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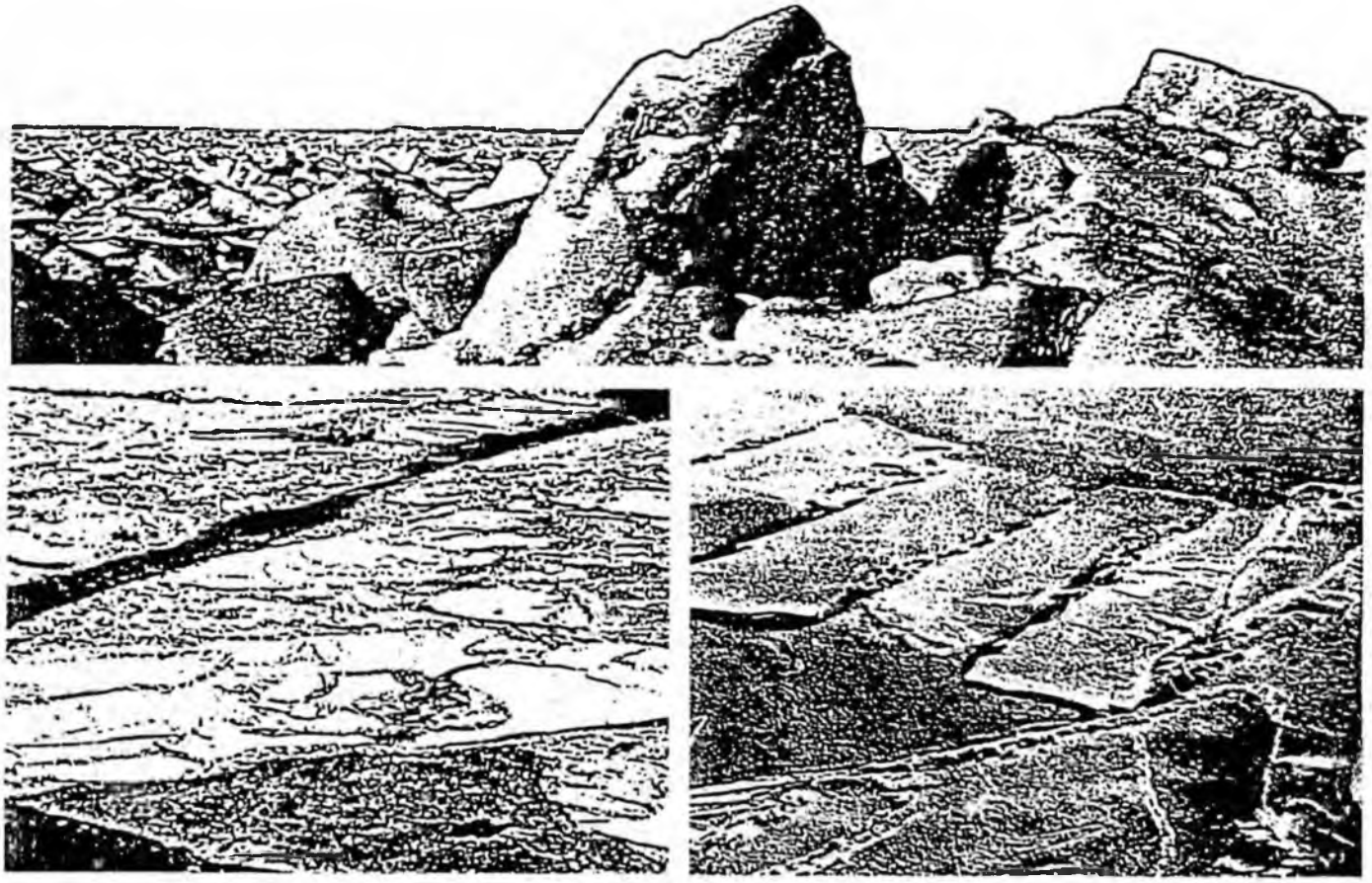
THE UNITED STATES: AN ARCTIC NATION



Report of the U.S. Arctic Research Commission To the President and the Congress Of the United States of America

For the Period 1 October 1985 - 30 September 1986

U.S. Arctic Research Commission

January 31, 1987

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3500 South Figueroa, Suite 114
Los Angeles, California 90007

Preface

The Arctic Research and Policy Act of 1984 (P.L. 98-373) requires that the U.S. Arctic Research Commission, which was established under Section 103(a) of this act, shall submit to the President of the United States and the Congress, not later than January 31 of each year, a report describing its activities and accomplishments during the immediately preceding fiscal year. In fulfillment of this provision of the act, the Commission has prepared the following report covering the period 1 October 1985 through 30 September 1986—fiscal year 1986. (For a description of the creation of the Commission on 28 January 1985 and of its activities during its initial seven months of operation, see *U.S. on the Arctic Rim. Report of the U.S. Arctic Research Commission to the President and the Congress of the United States of America for the Period 1 March—30 September 1985*, Los Angeles, California: U.S. Arctic Research Commission, January 31, 1986.)

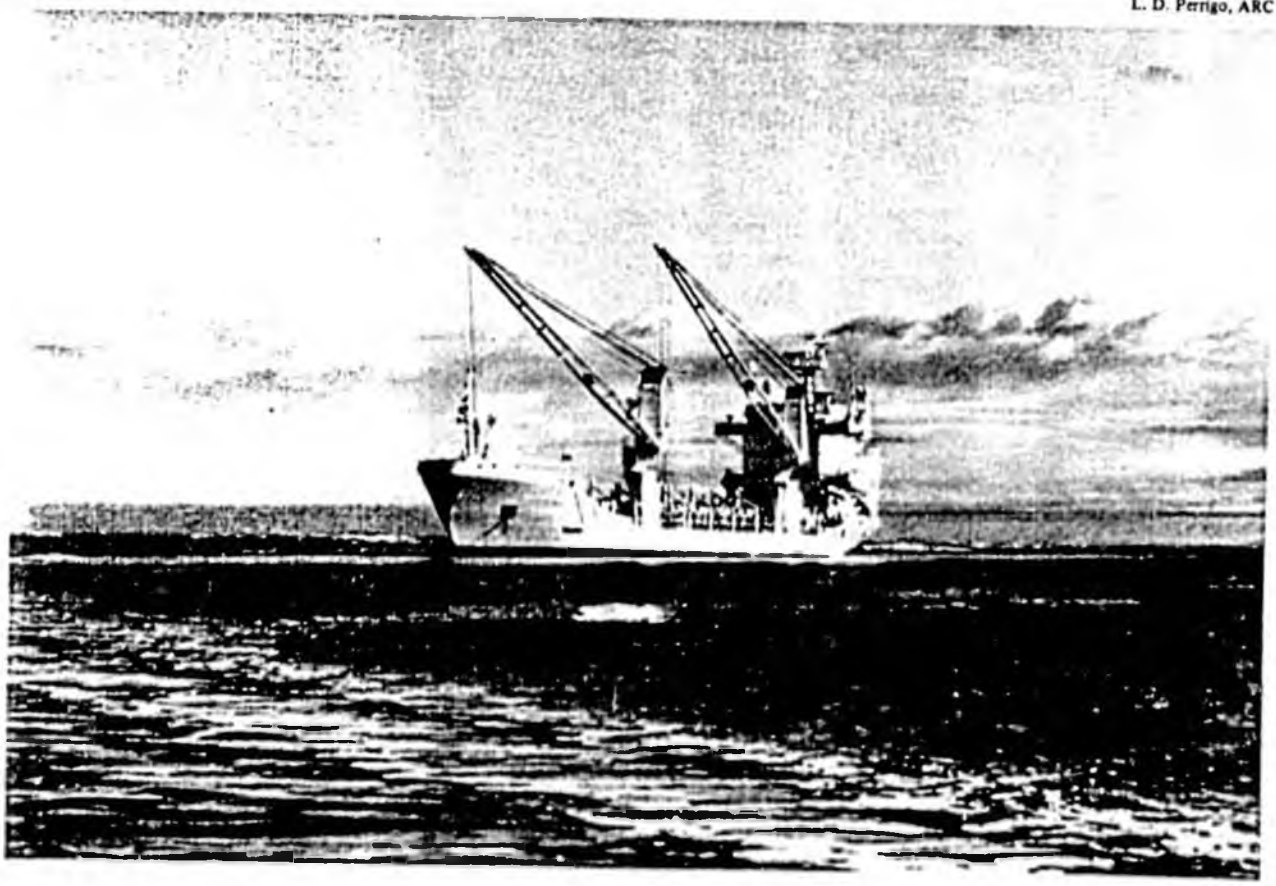
Arctic Boundary defined by the Arctic Research and Policy Act of 1984

Adapted from National Issues and Research Priorities in the Arctic Polar Research Board, National Research Council, Washington, D.C. 1985.

Contents

Ice-strengthened cargo vessels may be used with containerized laboratories for research during the summer months in the pack ice.

L. D. Perrigo, ARC



1 Executive Summary

The five-member Arctic Research Commission, created under the Arctic Research and Policy Act of 1984, reported in January 1986 on its initial seven months of operation from March through September 1985 (see *U.S. on the Arctic Rim*, Arctic Research Commission, January 31, 1986). This second annual report covers the period October 1, 1985 through September 30, 1986.

The imperative in 1987 is to stimulate public awareness of the United States as an arctic nation.

