, Scott, and one summer station, Vanda, in the Ross Dependency, its claim area. Field programs conducted from these stations include geologic, glaciologic, biologic, geophysical, and topographic surveys. 25X1

New Zealand and the United States work closely in their antarctic endeavors. Scott Base is heavily dependent for support on nearby McMurdo, and during the peak of the summer season New Zealand C-130s fly supplies to McMurdo. This air lifeline from New Zealand enables the United States to carry on its substantial antarctic program despite the great distance between the United States and Antarctica. 25X1

New Zealand intends to expand its activities in the Ross Dependency, especially in the offshore area, to include mineral and petroleum resources exploration. During the summer of 1979-80, seeking data useful for assessing petroleum potential, New Zealand deployed an ice-based drilling rig to obtain core samples of the sediments in McMurdo Sound. Plans call for New Zealand, in cooperation with Australia and the United States, to make a geologic expedition to North Victoria Land in 1981. Earlier expeditions to this region have identified a possible belt of copper and zinc ores. 25X1

Norway

Antarctic Position

Because Norway is self-sufficient in petroleum and will have large surpluses in the 1980s, it has no immediate need for Antarctica's potential hydrocarbon resources. Domestic mining interests, however, have sought permission to begin exploration in the Norwegian claim area. Perhaps to forestall any complications arising from such unregulated activity, the Norwegian Government was among the first to urge Treaty nations to adopt some mechanism for regulating resource exploitation. The Norwegians oppose any formal moratorium on resource activity, feeling it would merely delay resolution of the issues.

While Norway is a claimant state it does not always act like one. Maintaining the integrity of the Treaty and the control Treaty nations now enjoy over all antarctic endeavors are of greater importance to Norway than maintaining its sovereignty over its own claim. Nevertheless, the Norwegians seem willing to grant the United Nations some limited role in regulating the exploitation of antarctic offshore resources. For example, in 1974, they proposed to let an LOS Treaty determine whether the Antarctic Treaty mineral jurisdiction should cover the entire Treaty area or extend only to the edge of the antarctic continental shelf. They also, at a March 1977 meeting of Treaty nations, opposed efforts of some to exclude the UN Food and Agricultural Organization from participating in discussions of marine living resources. Furthermore, they have taken an internationalist position in seeking an acceptable accommodation for the Group of 77. Nonetheless, Norway intends to maintain its claim and to demand special consideration for claimant nations in any negotiations for an antarctic resource regime.

At the 1980 Preparatory Session for the Eleventh Consultative Meeting the Norwegians took the view that the mineral regime should have broad application, but that hydrocarbons should be emphasized. In the area of offshore hydrocarbon resource development, Norway could offer its extensive North Sea experience. 25X1

Research Program

Norway is the least active of the claimant states. It mounted no independent expeditions between 1960 and 1976, but during the 1976-77 season it conducted surveys off the Norwegian claim area and established two temporary research stations along the coast. A second seaborne expedition in 1978-79 completed a variety of geophysical and oceanographic surveys—including 3,000 kilometers of seismic, gravimetric, and magnetometric readings. This expedition involved 40 scientists and reportedly cost about $1.2 million. 25X1 25X1

In keeping with Norway's small antarctic research program, scientists from the Norwegian Polar Institute participated in a joint iceberg research project during the 1980-81 season. The project was a continuation of the iceberg research program started by the 1978-79 Norwegian Antarctic Research Expedition. Currently, Norway does not have an active program on marine living resources but is participating in the First International BIOMASS Experiment. 25X1

25X1

Poland

Poland's policy on mineral resources has not been clearly defined. Indeed, to date the Poles have expressed no interest in mineral resource exploration. They, however, indicated at the 1980 Consultative Preparatory Session that Poland is interested in seeing an antarctic regime that would include all minerals.

Poland's resource-related research has focused on marine living resources, especially krill. The Poles, operating from several trawlers in the Scotia Sea, have been conducting an experimental krill fishery since 1957. During the 1980-81 season, Poland's Academy of Sciences and Marine Fisheries Institute launched a joint expedition as part of the First International BIOMASS Experiment project. A similar expedition is planned for the 1982-83 season.