In this interval a principal objective of the Commission was to increase interaction with the scientific and engineering communities and with representatives of governmental, industrial, and academic organizations in Alaska. To achieve this objective, it undertook the following:

- Opened an office in Alaska at the University of Alaska's Arctic Environmental Information and Data Center (AEIDC) in Anchorage.
- Began publishing a newsletter to provide current information on its activities and on matters relevant to arctic research and policy.
- Established a group of advisors of 24 scientists and engineers, whose members participated in public sessions organized by the Commission, reviewed draft documents, and provided information on research needs.
- Held public meetings—one in Seattle, one in Kodiak, and one in Anchorage—to obtain a wide range of views on arctic research policy and research needs.
- Visited industrial sites in Alaska to learn more about problems, needs, and future opportunities.
- Met with the governor and legislature of Alaska and with state legislative and executive organizations concerned with arctic research and policy.
- Published two reports on its findings and recommendations, in addition to which three Commission members published articles on Commission activities in scientific journals.
- Was represented at national and international meetings concerned with arctic research.
- Met with members of the press following public meetings and on other occasions, at least one such interview having appeared on television in Alaska.

The Arctic Research and Policy Act assigns a number of responsibilities to the Commission. These include recommending arctic research policy and priorities, cooperating with the Interagency Arctic Research Policy Committee on development of an integrated five-year plan for arctic research, fostering federal/state cooperation in arctic research, and recommending ways to improve logistic support of arctic research, handling of the information and data resulting from arctic research, and coordination of federal agency programs of arctic research.

During fiscal year 1986 Commission activities in response to this mandate were as follows.

Arctic Research Policy and Priorities

- Developed and transmitted to the Interagency Committee a statement on Arctic Research Policy. This statement was subsequently used by the Interagency Committee.
- Published a report, *National Needs and Arctic Research: A Framework for Action*, in which the Commission outlined a rationale for arctic research and recommended, in order of priority, several broad research areas.

Cooperation with the Interagency Committee

- Continued close contact with the Interagency Committee, with each represented at the meetings of the other, and with the exchange of documents for information and for review and comment.
- Prepared an analysis of the preliminary draft of the five-year plan for arctic research, comparing it with Commission priorities and with current federal agency arctic research programs.
- Planned to observe activities at the November 1986 workshop to refine and further develop the arctic research plan, and to review the document resulting from this workshop.

Federal/State Cooperation

- Held a meeting at the State Capitol in Juneau in January 1986 during which the Commission met with the governor, the state legislature, and the Senate and House Committees on Resources.
- Encouraged the adoption of an Alaska research policy, which was subsequently approved and signed into law by the governor on May 24, 1986.
- With the governor of Alaska, proposed to the relevant federal and state agencies the organization of joint federal/state task forces in fisheries and health. The charge to these two groups, which were subsequently established, was to identify research needs and recommend a responsive program of research for federal/state cooperation.
- With the governor of Alaska, provided encouragement and suggestions to the Committee for Natural Resource Information Management (CONRIM) as an initial step toward achieving a more effective arctic research information system.
- Urged the President and Congress to restore the more than $4 million proposed as a budget reduction for the National Oceanic and Atmospheric Administration (NOAA) for fisheries research in the Bering Sea in order to ensure the accumulation of data needed to manage these fisheries (which account for 40 percent of the total U.S. fish harvest from U.S. waters, annual revenue of some $2 billion, and jobs for 50,000).

Logistic Support

- Met with the Commandant of the U.S. Coast Guard to discuss needs and problems related to support of scientific activities on icebreakers and plans for two new icebreaking vessels with enhanced science support capability.
- Planned a workshop on logistics, to be held concurrently with the Interagency Committee's November 1986 workshop on the five-year arctic research plan. The objective is to review present logistic capabilities and needs.

Information Handling

- Encouraged the work of the Committee on Natural Resource Information Management (CONRIM).
- Located its Alaska Office at the Arctic Environmental Information and Data Center (AEIDC) to maintain awareness of new initiatives in information handling.

The Commission considered two special problems...international cooperation in arctic research...(and) lack of public awareness of the importance of the Arctic to the United States.

- Encouraged the transfer of nonproprietary reports and data from industry to information systems and services in the public domain.

Coordination of Federal Agency Arctic Research

- Began to review programs in various fields of research.

Most of the Commission's work in response to this aspect of its mandate will take place after the five-year arctic research plan is complete. It can then review federal agency activities in relation to the plan and recommend ways to improve coordination and cooperation.

In addition to these special responsibilities, the Commission considered two special problems, one of which was international cooperation in arctic research. There is widespread awareness of the need for improved international cooperation in the Arctic where the geographic area, the scientific questions, and the problems residents face are common to all nations that have territory in the Arctic. Other nations not located in the Arctic also have an interest in arctic research. Many organizations exist to foster cooperation, and there have been successful binational and multinational efforts. Yet concern about international cooperation in the Arctic increases. As a first step toward the possible creation of an international forum to identify arctic research needs and facilitate international cooperation in addressing them, the Commission did the following:

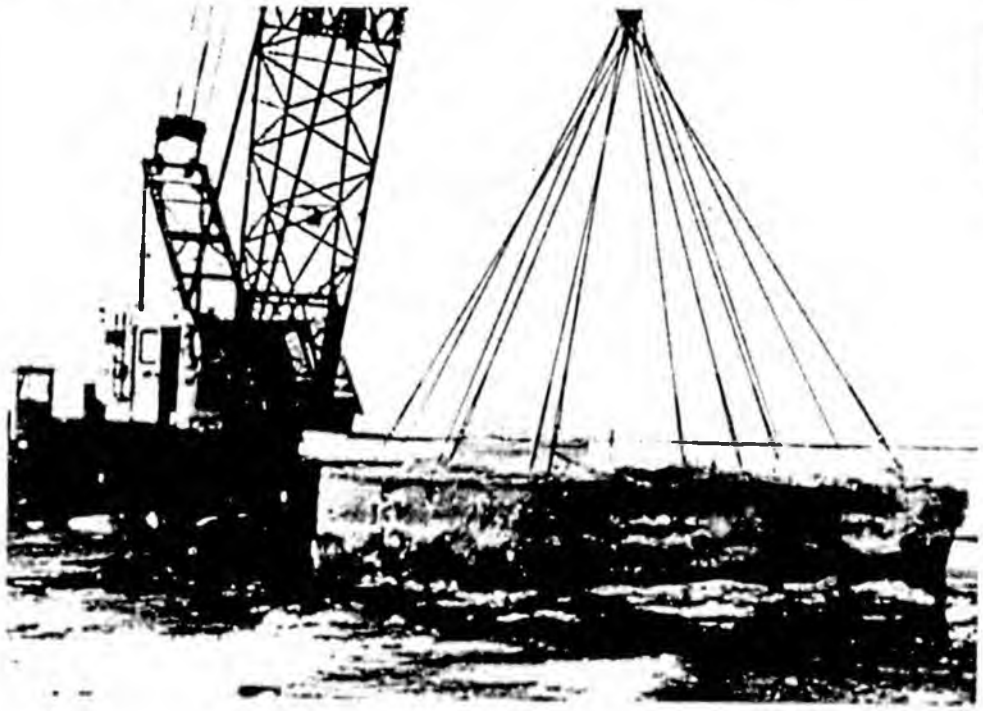
- The Commission chairman held a small meeting in July 1986 of key representatives from a number of countries interested in arctic research. There was consensus on organizing a larger follow-up session in 1987 to explore further the organization of an international forum for arctic research. The representative from Norway is taking the lead in planning this session, with the Commission assisting as needed.
- Compiled a catalog of "Arctic Cooperative Research Agreements and Major Arctic-Rim Research Organizations" as background for planning.

The second problem is lack of public awareness of the United States as an arctic nation and of support for the role it must play in that region. Although Presidential memoranda, Congressional acts, and many programs of public and private organizations provide a rationale for increased U.S. research in the Arctic, the general public and many of its leaders are not yet aware of what the U.S. Arctic means to the nation. There is but limited recognition as yet of the crucial role of the Arctic in national security, national economic well-being (its vast renewable and nonrenewable resources), environment (the impact on weather and climate), and biomedical, health, and sociocultural research, which has widespread implications and applications. U.S. activities in the Arctic also affect the nation's international position.

Fostering awareness of the United States as an arctic nation will be a main thrust of the Commission's public relations efforts in the next fiscal year.

W. G. Nelson, UAA

Research engineers remove slabs of nearshore ice. Measurements will provide information about the mechanical properties of the ice.



W. G. Nelson, UAA

2 Introduction

Background

In March 1985, in accordance with the provisions of the Arctic Research and Policy Act of 1984 (P.L. 98-373; July 31, 1984) (see Appendix A), the President of the United States appointed the five-member Arctic Research Commission (Appendix B). Three members represent research institutions: Commission Chairman James H. Zumberge, University of Southern California; Vice Chairman Juan G. Roederer, Geophysical Institute, University of Alaska-Fairbanks; and A. Lincoln Washburn, Quaternary Research Center, University of Washington. One member, Oliver Leavitt, of the Arctic Slope Regional Corporation, Barrow, Alaska, represents indigenous residents of the U.S. Arctic, and one member, Elmer E. Rasmuson of Anchorage, Alaska, represents industry. Terms of service on the Commission are four years, except for three initial appointments of shorter duration, thus providing for both rotation and continuity in membership. Serving *ex officio* on the Commission is the Director of the National Science Foundation (NSF), which is the lead agency under the act, responsible for implementation of arctic research policy and for chairing the Interagency Arctic Research Policy Committee. The Interagency Committee is composed of representatives of 10 federal agencies with programs of arctic research.

The U.S. has entered "the Age of the Arctic," in which the Arctic is becoming one of the world's most strategic areas.

The Act assigns the Commission a specific set of responsibilities. These include:

- Developing and recommending arctic research policy, and publishing annually a statement of policy and goals.
- Cooperating with the Interagency Committee in the development of a national arctic research program plan to implement arctic research policy, and assisting and advising the Interagency Committee on matters related to arctic research policy and planning.
- Fostering cooperation in arctic research among federal, state, and local organizations, and working with the Governor of the State of Alaska and such persons and organizations as he may designate to strengthen arctic research.
- Recommending ways to improve logistic planning and support of arctic research.
- Reviewing federal agency arctic research programs and recommending ways to improve coordination in relation to the arctic research plan and objectives.

Much of this report for fiscal year 1986 deals with activities in response to these provisions of the Commission's mandate.

The Commission's main office is at the University of Southern California in Los Angeles; in January 1986 it opened a second office in Anchorage, Alaska (as discussed in the chapter on "Outreach"). The Commission staff consists of nearly

full-time (80%) Executive Director and an Administrative Assistant in its Los Angeles office, and a part-time (50%) Senior Staff Officer in the Anchorage office to become full-time October 1, 1986.

The Commission held four meetings during FY 1986:

- November 14-15, 1985 at the University of Southern California, Los Angeles (14th) and the Applied Physics Laboratory, University of Washington, Seattle (15th);
- January 31, 1986 at the State Capitol Building, Juneau, Alaska;
- April 27-29, 1986 in Kodiak, Alaska (27th & 28th) and Anchorage, Alaska (29th);
- July 23, 1986 at the University of Southern California, Los Angeles.

Two of these meetings included well-attended public sessions for the presentation of testimony on arctic research and policy, and one included site visits to industrial facilities in Alaska. (These sessions are described in later sections of the report; see also Appendix E.)

Funds for Commission operation are appropriated by the Congress as a part of the budget of the National Science Foundation (NSF). The amount requested for operation in FY 1986 was $300,000; the amount appropriated, in accordance with the provisions of the Gramm-Rudman-Hollings Act, was $285,523. However, the Commission received a supplement appropriation of $100,000 late in fiscal year 1985 for its fiscal year 1985 and 1986 activities, which provided for an overall operating budget of approximately $375,000 for fiscal year 1986. The University of Southern California serves as administrative agent for the Commission.

The Commission uses meetings and workshops to acquire and disseminate information about particular as well as general research needs.

Tobors Associates

Organization of the Report

In the chapter that follows on "Outreach," the Commission describes steps it has taken to broaden its contact with the scientific and engineering communities and with the governor, legislature, and residents of the State of Alaska. It also discusses efforts to draw attention to its existence, its mandate, and its activities as a means of stimulating interaction with public and private organizations, research groups, and individuals, so that their needs, concerns, and viewpoints will receive attention in the development of arctic research policy and programs. International cooperation is, of course, one aspect of outreach; however, this subject is so special and complex that it is treated in a separate section.

The next chapter, "Response to Mandate," is divided into six sections, and discusses the Commission's activities during FY 1986 in relation to the various responsibilities assigned to it under the Arctic Research and Policy Act. This chapter is the core of the report, and may be used to judge how the Commission is fulfilling the role prescribed for it.

There follows a chapter on "Other Concerns," which treats two problems. One of these is international cooperation in arctic research. Awareness of this need and efforts of various kinds to meet it have been widespread. This chapter describes some of the difficulties and describes some exploratory steps that the Commission is taking. The second problem is to build awareness in the United States of America that this country is an arctic nation—that our State of Alaska is a key factor in our economy, our environment, our national defense, our international position, and our future.

The concluding chapter, "Looking Ahead," mentions some Commission activities getting under way in FY 1987.

Self-powered, radioluminescent lights provide a reliable, cost-effective alternative to incandescent systems for remote, arctic runways.

G. A. Jensen, PNL

3 Outreach

Alaska Office

In January 1986, the Commission opened an office in Anchorage, Alaska, at the University of Alaska's Arctic Environmental Information and Data Center (AEIDC), 707 A Street, Anchorage, with a part-time staff officer in charge. The Commission's objective in creating this office was to have a point of contact in the state that would facilitate interaction with the state government, academic and industrial organizations, public interest groups, and the general public. The Alaska office transmits information from these groups to the Commission, keeps them informed about Commission activities and plans, and assists with arrangements for the meetings, site visits, and public sessions that the Commission holds in Alaska each year.

By locating its Alaska office at AEIDC, the Commission hopes to maintain awareness of new initiatives and problems related to information handling.

The Governor of the State of Alaska, Bill Sheffield, welcomed this effort to provide closer ties with the state, emphasized the importance of the Commission's maintaining an active presence in Alaska, and requested the state legislature to authorize partial funding for the office.

The Commission's newsletter, initiated shortly after the opening of the Anchorage office, is prepared and circulated by the Alaska office staff. *On the Arctic Rim—Newsletter of the U.S. Arctic Research Commission* appeared first in April 1986, with a second issue published in August. The newsletter is expected to become a quarterly publication. It provides information on Commission activities, such as the scheduling of public meetings in Alaska, and on state actions related to arctic research and policy—for example, passage of the Alaska Research Policy Act, which was signed into law in May 1986.

Group of Advisors

At its November 1985 meeting, the Commission unanimously agreed to establish a group of advisors who would provide additional points of contact with the scientific and engineering communities and expertise in fields of particular concern to the Commission. The advisors would review documents circulated to them by the Commission, bring concerns of the scientific and engineering communities to the attention of the Commission, and assist as needed in Commission deliberations on arctic research policy and planning. Their work would be conducted primarily through correspondence and telephone conferences, although one or more of them might be requested to participate occasionally in a Commission meeting and to report in detail on a field of research, a particular research program, or a problem

related to arctic research policy. They would also keep the Commission informed about any national or international meetings they attended that dealt with arctic research.

Early in 1986, 24 scientists and engineers were invited to serve as advisors to the Commission and accepted such service. Their names and professional affiliations appear in Appendix C. To date they have been represented in public sessions organized by the Commission; commented on draft documents of the Commission, as well as on the Interagency Committee's July 1986 draft of "Federal Agency Research: Draft Recommendations for Necessary Programs;" and assisted in Commission reviews of research needs in various fields. For example, one of the advisors, Dr. Oran R. Young (Center for Northern Studies), presented an invited lecture on "Arctic Geopolitics and Their Impact on Research" at the public meeting held in Anchorage on May 29; another, Dr. John Middaugh (Alaska Department of Health & Social Services) attended the Commission's July meeting in Los Angeles to discuss arctic health research and some actions that the Commission might take to stimulate greater attention to the needs and opportunities in this field.

Public Meetings and Site Visits

On November 15, 1985 in Seattle, the Commission held a public meeting at which participants were invited to present their views on arctic research policy and needs. Some 40 persons attended. Nine written statements were submitted to supplement comments and discussion at the meeting. A major emphasis was the need for applied, problem-oriented research, together with basic research—for a broad continuum of studies ranging from the most basic to the kind of knowledge necessary to solve immediate problems and apply new processes and equipment. Stressed was the need for a multidisciplinary approach, including both long- and short-term studies, giving particular attention to the human role in the Arctic and the importance of the Arctic to the nation.

A major emphasis was the need for applied, problem-oriented research together with basic research.

Participants also strongly urged that greater research effort be addressed to ice dynamics, subsea permafrost, weather forecasting, marine and terrestrial ecology, hydrology, dynamics of soil development, atmospheric effects on communications and defense systems, health, fisheries, and studies to resolve geopolitical and jurisdictional problems. It was emphasized that studies of seasonal variability related to snow and ice cover and other natural conditions were needed in order to build a data base against which to measure natural changes and the impact of human activities.

One participant discussed the need "to bring modern oceanography to the Arctic." He pointed out that understanding how the ocean is ventilated is a key to understanding climate, pollution transfer, and the global cycling of carbon. He called for a long-term commitment to research in the northern seas.

The importance of international cooperation in arctic research was a common theme, with various suggestions offered for improvement. Among these were efforts

at higher levels of government to foster the cooperation that already exists among many working scientists or research institutions in different countries; improved logistic, operational, and monetary support of U.S. participation in large international research programs; and greater continuity in observations and data collection conducted as part of international research programs.

Additional written information provided following this meeting dealt with the files and operation of the Arctic Environmental Information and Data Center (AEIDC) and with the research program of the Sea Use Council. This council, which was established in 1969, is composed of representatives of federal, state, and provincial government agencies concerned with the northeast Pacific Ocean region. Its research program includes a wide range of studies pertaining to marine environmental monitoring, coastal zone planning, fisheries and aquaculture, and impacts of resource development.

A second public meeting took place in Kodiak, Alaska, on April 28, 1986, with 45 participants. The session dealt primarily with research needs related to fisheries and marine ecosystems. Statements at the meetings and background documents stressed the need to understand the causes of increases and decreases in fish and shellfish populations as a basis for sound management of fisheries. At present, more data are needed on the relationship between variations in fish stocks and variations in predator populations, changes in the environment, physical/chemical characteristics of the sea, disease, overfishing, and many other factors. There was consensus on the need for (a) continuing abundance estimates and forecasts, (b) studies of ecosystem dynamics, and (c) studies of the impact of fishing gear on nontarget species. Increased cooperation between federal and state governments in fisheries research and the sharing of data were especially urged.