The Soviet Union welcomes the presence of a fellow Communist state on the continent and has been extremely helpful to Poland in establishing its antarctic presence. The Poles seem to be independently operating their antarctic research program; at least, there is no evidence that the Soviets are involved. 25X1

Poland operates one year-round and one summer-only antarctic station. Arctowski, a major year-round station, is near the tip of the Antarctic Peninsula, adjacent to some of Antarctica's most productive fishing and krill-catching areas. Arctowski was established in 1977 as a center for meteorological observations and ecological, biological, geological, geophysical, and glaciological studies. Dobrowolski, the small summer-only station, is used for geophysical observations. The USSR turned this station over to the Poles in 1958, but it was not occupied between 1959 and 1978. 25X1
Dobrowolski was to be converted to a year-round station, but Poland's severe economic difficulties have forced cancellation of this plan. 25X1

Arctowski is one of three stations on King George Island. (The USSR and Chile also have stations there.) Reportedly, the station site was selected with Soviet assistance. The site may have been a poor choice because the area floods and is muddy during the spring. The area, however, is an excellent location for studying krill and other marine resources. 25X1

The Polish domestic economic situation is undoubtedly affecting Poland's overall antarctic program. The Secretary of the Polar Research Committee of the Polish Academy of Sciences has revealed that extensive large summer expeditions will be discontinued in favor of small research teams. Moreover, the 1981-85 draft research program includes many economizing measures.

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South Africa

Antarctic Position

Mineral-rich South Africa will have no need to exploit the mineral resources of Antarctica for many years, and it has expressed no immediate interest in doing so. South Africa lacks petroleum, however, and discovery of significant deposits in Antarctica would definitely attract South African interest. Its technological capabilities and proximity to Antarctica would give it advantage over most other Treaty signatories in developing antarctic resource deposits.

South Africa opposes any moratorium on resource-related activity in Antarctica. Instead, it has been pressing for establishment of a formal mineral resource regime. Perhaps to preempt any attempts by the United Nations or other international groups to gain control or influence over antarctic matters, in 1975 the South Africans proposed that the signatories establish a condominium to exercise sovereignty collectively over Antarctica. The South Africans are sensitive to pressures from the Third World and strongly oppose those countries sharing the potential wealth of the Antarctic.

Research Program

South Africa maintains one year-round station, SANAE (the South African National Antarctic Expedition), that focuses on geophysical and meteorological research.

Previously, South African research activities in Antarctica included a geological program inland from SANAE. It was designed, in part, to locate mineral deposits similar to those in areas of Africa that were adjacent to Antarctica in the geological past. These field activities were suspended in 1976 pending acquisition of a larger research/supply vessel for use in Antarctica.

The new vessel, the Agulhas, made its maiden voyage to Antarctica in 1978. Acquisition of the ship allows South Africa to upgrade its geologic and oceanographic research programs in the Antarctic. In addition to conducting oceanographic surveys, it can ply between South Africa and SANAE on resupply trips. Reportedly a 55-meter ice-strengthened fisheries research vessel, the Africana, is under construction and will enter antarctic service in 1982.

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Soviet Union

Antarctic Position

The Soviet Union is strongly committed to maintaining the Antarctic Treaty System and to protecting the interests of the Treaty nations. Up to the time of the Ninth Consultative Meeting in 1977, however, the Soviet delegation had adopted an extremely obstructionist stance in mineral resource negotiations. They objected to any consideration of a new legal regime, proposing instead the initiation of additional environmental and geological studies. They also strongly supported (in 1975) a 10- to 15-year moratorium on mineral and petroleum exploitation, apparently to prevent interference in the area by outside parties and to delay others until they were ready to begin exploitation.

At the 1977 meeting, the Soviets proposed a five-year moratorium, showed some willingness to allow progress on formulating a resources regime, and endorsed a policy of voluntary restraint in the interim. These commitments have held through the Tenth Consultative Meeting in 1979. 25X1

At the Preparatory Session for the Eleventh Consultative Meeting, the Soviets indicated a desire to see efforts toward setting up a minerals regime that would include all mineral resources and related activities. Apparently, they are beginning to understand that solution of the minerals question is essential to maintaining the Treaty. The Soviets insist that the final regime must be negotiated by, and reflect the interests of, the Consultative Nations and must incorporate advantages for the Treaty members. 25X1 25X1

Molodezhnaya, the Soviet Union's main station, is the second largest base on the continent. Research programs include surface and upper air meteorology; geomagnetic, ionspheric, aurora, meteor, snow, and hydrologic observations; geodetic satellite tracking; and medical studies. 25X1

Research Program

The extensive Soviet antarctic geologic-research effort—aside from its genuine scientific value—has in effect established Soviet presence and legitimacy in many parts of the continent, giving the Soviets a major voice in eventual settlement of the claims issue. The USSR, similar to the United States, has neither recognized nor made territorial claims in Antarctica and maintains stations in parts of the continent claimed by a number of countries.

The 26th Soviet Antarctic Expedition (SAE), conducted during the 1980-81 season, was the largest ever mounted by the USSR. A total of eight ships—five research/passenger and three cargo vessels—operated for three to seven months, supplying coastal bases and conducting research near the continent. About 1,400 persons, including 600 scientists and technicians, participated in the SAE.[6] About 300 scientists remained in Antarctica to conduct research during the 1981 austral winter at the USSR's seven year-round stations.