In addition to fisheries research, other topics proposed for study were construction materials and safety—from improved vessel design to new approaches to design of cold water survival suits to more and better information on weather. Studies suggested in regard to materials dealt with effects of large ambient temperature swings, problems that occur when materials with different rates of expansion and contraction are combined as in structures, and testing of new materials under the conditions imposed by the arctic environment. It was pointed out that the costs of repair far exceed the original cost of a sound structure—that better structural materials research could save money, as could improved access to information about previous experience with various materials.

The U.S. Arctic is one of the richest commercial fisheries in the world, and one of this country's greatest commercial assets.

Following the public session, the Commission met with members of the city and borough government of Kodiak, attended a demonstration of a cold water survival suit, met with members of the Fisheries Industry Technical Center, and visited a surimi production facility. Surimi is a deboned, refined, high-protein material made from fresh white fish such as pollock and artificially flavored to resemble, for example, crab or lobster. The United States has imported most of the surimi it uses—some 30,000 metric tons in 1984. The beginning of production in Alaska

could lead to a $6 billion/year industry within the next two decades. The Alaska fisheries already constitute 40 percent of the U.S. total annual fish harvest; with this new thrust, our Arctic-rim state could make an even greater contribution to the U.S. economy in the future.

The principal item on the agenda of the public meeting in Anchorage on April 29 was a lecture by Dr. Oran Young, whose theme was the U.S. entrance into "the Age of the Arctic," an era in which the Arctic is becoming one of the world's most important strategic areas, and in which issues related to the Arctic will increasingly demand our attention. To deal with these issues will require not only knowledge of natural systems but of social, cultural, economic, legal, political, and military developments in the arctic environment. In his lecture "Arctic Geopolitics and Its Impact on Research," Dr. Young discussed some of the developments and their implications that are bringing about "the Age of the Arctic.'

Driving the emergence of the Arctic as a dominant concern are its militarization and industrialization. Dr. Young described some of the military activities and systems operating in the Arctic, noting that nuclear-powered submarines carrying sea-launched ballistic missiles have the potential to strike nearly all key targets in both the Soviet Union and the United States. In regard to industrialization, he summarized data on the magnitude of oil and gas resources, as well as of coal, other minerals and ores, and hydroelectric power. Resource exploitation can result in environmental, social, and cultural problems and adversely affect renewable resources such as fish and timber. To devise ways to resolve the conflicts and arrive at arrangements that reconcile local interests and the national interest is the challenge we face now and in the years ahead.

Further, the Arctic is a vast geographic area that overlaps the boundaries of a number of nations. The "mutually beneficial international cooperation" called for in statements of arctic policy is a growing need. It is essential for effective research on climatic phenomena, the oceans and marine ecosystems, the effects of atmospheric and marine pollution, and much else. U.S. interests demand that this country take its place among the arctic nations and recognize itself as such. (For a fuller exposition of Dr. Young's views, see: Young, O.R. The Age of the Arctic. *Foreign Policy*, 61, Winter 1985-86, pp. 160-179.)

In the ensuing discussion, it was noted that the Arctic Research and Policy Act offers an opportunity for an effective response to this challenge and that, among other things, the Commission could play an important part in fostering awareness of the United States as an arctic nation among U.S. leaders and the public.

In a series of informal presentations and comments, a variety of research opportunities and needs were then described, with particular attention to circumpolar health research. The International Union for Circumpolar Health was established at an international meeting in Stockholm in March 1986, and Professor Theodore A. Mala, School of Health Sciences, University of Alaska, was elected Secretary General, with the Secretariat located at the University of Alaska. There was consensus that the time is right for a greatly expanded effort in arctic health research and for increased international cooperation in such research.

Other fields of arctic research proposed by participants included: bowhead whale habitat, migration, and feeding patterns; impacts of oilfields on waterfowl, caribou, and other wildlife; environmental impacts of placer mining and improved technologies for these operations; impacts of fisheries on seabird; and psychological

studies of responses to the long intervals of winter darkness and to winter overcrowding in small communities of populations that are typically widely dispersed in other seasons.

Publications and Other Activities

To meet its responsibilities under the act, to broaden awareness of its work, and to stimulate interaction with those engaged in or concerned with arctic research, the Commission published two reports and began to issue a newsletter in 1986. In addition, three Commission members prepared articles about Commission activities for publication in scientific journals. These publications are as follows:

- *U.S. On the Arctic Rim. Report of the U.S. Arctic Research Commission to the President and the Congress of the United States of America for the Period 1 March - 30 September 1985.* Los Angeles, California: U.S. Arctic Research Commission, January 31, 1986.
- *National Needs and Arctic Research: A Framework for Action. Report of the U.S. Arctic Research Commission to the President and the Congress of the United States of America.* Los Angeles, California: U.S. Arctic Research Commission, May 30, 1986.
- *U.S. On the Arctic Rim. Newsletter of the Arctic Research Commission.* Anchorage, Alaska: U.S. Arctic Research Commission, April and August 1986.
- Zumberge, J. H. The Arctic Ocean—Introduction. *Oceanus*, Volume 29, Number 1, Spring 1986. Pages 2-8.
- Roederer, J. G. Research Priorities in the Arctic: U.S. Arctic Research Commission Gets Down to Business. *EOS. Transactions, American Geophysical Union*, 67(24), June 17, 1986.
- Washburn, A. L. and G. Weller. Arctic Research in the National Interest. *Science*, 233, 8 August 1986.

The Commission has also participated in a number of press conferences that usually followed public meetings. There was also an interview with representatives of the press following the January 1986 meeting of the Commission with the governor of Alaska, members of his cabinet, and the state legislature. In addition, in September 1986, three Commission members and its Executive Director met with Senator Ted Stevens to discuss the Commission's work, a 30-minute interview that was subsequently shown on public television in Alaska.

A child looks on as a researcher from the Arctic Investigations Laboratory collects a blood sample. The hepatitis B vaccine study is designed to prevent infection from hepatitis B virus and determine the need for a booster shot.

Mary Rabiego, AIL/ACDC

4 Response to Mandate

Recommending Arctic Research Policy and Priorities

Policy

The Arctic Research and Policy Act directs the Commission to develop and recommend an integrated national arctic research policy and to publish annually a statement of research goals and objectives to assist the work of the Interagency Arctic Research Policy Committee in preparing a research plan to implement arctic policy. These responsibilities were a primary concern during the first months of the Commission's existence, especially during the public meetings it held in Alaska in June 1985.

By September 1985, the Commission had developed some draft statements of policy that, together with a draft provided by the Interagency Committee in April 1985, constituted the background of a preliminary Commission definition of research policy and objectives. The draft was further modified during fall 1985, and the revised version was unanimously approved at the Commission's November 1985 meeting. The policy statement was then transmitted to the Interagency Committee, and to the governor of Alaska. In addition, the Interagency Committee adopted the Commission's statement of arctic goals and objectives as the basis for development of a five-year research program plan for the Arctic. The Commission's statement follows below.

The Interagency Committee, after making a few additional revisions, used the Commission statement of arctic research policy.

U.S. Arctic Research Policy

It is in the national interest of the United States to support scientific and engineering research in all pertinent fields to implement its national policy of protecting essential security interests in the Arctic, promoting rational development in the arctic region while minimizing adverse environmental effects, and contributing to the knowledge of the arctic environment or of aspects of science that are most advantageously studied in the Arctic.

It shall be the U.S. Arctic Policy to:

1. Further coordinate federal efforts with those of state and local governments.
2. Provide that the Arctic Research Plan formulated under the Arctic Research Policy will:
   - A. Be responsive to national needs and interests and to the needs and concerns of the federal government, the residents of the U.S. Arctic, and the industrial and scientific community;
   - B. Take into account such unique features and challenges of the Arctic as:
     - (1) The strategic location of Alaska, in particular, and of the Arctic in general;
     - (2) The natural resource potential of the Arctic;
     - (3) The susceptibility of the arctic environment to human-induced degradation;
     - (4) The culture and health of arctic residents, and the effects of economic and technological changes on their lifestyle and well-being.
3. Promote international cooperation in arctic research of mutual interest.

U.S. Goals and Objectives in Arctic Research

Arctic research supported by the United States under its Arctic Research Policy shall be aimed at resolving scientific and technological problems of the physical and biological components of

the Arctic and the interactive processes that govern the behavior of these components. The objectives will include, but not be limited to, addressing the needs for increased knowledge in such issues as: the Arctic as a natural laboratory, national defense, natural hazards, global climate and weather, energy and minerals, transportation, communications, renewable resources, pollution, environmental protection, health and adaptation, and Native cultures.

To achieve these goals and objectives,

1. A long-range research plan will be developed, including the identification and recommendation of priorities related to arctic research problems and programs.
2. Implementation of the plan will include promoting research support activities such as:
   A. Establishment of an arctic data and information system;
   B. Collection and long-term monitoring of baseline data on the arctic environment;
   C. Provision of adequate logistic support systems and facilities.

Priorities

Throughout its deliberations on arctic research policy, the Commission had also been considering research needs and ways to arrive at setting priorities. The approach it adopted was to view the Arctic as a large-scale natural system made up of strongly interacting components. Understanding the processes and interrelationships within the system would provide the key for solution of problems arising in the Arctic, such as those related to resource development and environmental protection, health, communications, transportation, weather, and ice conditions on land and at sea, as well as broader problems of climate, air pollution, and marine ecosystems. The Commission concluded that:

The basic premise for an Arctic Research Plan should be development of a comprehensive, interdisciplinary, coordinated approach to the acquisition of the scientific and engineering knowledge required to respond to national needs in the Arctic, including national security and defense, resource development protection of the environment, and the well-being of the population.

Even fire fighting in the Arctic poses unusual problems. In temperatures below zero, water flow and pressure are difficult to maintain, and fire fighters are often chilled or frostbitten by water spray.

C. D. Evans, AEIDC

The Commission emphasized the need for both basic and applied research—to advance fundamental knowledge and at the same time to better understand and deal with immediate problems. In setting priorities it found that, in addition to national need, the ability to predict (be it weather, effects of drilling operations, or air pollution on an ecosystem, or whatever) is a useful criterion.

Another consideration was making use of the natural laboratory the Arctic provides for research on phenomena and processes that have impact far beyond that region. Research on health; natural hazards such as earthquakes and volcanism; frozen ground; and human, plant, and animal adaptations to extreme cold and long period of darkness—these kinds of research and much more for which the Arctic is well-suited—have widespread applications.

The Commission published its rationale for arctic research planning and priorities in *National Needs and Arctic Research: A Framework for Action*. Prior to publication (May 1986), the manuscript was transmitted to the Interagency Committee and other groups and individuals concerned with arctic research to assist in their planning. The report takes the Commission's statement of policy and objectives a step further, providing a conceptual framework and priorities. It recommends the following programs of research in order of priority:

Research to understand the Arctic Ocean (including the Bering and marginal seas, sea ice, and seabed), and how the ocean and the arctic atmosphere operate as coupled components of the arctic system.

Emphasis should be on gaining the knowledge needed to advance:

- Discovery and development of nonrenewable resources with minimum adverse environmental impact;
- Prediction of ecosystem reactions to natural and human-induced disturbances;
- Forecasting of arctic weather and its impacts on global weather patterns;
- Prediction of climatic change related to change in concentrations of atmospheric gases such as carbon dioxide;
- Prediction of sea ice and other maritime conditions and hazards.

Research to understand the coupled land and atmosphere components of the arctic system.

Emphasis should be on gaining the knowledge needed to advance:

- Discovery and development of terrestrial nonrenewable resources with minimum adverse environmental impact;
- Prediction of ecosystem reactions to natural and human-induced disturbances;
- Forecasting of arctic weather;
- Understanding of the history of climatic change as revealed in ice sheets, permafrost, sediments, and fossils.

Research to understand the high-latitude upper atmosphere and its extension into the magnetosphere.

Emphasis should be on advancing prediction of disturbances in space and mitigating their effects on high-latitude communication and defense systems.

Further, although the high-priority research the Commission recommended is directly related to arctic health, culture, and socioeconomic conditions, there is an urgent and ongoing need for research directed specifically to the health of arctic inhabitants and their adaptation to arctic conditions, as well as to the effects of resource development and industrial growth on arctic residents. Such research is the highest priority from the regional standpoint, but its implications and applications

Improved data systems and networks are vital to effective future planning.

transcend regional boundaries; they are of national as well as international significance. Therefore, the Commission recommends as highest priority for the human component of the arctic system:

> **Research to identify and resolve the major health, behavioral, and cultural problems that derive from the distinctive character of the arctic environment and from increasing resource development, industrialization, and urbanization.**

In addition to priorities for research, the report also addressed problems of data handling, logistic support, and cooperation in research, including international cooperation. All of these matters received attention during FY 1986 and are treated in the following sections of this annual report.

Cooperation with the Interagency Committee

The charge, under the Arctic Research and Policy Act, to cooperate with the Interagency Committee in developing a national arctic research program plan to implement arctic research policy and to advise and assist the Interagency Committee on matters related to arctic research policy and planning implies a close and complementary working relationship between the Commission and the Interagency Committee. Such a relationship has existed from the outset and continues. Each is represented at the meetings of the other; each keeps the other informed about its activities; each circulates to the other policy and planning documents from early draft through the final prepublication stage to obtain suggestions and reactions and to assist each other's work.

The Commission's statement of arctic research policy and its report on priorities (presented in the preceding section) were among the major inputs to the Interagency Committee as it began development of an arctic research plan. This plan has been the main focus of the Interagency Committee's work during the past fiscal year, and the Commission has cooperated in this effort.

The Interagency Committee organized a series of workshops to develop a set of research plans that would build upon and supplement existing agency programs in the following fields: arctic weather and ice dynamics, arctic marine ecosystems, energy and minerals, arctic land-based environments and cultural resources, and arctic health. The documents resulting from these workshops, together with nine Interagency Committee recommendations and the Commission's report *National Needs and Arctic Research: A Framework for Action* formed the content of "Federal Arctic Research: Draft Recommendations for Necessary Programs" (July 1986). This draft and the descriptions of agency programs in *Federal Arctic Research: Detailed Listing of Existing U.S. Programs* (September 1985) provide the components of a national arctic research plan. The "Draft Recommendations for Necessary Programs" was circulated to the Commission and other organizations such as the National Research Council's Polar Research Board for comment. The Commission transmitted the document to its group of advisors and provided the Interagency Committee with copies of the responses. It also began preparation of an analysis titled "Comparison of the Arctic Research Commission's Recommended Priorities with the Interagency Arctic Research Policy Committee's Draft Five-Year

Arctic Research Plan." This draft document not only compares the "Recommendations for Necessary Programs" with the Commission's recommendations, but attempts to show the relationship of what is recommended to the existing agency programs in the ...*Detailed Listing*... and the relative level of activity and funding in various interdisciplinary fields of research: geology/earth sciences (including climate); oceanography (including sea ice); biology/ecology—marine, terrestrial, and combined marine/terrestrial; arctic engineering; and medicine/health and socioculture. The draft analysis was transmitted to the Interagency Committee in October 1986.

The Interagency Committee scheduled a workshop for mid-November 1986 in Anchorage, Alaska to provide for further input to, and discussion of, the draft plan. Members of the commission and some of its group of advisors will observe this working session. The Commission will also review the revised draft that results from the November session.

Through ongoing interaction, recommendations on research policy and research needs, and the provision of information on the views of the scientific and engineering communities and of Alaska residents, the Commission assists the Interagency Committee and will continue to work with it toward development of an effective national five-year plan for arctic research.

Federal/State Cooperation

To meet its mandate to foster federal and state cooperation in arctic research and to work with the governor of Alaska and his designates, the Commission opened an office in Anchorage in January 1986 and scheduled two of its FY 1986 meetings in Alaska. One of these, held in April, included public sessions and site visits (see "Outreach"), and the other took place at the State Capitol in Juneau on January 31, 1986.

During this meeting the Commission met with the governor, members of his cabinet, the state legislature, and the Senate and House Committee on Resources. The Governor of Alaska summarized the state's goals in arctic research, announced that the legislature would be asked to enact legislation establishing an Alaska research policy (which was subsequently approved and signed into law on May 24, 1986; see Appendix D), and indicated that he had appointed a Science and Engineering Advisory Committee, with his science advisor as chairman, to coordinate state agency research with that of industrial and academic institutions. He commended the Commission on opening an office in Anchorage and said that he would seek funds from the legislature to assist in support of this office.

In closing, Governor Sheffield stated, "It has been clearly demonstrated from experience in federal and private research that there is substantial pay-off from scientific and engineering research. The State of Alaska therefore confirms again its commitment to science and engineering research efforts within the state to help understand phenomena, solve its problems, develop its economy, and improve the

The Alaska legislature enacted an Alaska research policy in May of 1986.

quality of life of its citizens." The Alaska Science Policy, later enacted into law, is an expression of this commitment. The governor also recommended three areas for federal/state cooperation: health, fisheries, and information systems.

The Commission chairman, in his address to the a joint session of the Senate and House Committee on Resources, emphasized the importance, not only to the state but to the nation, of (a) the fisheries of the Bering Sea, (b) the health and welfare of those who live and work in the Arctic, and (c) an effective arctic information network. It was agreed in discussions that followed that joint federal/state task forces should be established to develop cooperative research agendas in fisheries research and health. To this end, letters signed by the governor and the Commission chairman were sent to Dr. Anthony Calio (Administrator, NOAA) and the Honorable Donald Collinsworth (Commissioner, Alaska Department of Fish & Game), and to Dr. Donald MacDonald (Assistant Secretary of Health, Department of Health & Human Services), and the Honorable John Pugh (Commissioner, Alaska Department of Health & Social Services), in which the creation of joint federal/state task forces to identify specific research needs and to recommend priorities for federal/state cooperative research programs in fisheries and health, respectively, were proposed.

These groups were subsequently organized and began their work. The one on health reported its plans to the Commission in July. It scheduled a meeting in September during the meeting of the American Public Health Association. In regard to fisheries research, a number of the local fishermen who participated in the Kodiak public meeting held by the Commission expressed their concurrence on the need for ecosystem research to understand factors affecting variations in fish stocks and agreed to provide ship and crew time to support the research effort. In the approximately one-year interval before a detailed research plan could be developed and implemented, continuance of the NOAA surveys in the Bering Sea would be necessary to ensure the accumulation of the baseline data that are needed to manage fisheries. Consequently, the projected FY 1987 budget reduction from $8,685,000 to $4,671,000 for fisheries research in the Bering Sea was a cause of great concern. The Commission chairman wrote to the President, to Senators Stevens and Murkowski, and Congressmen Young and Fuqua, pointing out the economic importance of the Bering Sea fisheries—40 percent of the total U.S. annual fish harvest from U.S. waters, an annual revenue of some $2 billion, and employment of some 50,000 people—and urged restoration of the $4,014,000 cut. He called attention also to the high priority accorded by the commission to marine ecosystem research and the exceptional opportunities it offers for federal, state, industrial, and university cooperation in research that is vital to U.S. interests.