Near the end of the 1980-81 summer season the Soviets made their first direct operational flight from the USSR to the Antarctic.

The Molodezhnaya wheeled-aircraft landing strip has long been needed to facilitate visits by senior Soviet scientists and administrators. Soviet air operations in the Antarctic, nevertheless, are still hampered by the lack of an air-staging area in the Southern Hemisphere comparable to the US facility in New Zealand.

Another highlight of the 1980-81 Soviet season was the completion of the first full year of service by Russkaya, the Soviets' newest year-round station. Established in January 1980, this station fills the last gap in a circumantarctic network of Soviet stations that is unmatched by any other country.

[6] Most personnel remained aboard ship; only about 600 were landbased.

25X1

The Soviet antarctic geological and geophysical survey program, the largest of any of the countries, concentrates on researching useful land-based resources. Soviet geological reports typically include an analysis of the economic geology of studied areas. Each summer season since 1971, the Soviet Union has operated a large field station as a base for geological, geophysical, and mapping surveys. Druzhnaya, which is located at a point where the UK and Argentine claims overlap, is the current field base. It supports work in the Weddell Sea and in the Pensacola Mountains, the latter possibly the most promising regions in Antarctica for mineral exploration.

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According to A. F. Treshnikov, former head of the Soviet Arctic and Antarctic Institute, the next thrust of Soviet geologic research will be directed toward the base of the Antarctic Peninsula. The peninsula is considered a particularly favorable geologic environment for copper, molybdenum, lead, zinc, tin, tungsten, and other mineral deposits. As a consequence, the 26th SAE was assigned the important task of establishing three new summer scientific bases—Sheld, Geolog, and Druzhnaya II—all to engage in geologic research. Druzhnaya II, the largest of the three, is about 400 kilometers from Druzhnaya. These new facilities will permit continued expansion of the USSR's geologic program.

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The USSR's current geologic program does not suggest that commercial exploitation is in the offing. The Soviet Union has large reserves of metallic mineral resources and hydrocarbons in Siberia and in Soviet offshore areas that are likely to be tapped long before any major resource exploitation is started in Antarctica. Furthermore, offshore drilling, the activity that is probably most likely to yield the first antarctic hydrocarbons, is currently one of the Soviet Union's weakest technological areas.

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The USSR, among the world's leading fishing nations, is losing access to many of its traditional fishing grounds because of the proliferation of 200-mile national coastal zones. Considering its huge capital investments in distant-water fishing fleets and its dependence on fish for dietary protein, USSR interest in antarctic fish, particularly krill, is not surprising. The USSR maintains an antarctic whaling fleet and has conducted an exploratory fishery in antarctic waters since the mid-1960s. Small fishing fleets accompanied by research vessels operate each austral summer in the Scotia Sea and in the waters south of Kerguelen and New Zealand. [redacted] 25X1

These fleets have been concentrating on krill since the 1970s. In 1977-78, they caught 60,000 tons of krill. A reliable Japanese report indicates that 30 Soviet krill trawlers were sighted off the east coast of Antarctica at 140° East longitude in mid-January 1981. Two months later, the R/V Melville reported sighting about 35 Soviet krill trawlers off Elephant Island near the Antarctic Peninsula, on the opposite side of the continent. Because these were probably different fleets, it is possible that at least 65 Soviet vessels were engaged in krill fishing during the 1980-81 season. A US scholar thinks this number is conservative; he believes the number of vessels may be as high as 100 and that these vessels may have caught as much as 500,000 tons of krill. Although speculative, his catch estimate matches the high end of the 300,000 to 500,000 tons the Chileans say the USSR caught during the 1980-81 season. Officials of the US Government estimate that the Soviet catch has remained approximately at 100,000 tons for the past few years.
[redacted] 25X1

United Kingdom

Antarctic Position

The United Kingdom has taken one of the strongest environmental positions and has led efforts to establish a system for the conservation and rational use of antarctic resources. UK negotiators favor a regime that benefits the Consultative Parties. At the 1980 Consultative Meeting Preparatory Session, the United Kingdom questioned the need to negotiate a regime if substantial benefits are to go to the international community. The United Kingdom is basically opposed to any UN initiatives related to the southern ocean area, but—aware of possible international political repercussions—is exploring ways the Treaty Nations can permit, but control, limited UN activities. [redacted] 25X1