In regard to data handling and information systems, the Commission and the Alaska state government are aware of the federal/state interagency Committee for Natural Resource Information Management (CONRIM). Because an organization already exists to foster joint federal/state objectives and to develop an agreement for the formal establishment and operation of an arctic and Alaskan natural resource, science, and technology information transfer network, the governor and the Commission chairman, as a first step toward solution of the information problem, sent a letter encouraging the CONRIM effort, offering assistance as needed, and suggesting issues that the interagency operational agreement should specifically address. These included identification of (a) information management and transfer objectives to be achieved through organizational cooperation, (b) specific organizational responsibilities consistent with existing law and mandates, and (c) organizational representation and administrative relationships. They further urged a realistic approach, tied closely to funding levels, in setting

long-range goals and estimating the time required to attain them, and they suggested coordination with the Arctic Environmental Information and Data Center's project titled "Arctic Information Network Design and Plan."

Logistic Planning and Support

The Commission's mandate calls for recommendations to improve logistic support for arctic research. Because the Commission's highest research priority was research to understand the Arctic Ocean and the way that the ocean and atmosphere operate as coupled systems, its initial focus has been on logistic support and facilities for ocean research. The Commission chairman met with the Commandant, U.S. Coast Guard, to discuss ways to maximize the use of icebreakers in the best interest of the United States and the U.S. scientific community. Admiral Paul Yost, Commandant, stated that support of scientific activities on icebreakers has received higher priority since the "polar" class icebreakers were designed and constructed.

The Coast Guard Academy includes the support of science among the responsibilities in which it instructs officers, and it will continue to emphasize to its officers that science support is a part of the Coast Guard's overall mission. The Coast Guard hopes to include a new icebreaker in the FY 1988 budget request. National defense and science support provide the justification for the new ship, and the ship would have improved science support capability.

Because the Commission's highest research priority was research to understand the Arctic Ocean, . . . one initial focus has been on logistic support and facilities for ocean research.

The Coast Guard Authorization Act of 1984 (P.L. 98-557) called for the preparation of design and construction plans for at least two polar capable icebreakers to be operational during FY 1990. The House of Representatives has requested a procurement schedule for the proposed new icebreakers. In a May 1986 letter responding to this request, Secretary of Transportation Elizabeth Dole indicated that conceptual design had been completed and was being reviewed by the Polar Icebreaker User Council. Their comments would be incorporated in the preliminary design stage, which was already in progress. She stated that although a contract could be awarded by mid FY 1989, the goal of having the new class of polar icebreakers operational by FY 1990 was not attainable, as approximately four years would be required for construction. Therefore, FY 1993 would be a more likely date for the first new polar icebreaker, with a second vessel fully operational in FY 1994.

The Commission noted these developments as well as the recent finding that the U.S. Coast Guard icebreaker *Glacier* was no longer capable of breaking ice. Thus the support of research in ice-covered seas is in a crisis situation. The cost of upgrading *Glacier* and of the proposed new icebreakers suggests exploration of other arrangements such as refitting *Glacier* and seeking only one new icebreaker, or considering lease/purchase arrangements for ice-worthy ships. In a meeting with, and subsequent letter to, the Director of the National Science Foundation (NSF), the Commission chairman urged the foundation to investigate the possibility of lease/

purchase, as an important first step that is critical for arctic as well as antarctic research.

The Commission has also considered the findings of a Polar Research Board working group that surveyed about 100 scientists who had conducted research from U.S. Coast Guard icebreakers and were generally dissatisfied with the operations of the icebreakers in support of science. In a meeting held in October 1985 at the National Science Foundation at which representatives of the Polar Research Board, Navy, Coast Guard, NSF, and the Commission were present, this problem was explored and the Coast Guard representatives proposed some ways to improve future interaction about science needs on icebreakers and procedures for resolving problems.

In addition to studying needs and problems related to scientific research on icebreaking vessels, the Commission suggested informally to the Interagency Committee that a study to assess current arctic research platforms (that is, bases, ships, satellites, buoys, aircraft, balloons, and the like) and logistic systems would be timely. The Interagency Committee indicated that the working groups for various parts of the draft five-year arctic research plan were giving attention to logistic needs and that they would prefer to wait until these findings and recommendations had been received.

The Commission then decided to hold a separate logistic workshop concurrently with the five-year research plan workshop scheduled by the Interagency Committee for November 1986. The logistic workshop will be a preliminary, introductory one to better acquaint Commission members and others who are interested with the present capabilities. Presentations will deal with vessels, satellite systems, terrestrial systems, buoys, and coordination and management. Through this workshop and follow-up activities, the Commission hopes to define logistic needs for arctic research, the degree to which these needs are or can be met, and what should be done to satisfy unmet requirements. It will issue a report on the November workshop.

Information Handling

The act directs the Commission to recommend ways to improve the management of arctic research information and data. As mentioned in the section on "Federal/State Cooperation," both the Commission and the governor of Alaska identified data handling and information systems as one of the top priorities for federal/state cooperation. As a federal/state group had already been created to develop a more efficient information handling network and to define agency responsibilities in this system, both the Commission and the State of Alaska have encouraged the Committee on Natural Resource Information Management (CONRIM) in its work.

By locating its Alaska office at the Arctic Environmental Information and Data Center (AEIDC), the Commission hopes to maintain awareness of new initiatives and of problems related to information handling.

Early in FY 1986, some Commission members met with the president of the Arctic Oil and Gas Association (AOGA) to discuss ways to expedite public awareness of and access to nonproprietary reports and data. The association has now made arrangements with AEIDC to transfer some specific reports and some data to the public domain.

In reviewing the research programs included in the Interagency Committee's preliminary draft of the five-year arctic research plan, the Commission noted

general concern about the management of data and information. It suggested that there be some effort to include programs of arctic research, and later budget requests associated with them, adequate provision for making the research findings easily accessible and fostering their use.

Coordination of Federal Arctic Research Programs

The Commission considered carefully the survey of federal agency arctic research programs published by the Interagency Committee in September 1985, and in FY 1986 it began a review of various fields of research, beginning with the two identified as high priorities for federal/state cooperation—fisheries and health. When the five-year plan for arctic research has been fully developed, the Commission can better review agency activities and recommend ways to strengthen interagency cooperation and coordination in relation to the plan. Therefore, most of the Commission's work on this aspect of its mandate lies ahead; at this stage it is gathering the information that will guide its recommendations.

Humans have occupied the Aleutian Islands for nearly 10,000 years. Cultural anthropology and archeology, along with related natural science, can contribute to documenting the adaptations, developments and complexities of Aleutian social history.

D. W. Veltre, ACC

5 Other Concerns

The "mutually beneficial" international cooperation stated in the Arctic Policy Act is a growing need.

International Cooperation

Repeatedly, statements of arctic policy, descriptions of arctic research needs, and discussions of research opportunities in the Arctic emphasize the importance—indeed, the necessity—of international cooperation. The implication is clear that something is lacking in this regard, though there are many examples of productive cooperation, such as that between Denmark Switzerland, and the United States in the Greenland Ice Sheet Program.

Also, there is no absence of bilateral and multilateral, governmental and nongovernmental cooperative agreements, nor a dearth of international organizations concerned in whole or in part with arctic scientific research. The Commission compiled a catalogue of "Arctic Cooperative Research Agreements and Major Arctic-rim Research Organizations" in April 1986 as background for Commission deliberations. Although it does not purport to be complete, it lists 19 bilateral and 6 multilateral U.S. agreements in scientific research; 5 bilateral and 5 multinational non-U.S. agreements; 18 bilateral and 19 multinational nongovernmental scientific research organizations or programs concerned with the Arctic; and 140 domestic research organizations in various countries that conduct arctic research and often enter into cooperative research arrangements. Of the latter organizations, 53 are in the United States.

Currently, the Interagency Committee and Commission, through the Department of State, have asked nations conducting arctic research information on the scope and level of activity of their programs; information on how arctic science is planned, organized, and funded; and identification of research centers planning or conducting arctic research.

Yet concern about international cooperation in arctic research not only continues but grows. Some suggest the need for a cooperative research organization comparable to the Scientific Committee on Antarctic Research (SCAR). But there is no treaty in the North comparable to the Antarctic Treaty which makes a unified approach to Antarctic research possible. The Arctic is a geopolitically sensitive region that falls within the national boundaries of a number of nations, and other countries not on the Arctic Rim, such as the United Kingdom, Switzerland, West Germany, Poland, France, Japan and Italy, also have arctic interests.

To explore ways of achieving more effective cooperation in arctic research, the Commission chairman held a small meeting of key representatives from a number of countries interested in arctic research who were attending a SCAR meeting in July

1986. Countries represented at this session were the Federal Republic of Germany, Finland, France, Japan, Norway, Poland, the Soviet Union, Sweden, the United Kingdom, and the United States.

The meeting participants reviewed the work of some current organizations, noting needs not met by current arrangements. The Commission chairman put forward the idea of a forum at which common arctic research issues could be discussed. Several participants agreed that there was need for such a forum, particularly for discussion of research on environmental problems. There was consensus that a meeting to explore interest in establishing such a forum would be worth pursuing. The meeting could be held in a non-NATO, non-Warsaw Pact country and under such sponsorship (for example, the International Council of Scientific Unions) as to permit U.S.S.R. participation. The representative from Norway agreed to take the lead in interacting with the Soviet Union about participation, and an ad hoc group from Arctic-rim countries was formed to organize a planning session early in 1987.

In proceeding with arrangements for the planning session, Odd Rogne (Director, Norsk Polarinstitutt), the representative from Norway, invited ideas about the need for a forum and its possible organizational structure. One respondent urged a careful review of the objectives of existing organizations that foster cooperation in arctic research, the reasons that they have not been able to fully realize their objectives, the constraints on cooperation in arctic research—that is, the very sensitive national and political issues that are inevitably involved—and what a new organization would change or do differently. A key question is at what level of science or management the proposed organization would operate. There are both advantages and disadvantages associated with various governmental levels of coope: tion and with nongovernmental cooperative agreements.

The Commission will give thought to these matters and it will participate in the planning session and the larger forum when and if that is organized. Either in a special report or in its annual report for FY 1987, it will offer recommendations on U.S. cooperation in arctic research.

There is but limited recognition as yet to the crucial role of the Arctic in national security and economic well-being.

The United States as an Arctic Nation

Presidential memoranda on policy, Congressional acts, the programs and plans of federal agencies and private organizations—all these provide a rationale and a foundation for arctic research. But the key ingredients in building arctic research to the needed level are public awareness and support. We have a framework for action, and the development of a national five-year plan for arctic research is progressing. The Interagency Committee expects to submit the five-year plan to the President and the Congress by July 1987, with biennial updating thereafter. Implementation of that plan and the required level of support for it rest in no small measure on public recognition of the nation's interests in the Arctic—economic, military, medical, environmental, and international.

A few examples will illustrate the potential impacts of arctic research. The U.S. Arctic is one of the richest commercial fisheries in the world, and one of this country's greatest commercial assets. The biologically productive seasonal ice zone of the Bering and Chukchi seas is about the same size as the major grain-producing regions of the U.S. farm belt, that is, an area comparable to that extending from the Rockies to the Mississippi River and from the Canadian border to Texas. Among its products are king crab and other shellfish, salmon, and pollock and yellowfin sole; the latter are particularly important to the production of minced, artificially-flavored fish products—a new (in the United States) and growing industry. The relationship of fluctuations in fish and shellfish populations and in marine mammal and bird populations to the interannual variation of maximum ice extent and seasonal ice retreat is a recommended focus for research to ensure continuing biological productivity of the Bering and Chukchi seas and effective management of this tremendous economic resource, which amounts to billions of dollars annually and provides thousands of jobs.

In regard to fish production and consumption, there are some exciting medical findings. For example, the low incidence of coronary heart disease among Eskimos has been linked to certain polyunsaturated fatty acids in the cold water fish and marine mammals that constitute a substantial portion of Eskimo diets. This finding has led to the development of a new commercial nondrug product, *Promega*—a natural fish oil concentrate marketed by Parke-Davis—which has been suggested as an adjunct to dietary intervention for patients at early risk of heart disease. As the federal/state task group on health research initiatives in the Arctic pointed out in a preliminary report to the Commission, the beneficial consequences to the United States (and other countries) could be immense if increased consumption of a renewable resource such as salmon would reduce the incidence of atherosclerosis and heart disease. Such a possibility is well worth exploring.

The Arctic has much else to contribute through health research—not just to the United States but worldwide. For example, comparisons of trends in cancer types and incidence among various arctic Native populations, and between these uniquely homogeneous populations and others, could tell us much about genetic and other factors in cancer. Some viral-associated cancers occur more frequently among arctic Native residents than among other groups; research to understand these viruses would not only benefit the arctic Natives who are most affected but would have far-reaching implications.

Another potentially highly beneficial field of health research in the U.S. Arctic is injury—the principal public health problem in the United States and one that is particularly acute in the U.S. Arctic. In Alaska injuries are the leading cause of death for all age groups, accounting for 37 percent of all deaths among Natives and 29 percent of all deaths among non-Natives. Alaska's population is young; 89 percent of the inhabitants are under 50 years of age. Of deaths among Alaskans less than 50, injury accounts for nearly three-fourths (70%). Development of comprehensive data bases on occurrence of injury could help to focus efforts on high-risk factors, and the findings could be broadly applied. Further, improved data systems for injury research and amelioration could be used to strengthen the health data systems in other states and to foster cooperation in health research.

Improved systems and networks for the handling of data—not just on arctic health but on the arctic environment and resources—are vital to many U.S. activities and to effective future planning. The Council on Northern Resources Information Management (a reorganization of the former Committee on Natural Resources

Information Management) (CONRIM) is working toward more effective procedures for the collection and transfer of information and data. It is giving special attention to the needs outlined in the five-year arctic research plan, as well as to those associated with national security.

Although the most persuasive and attention-demanding arguments for arctic awareness are those associated with health, national defense, resource exploitation, and environment, there are other aspects of the Arctic that capture the imagination and interest of many people. The Commission notes the value of such activities as the 1982 exhibition "Inua. Spirit world of the Bering Sea Eskimo," organized by the Smithsonian Institution and accompanied by an excellent catalogue, and the opening, on November 15, 1986, of a new permanent exhibition of the extensive Alaskan collections of the University of Pennsylvania's Museum World of Alaska's Native People; "the exhibition depicts the 19th and 20th century cultures of three Alaskan Native groups that live on the northwest coastal tundra and of two Indian groups, the Athapaskans and the Tlingit." The museum "hopes to increase the public's awareness and understanding of Native Alaskan cultures...and to provide Native Alaskans with increased access to information about their cultural and artistic heritage." [*Archaeology*, 39, November/December 1986, p. 55]. Such efforts should be encouraged and well-publicized.

The challenge—the imperative—in FY 1987 is to stimulate public awareness of the United States as an arctic nation, for on this awareness depends our future national well-being and our role in international cooperative endeavors in the Arctic. As the Commission chairman indicated in a recent address in Anchorage, Alaska, "The overall importance of the Arctic has been severely underplayed; it is time Americans started paying attention to this research-rich environment." The U.S. Arctic holds the keys to solution of many of the greatest problems that face the United States now and in the 21st century. The Commission is giving thought to what it can do to foster the needed recognition of this fact. That goal will be a main emphasis in its work during FY 1987.

Eskimos pulling a umiak (skin boat) over the ice. Earl Rousman, University of Alaska Archives

6 Looking Ahead

The Commission will continue to meet approximately quarterly and to hold at least one of its meetings each year in Alaska. In particular, it plans to meet at least every other year with the governor and legislature of Alaska, and to propose additional fields for federal and state cooperation. When the federal/state task forces, working to develop cooperative research programs in fisheries and health, complete their reports, the Commission will assist as needed in efforts to implement the proposed research. It will continue to hold public sessions, and as mandated by the Arctic Research and Policy Act, it will update statements on research policy and objectives that reflect the information it receives.

A main focus of work during FY 1987 is the five-year plan for a national program of arctic research.

A main focus of work during FY 1987 is the five-year plan for a national program of arctic research. The Commission will continue to assist the Interagency Committee in developing a comprehensive research agenda that is responsive not only to national and state needs but takes advantage of the exceptional research opportunities that the Arctic offers. As already noted, once the plan is in place, the Commission will explore, in more detail, ways to improve federal agency coordination in support of the proposed research.

The Commission will continue the review of logistic support systems and needs that began with its November 1986 workshop in Anchorage. It expects to issue a report and recommendations in this area during FY 1987. It will also continue to monitor data and information activities—in particular, the work of the Committee on Natural Resource Information Management and the Arctic Environmental Information and Data Center.

At the close of FY 1986, the future of the Arctic Coastal Plain Province of the Arctic National Wildlife Refuge was once again becoming an issue of concern to federal, state, local, and private organizations. The Department of the Interior was drafting a recommendation to Congress that would permit leasing on 1.55 million acres of the Arctic Coastal Plain area for oil and gas exploration and development. Geologic studies suggest that this area could contain more than 4.8 billion barrels of oil and 11.5 trillion cubic feet of gas in place. State and local groups and environmental organizations point to the likely impact of such development on caribou migration patterns; on other mammals, fish, and birds; and on the inhabitants of the only village in the area. The Commission has no power to adjudicate or resolve the dispute, but what it can do is ensure that the findings of research (or needs for further research) are brought to the attention of decision-makers as a basis for whatever action they take.

Another main emphasis in the Commission's work during FY 1987 will be international cooperation in arctic research. It will participate in the planning session held by Arctic-rim nations early in 1987 to consider the needs for possible structure of an international forum for discussion of issues related to arctic research, and it will work to bring this organization into being if there is consensus on the need for it. With the World Climate Research Program taking shape, the Commission will consider the role and opportunities for arctic research in these large international research efforts and will work to promote such opportunities.

The Arctic Research and Policy Act gave legislative recognition to arctic research as vital to the U.S. national interest and economic well-being. It reaffirmed previous statements of U.S. policy in the Arctic and defined more fully their implications. In so doing, it gave new status and incentive to what has been a fragmented, uneven effort and provided an opportunity to achieve a new level of interdisciplinary, interorganizational, and international cooperation in arctic research: the act also furthered cost-effectiveness and productivity in research, and more rapid application of research findings to national and regional needs.

To realize these goals requires strong public interest and support. Therefore, one of the highest priorities for the Commission in FY 1987 is to foster an awareness among the U.S. public and its leaders that we are entering "the Age of the Arctic" and that the United States is an arctic nation having national and international imperatives.

Protection of antiquities from destruction by various types of developments or natural processes should be matched by adequate support for analyzing and studying newly collected materials.