Prior to the Ninth Consultative Meeting in 1977, the United Kingdom seemed willing to subordinate its interests as a claimant state in favor of non-discriminatory access to minerals and hydrocarbon resources under a regime regulated by the Consultative Parties as a group. At the meeting, however, the British representatives stressed the opposite—that British rights as a claimant state must be taken into account when such a regime is devised. This shift probably reflected pressure from British industrial interests anxious to ensure a major UK role in any antarctic resource exploitation. It may also have been a trial balloon; the British probably noted that their unselfish lead would not likely be followed by the other claimant states. Whatever the reason, the United Kingdom now stresses the need for early resolution of the resource issue and opposes any moratorium on resource activity in the Antarctic. This position may change, however; a policy review is currently under way to establish a definitive UK position on minerals. [redacted] 25X1

Faraday is the smallest of the UK's four antarctic stations and is one of two British stations on the Antarctic Peninsula. It engages in a limited amount of scientific research including meteorology, upper atmospheric physics, and geophysics. [redacted] 25X1

Research Program

The United Kingdom considers itself the dean of the antarctic club. It has a long tradition of performing sound geological and biological research. The British Antarctic Survey (BAS) maintains four permanent stations in Antarctica; one other station is operated during the summer season as a base for geological surveys. Marine research programs conducted adjacent to the British Antarctic Territory are supported by two survey vessels and one Navy patrol ship. 25X1

Current BAS efforts include geological reconnaissance surveys, basic marine biology research, and seal surveys within its claimed area. This work appears to lack direct commercial motivation. The BAS geologic work is confined to the Antarctic Peninsula and includes research in petrology and geochemistry. Marine geophysics research is carried out by the HMS Endurance on routine crossings of the Scotia Sea. During the 1980-81 season, scientists from the United Kingdom's Scott Polar Research Institute participated with Norway in a joint iceberg research project in the Scotia Arc area. 25X1

United States

Antarctic Position

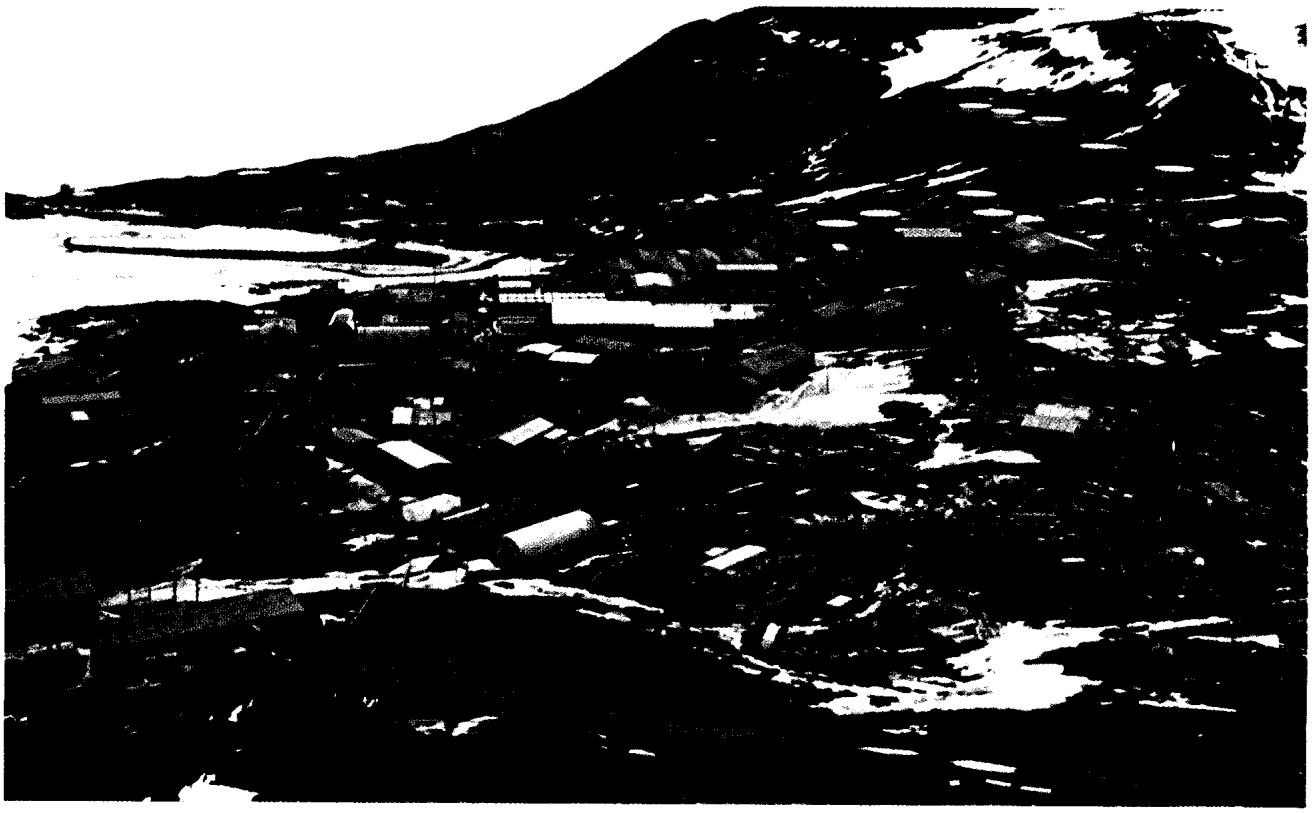
The United States has been the leader in Antarctica since the 1930s when exploration of the continent began in earnest. The United States has always maintained that the entire continent should be open to citizens of all nations; accordingly, it does not recognize the antarctic claims of any other country and has made no claims of its own but reserves the right to do so should circumstances change. The maintenance of permanent US stations within the claimed zones of other Consultative Nations and at the politically important South Pole supports the US position that the entire continent should be open to all nations that agree to abide by the provisions of the Treaty.

As for the antarctic resources issue, general US policy has been to ensure that:

- The viability of the Antarctic Treaty is preserved.
- The antarctic environment and ecosystems are protected.
- Antarctic resources are used wisely. 25X1
- The United States has the opportunity to share in the benefits of resource activities in Antarctica.

At the Ninth Consultative Meeting, the United States urged acceleration of efforts to develop an internationally acceptable antarctic resource regime. It also urged that all signatories refrain from commercial exploration or exploitation of antarctic mineral and petroleum resources while the regime was being negotiated. The United States indicated, however, that while it prefers 25X1 voluntary restraint to more formal arrangement, it would not object to a binding moratorium if the other 12 nations favored one. 25X1

McMurdo, with some 100 buildings, is the largest station in Antarctica. Its sprawling appearance somewhat resembles a mining town, consisting of streets, a harbor, a fire station, a community center, a chapel, and a hospital. The station operated on nuclear power from 1962 until 1972, when the nuclear plant was dismantled; electric power is now produced by diesel generators. 25X1



The United States hosted the Tenth Consultative Meeting and a preliminary session in December 1980 for the Eleventh Consultative Meeting. At the meeting, the United States got general acceptance that a basic purpose of a minerals regime was to establish: (1) that mineral resource activities are acceptable in Antarctica, and (2) regulations governing such activities. [redacted] 25X1

Research Program

US activities in the Antarctic, although primarily scientific, reflect US economic and territorial interests. US whalers and sealers have long since ceased operating in antarctic water, and the fishing industry has shown little, if any, interest in antarctic fish or krill; but the information gained from US antarctic oceanographic- and marine-biological surveys would prove useful should such interest arise. Similarly, other ship-based research contributes data useful in assessing potential resources of the continental shelf. For example, geological cores drilled in the Weddell Sea shelf in 1972, produced traces of natural gas. Assessment of the minerals resource potential is a major goal of the US onshore research program. [redacted] 25X1

Although the United States operates fewer stations than the USSR or Argentina, its research program is the largest and most sophisticated in Antarctica. This results in large part from superior logistics—especially air transport—which permit the conduct of wide-ranging field programs during the few months of good weather in the austral summer. [redacted] 25X1

The four permanent US stations are: McMurdo, the main US base and logistics center, which is in the sector claimed by New Zealand; Amundsen-Scott, at the South Pole where all claims converge; Siple, on the interior icecap in Chile's claim area; and Palmer, on an island off the Antarctic Peninsula in an area of overlapping claims. [redacted] 25X1

Acceding Nations

Brazil

Brazil acceded to the Antarctic Treaty in 1975 at the urging of the Brazilian Institute for Antarctic Studies (IBEA). This privately funded institution, created in 1972 and supported by the Brazilian press, has repeatedly called for the Brazilian Government to play a more active role in Antarctica. Although the Brazilian press continues to suggest that the departure of Brazil's first independent antarctic expedition is imminent, Brazil has yet to conduct an expedition. The government has, however, sought information from other countries regarding antarctic logistics and scientific matters in apparent preparation for antarctic operations. Reportedly, IBEA recently acquired a polar research vessel, which is being outfitted and repaired at a US shipyard.

Prior to its Treaty accession, Brazil reportedly had considered making a territorial claim overlapping the claims of Argentina and the United Kingdom. By acceding to the Treaty, however, Brazil has in effect postponed any such claim for the Treaty's duration. Brazil is expected to establish a research station in the Antarctic Peninsula–Weddell Sea area and on that basis apply for full consultative status. Chile has offered Brazil assistance in establishing a research program by sponsoring Brazilian scientists to the Antarctic, additional support can also be expected from Peru. Such joint efforts are aimed at emphasizing Latin American presence in Antarctica. (S NF)

German Democratic Republic

The German Democratic Republic (GDR) acceded to the Antarctic Treaty in 1974, but has never conducted an independent antarctic expedition. It is, however, the most active of the nonconsultative countries, conducting the bulk of its antarctic research at the Soviet Bellingshausen, Druzhnaya, and Novolazerevskaya Stations. Over the years, nearly 100 East German scientists have participated in Soviet research expeditions; nine are wintering-over with the USSR during the 1981 austral winter. In 1980, the GDR was granted conditional membership in the Scientific Committee on Antarctic Research, an international organization. 25X1

Conflicting reports regarding GDR intentions in Antarctica began circulating in 1980. Indeed, the stage appeared set for the GDR to seek Consultative status by establishing an independent scientific program and a research station in Antarctica; preparations were evidently under way for an independent expedition. Costs, however, forced cancellation of these plans. 25X1 25X1

The GDR was the only nonconsultative nation to sign the Antarctic Marine Living Resources Convention, and the scientific work of its Institute for Deep-sea Fishing and Fish Processing during the 1980-81 season included surveys of the sea areas of the South Orkney and South Shetland Islands. The GDR has also shown interest in krill-catch techniques. 25X1

Other Acceding Nations

The other nine nations—Bulgaria, Czechoslovakia, Denmark, Italy, the Netherlands, Papua New Guinea, Peru, Romania, and Uruguay—that have acceded to the Antarctic Treaty do not now conduct independent antarctic expeditions. Bulgaria, Czechoslovakia, and Romania have sponsored individual scientists on Soviet expeditions, but none has been as active as East Germany. Denmark's antarctic endeavors are limited to serving as the country of registry for several ships that provide logistics support to Australian and French antarctic expeditions. The Netherlands acceded to the Treaty in 1967 after having sponsored a joint expedition with Belgium from 1964 to 1967, but it has shown little interest in the Antarctic since then. Italy, Papua New Guinea,[7] Peru, and Uruguay are the most recent signatories to the Treaty, but are not expected to mount independent operations. [redacted] 25X1

[7] Papua New Guinea (PNG) technically became a Treaty signatory during the period in which it was a trust territory of Australia. Following independence, PNG reviewed those treaties to which it was bound and ultimately decided to accede formally to the Antarctic Treaty. [redacted] 25X1

Nonacceding Nations

China

China may accede to the Treaty within the near future and reportedly intends to construct a research station. The State Council has approved a National Antarctic Survey Committee to oversee the Chinese antarctic program. A Chinese survey team reportedly accompanied the French expedition to Dumont d'Urville in February 1978 as part of the French-Chinese agreement on scientific and technical cooperation. In 1978 and 1979, Chinese and Chilean officials held a series of discussions during which they agreed to set up a joint commission to conduct oceanographic and climatological studies and research on resources in Antarctica. The agreement also calls for Chinese scientists to work at Chilean stations; however, no evidence suggests that this agreement has been implemented.

The Chinese have also sought antarctic assistance from Australia and New Zealand. During the 1979-80 season, two Chinese scientists conducted research at the Australian Casey Station; two Chinese scientists are wintering-over at Casey during the 1981 austral winter. New Zealand's assistance has been mainly limited to providing technical advice.

The Chinese State Oceanographic Bureau has indicated it plans to expand its oceanographic research into most areas of the world, including the Antarctic. The Bureau intends to establish an information exchange arrangement with other countries and to participate actively in international conferences on oceanic affairs. To improve its oceanographic research capability, in 1978 China bought a Japanese 4,200-ton oceanographic survey vessel specially strengthened for work in polar waters.

As part of this oceanographic effort, the Chinese are establishing a National Committee on Antarctic Research to represent all organizations with antarctic interests, including the Chinese Foreign Ministry. An Antarctic Division has already been established within the National Bureau of Oceanography. Antarctic marine science is obviously a major Chinese interest.

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An active scientific effort in Antarctica and a high profile in political matters affecting the continent would be in keeping with China's modernization program. Whether such a course of action offers any threat to the current antarctic situation depends on whether China chooses to operate within or outside of the Treaty framework. At present, it appears that the Chinese will work within the framework of the Treaty. Such a decision should please even the USSR, which is quietly following Chinese overtures into the Antarctic.

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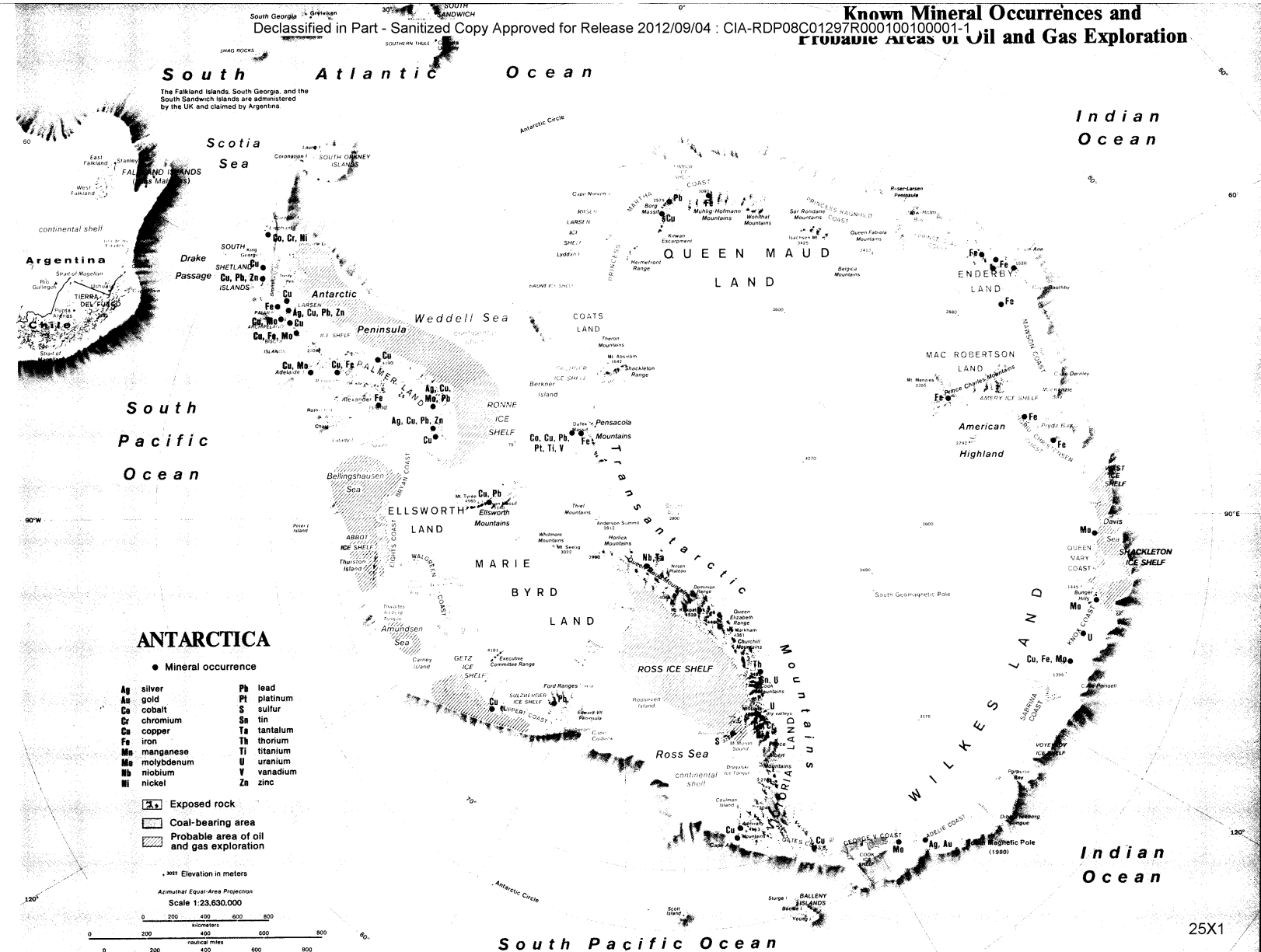
Other Nonacceding Nations

Taiwan has displayed increasing interest in exploiting marine living resources in the southern ocean area. Its Council for Economic Planning and Development is currently studying a plan to explore fishery resources there. The experimental fishing vessel Haikung has twice visited the area and in 1977 caught 125 tons of krill. China's demonstrated interest in the Antarctic, however, is a major setback for any Taiwanese plans to seek additional participation in antarctic activities. 25X1

For the past three years South Korean vessels have conducted experimental antarctic cruises in search of krill. During the 1979-80 season the 5,500-ton fisheries research vessel Nambuk surveyed krill and fish resources in the southern ocean area. According to the Koreans, these expeditions gathered valuable experience and data for future operations. More than 500 tons of krill were caught during the 1978-79 season. South Korea has also expressed interest in the coal and petroleum potential of Antarctica and in the conduct of an expedition on the continent. Although the government has stated that it would like to accede to the Treaty, political considerations would almost certainly exclude the South Koreans from early admission as a full Consultative Nation. 25X1

Known Mineral Occurrences and Probable Areas of Oil and Gas Exploration



The Falkland Islands, South Georgia, and the South Sandwich Islands are administered by the UK and claimed by Argentina.

ANTARCTICA

● Mineral occurrence

Ag	silver	Pb	lead
Au	gold	Pt	platinum
Co	cobalt	S	sulfur
Cr	chromium	Sn	tin
Cu	copper	Ta	tantalum
Fe	iron	Th	thorium
Mn	manganese	Ti	titanium
Mo	molybdenum	U	uranium
Nb	niobium	V	vanadium
Ni	nickel	Zn	zinc

Exposed rock

Coal-bearing area

Probable area of oil and gas exploration

3023 Elevation in meters

Azimuthal Equal-Area Projection

Scale 1:23,630,000

0 200 400 600 800 kilometers

0 200 400 600 800 nautical miles

0 200 400 600 800 statute miles

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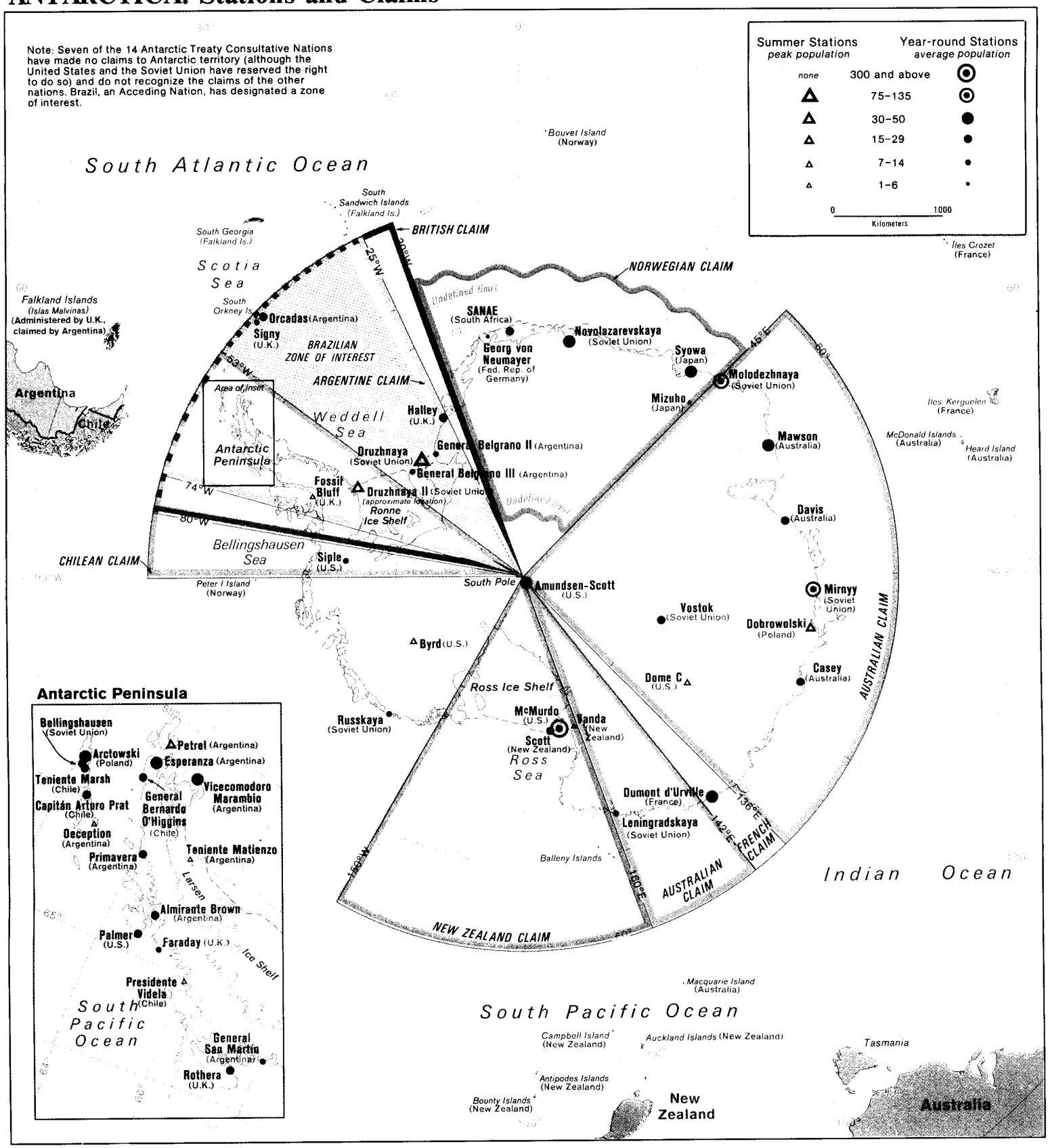
ANTARCTICA: Stations and Claims



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