Anchorage Museum of History and Art

Appendix A:
The Arctic Research and Policy Act of 1984

Public Law 98-373
98th Congress

An Act

July 31, 1984
[S. 373]

To provide for a comprehensive national policy dealing with national research needs and objectives in the Arctic, for a National Critical Materials Council, for development of a continuing and comprehensive national materials policy, for programs necessary to carry out that policy, including Federal programs of advanced materials research and technology, and for innovation in basic materials industries, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

Arctic Research and Policy Act of 1984

TITLE I—ARCTIC RESEARCH AND POLICY

SHORT TITLE

15 USC 4101 note

SEC. 101. This title may be cited as the "Arctic Research and Policy Act of 1984".

FINDINGS AND PURPOSES

15 USC 4101.

SEC. 102. (a) The Congress finds and declares that—

(1) the Arctic, onshore and offshore, contains vital energy resources that can reduce the Nation's dependence on foreign oil and improve the national balance of payments;

(2) as the Nation's only common border with the Soviet Union, the Arctic is critical to national defense;

(3) the renewable resources of the Arctic, specifically fish and other seafood, represent one of the Nation's greatest commercial assets;

(4) Arctic conditions directly affect global weather patterns and must be understood in order to promote better agricultural management throughout the United States;

(5) industrial pollution not originating in the Arctic region collects in the polar air mass, has the potential to disrupt global weather patterns, and must be controlled through international cooperation and consultation;

(6) the Arctic is a natural laboratory for research into human health and adaptation, physical and psychological, to climates of extreme cold and isolation and may provide information crucial for future defense needs;

(7) atmospheric conditions peculiar to the Arctic make the Arctic a uni[illegible]ring ground for research into high latitude communicati[illegible]ch is likely to be crucial for future defense needs;

(8) Arctic mar[illegible]ology is critical to cost-effective recovery and transport[illegible] energy resources and to the national defense;

(9) the United State[illegible]s important security, economic, and environmental interests [illegible] developing and maintaining a fleet of icebreaking vessels [illegible]pable of operating effectively in the heavy ice regions of the A[illegible]ctic;

98 STAT. 1243

(10) most Arctic-rim co[illegible]ntries, particularly the Soviet Union, possess Arctic technologie[illegible] far more advanced than those currently available in the United States;

(11) Federal Arctic research is fragmented and uncoordinated at the present time, leading to the neglect of certain areas of research and to unnecessary duplication of effort in other areas of research;

(12) improved logistical coordination and support for Arctic research and better dissemination of research data and information is necessary to increase the efficiency and utility of national Arctic research efforts;

(13) a comprehensive national policy and program plan to organize and fund currently neglected scientific research with respect to the Arctic is necessary to fulfill national objectives in Arctic research;

(14) the Federal Government, in cooperation with State and local governments, should focus its efforts on the collection and characterization of basic data related to biological, materials, geophysical, social, and behavioral phenomena in the Arctic;

(15) research into the long-range health, environmental, and social effects of development in the Arctic is necessary to mitigate the adverse consequences of that development to the land and its residents;

(16) Arctic research expands knowledge of the Arctic, which can enhance the lives of Arctic residents, increase opportunities for international cooperation among Arctic-rim countries, and facilitate the formulation of national policy for the Arctic; and

(17) the Alaskan Arctic provides an essential habitat for marine mammals, migratory waterfowl, and other forms of wildlife which are important to the Nation and which are essential to Arctic residents.

(b) The purposes of this title are—

(1) to establish national policy, priorities, and goals and to provide a Federal program plan for basic and applied scientific research with respect to the Arctic, including natural resources and materials, physical, biological and health sciences, and social and behavioral sciences;

(2) to establish an Arctic Research Commission to promote Arctic research and to recommend Arctic research policy;

(3) to designate the National Science Foundation as the lead agency responsible for implementing Arctic research policy; and

(4) to establish an Interagency Arctic Research Policy Committee to develop a national Arctic research policy and a five year plan to implement that policy.

ARCTIC RESEARCH COMMISSION

SEC. 103. (a) The President shall establish an Arctic Research Commission (hereafter referred to as the "Commission"). Establishment. 15 USC 4102.

(b)(1) The Commission shall be composed of five members appointed by the President, with the Director of the National Science Foundation serving as a nonvoting, ex officio member. The members appointed by the President shall include—

(A) three members appointed from among individuals from academic or other research institutions with expertise in areas of research relating to the Arctic, including the physical, biological, health, environmental, social, and behavioral sciences;

(B) one member appointed from among indigenous residents of the Arctic who are representative of the needs and interests of Arctic residents and who live in areas directly affected by Arctic resource development; and

(C) one member appointed from among individuals familiar with the Arctic and representative of the needs and interests of private industry undertaking resource development in the Arctic.

98 STAT. 1244

(2) The President shall designate one of the appointed members of the Commission to be chairperson of the Commission.

(c)(1) Except as provided in paragraph (2) of this subsection, the term of office of each member of the Commission appointed under subsection (b)(1) shall be four years.

(2) Of the members of the Commission originally appointed under subsection (b)(1)—

(A) one shall be appointed for a term of two years;

(B) two shall be appointed for a term of three years; and

(C) two shall be appointed for a term of four years.

(3) Any vacancy occurring in the membership of the Commission shall be filled, after notice of the vacancy is published in the Federal Register, in the manner provided by the preceding provisions of this section, for the remainder of the unexpired term.

(4) A member may serve after the expiration of the member's term of office until the President appoints a successor.

(5) A member may serve consecutive terms beyond the member's original appointment.

(d)(1) Members of the Commission may be allowed travel expenses, including per diem in lieu of subsistence, as authorized by section 5703 of title 5, United States Code. A member of the Commission not presently employed for compensation shall be compensated at a rate equal to the daily equivalent of the rate for GS-16 of the General Schedule under section 5332 of title 5, United States Code, for each day the member is engaged in the actual performance of his duties as a member of the Commission, not to exceed 90 days of service each year. Except for the purposes of chapter 81 of title 5 (relating to compensation for work injuries) and chapter 171 of title 28 (relating to tort claims), a member of the Commission shall not be considered an employee of the United States for any purpose. 5 USC 8101 *et seq.* 28 USC 2671 *et seq.*

(2) The Commission shall meet at the call of its Chairman or a majority of its members.

(3) Each Federal agency referred to in section 107(b) may designate a representative to participate as an observer with the Commission. These representatives shall report to and advise the Commission on the activities relating to Arctic research of their agencies.

Public meeting

(4) The Commission shall conduct at least one public meeting in the State of Alaska annually.

DUTIES OF COMMISSION

15 USC 4103

SEC. 104. (a) The Commission shall—

(1) develop and recommend an integrated national Arctic research policy;

(2) in cooperation with the Interagency Arctic Research Policy Committee established under section 107, assist in establishing a national Arctic research program plan to implement the Arctic research policy;

98 STAT. 1245

(3) facilitate cooperation between the Federal Government and State and local governments with respect to Arctic research;

(4) review Federal research programs in the Arctic and suggest improvements in coordination among programs;

(5) recommend methods to improve logistical planning and support for Arctic research as may be appropriate and in accordance with the findings and purposes of this title;

(6) suggest methods for improving efficient sharing and dissemination of data and information on the Arctic among interested public and private institutions;

(7) offer other recommendations and advice to the Interagency Committee established under section 107 as it may find appropriate; and

(8) cooperate with the Governor of the State of Alaska and with agencies and organizations of that State which the Governor may designate with respect to the formulation of Arctic research policy.

(b) Not later than January 31 of each year, the Commission shall—

(1) publish a statement of goals and objectives with respect to Arctic research to guide the Interagency Committee established under section 107 in the performance of its duties; and

Report

(2) submit to the President and to the Congress a report describing the activities and accomplishments of the Commission during the immediately preceding fiscal year.

COOPERATION WITH THE COMMISSION

15 USC 4104

SEC. 105. (a)(1) The Commission may acquire from the head of any Federal agency unclassified data, reports, and other nonproprietary information with respect to Arctic research in the possession of the agency which the Commission considers useful in the discharge of its duties.

Confidentiality

(2) Each agency shall cooperate with the Commission and furnish all data, reports, and other information requested by the Commission to the extent permitted by law; except that no agency need furnish any information which it is permitted to withhold under section 552 of title 5, United States Code.

(b) With the consent of the appropriate agency head, the Commission may utilize the facilities and services of any Federal agency to the extent that the facilities and services are needed for the establishment and development of an Arctic research policy, upon reimbursement to be agreed upon by the Commission and the agency head and taking every feasible step to avoid duplication of effort.

(c) All Federal agencies shall consult with the Commission before undertaking major Federal actions relating to Arctic research.

ADMINISTRATION OF THE COMMISSION

15 USC 4105

SEC. 106. The Commission may—

5 USC 3131

(1) in accordance with the civil service laws and subchapter III of chapter 53 of title 5, United States Code, appoint and fix the compensation of an Executive Director and necessary additional staff personnel, but not to exceed a total of seven compensated personnel;

(2) procure temporary and intermittent services as authorized by section 3109 of title 5, United States Code;

(3) enter into contracts and procure supplies, services, and personal property; and

(4) enter into agreements with the General Services Administration for the procurement of necessary financial and administrative services, for which payment shall be made by reimbursement from funds of the Commission in amounts to be agreed upon by the Commission and the Administrator of the General Services Administration.

LEAD AGENCY AND INTERAGENCY ARCTIC RESEARCH POLICY COMMITTEE

SEC. 107. (a) The National Science Foundation is designated as the lead agency responsible for implementing Arctic research policy, and the Director of the National Science Foundation shall insure that the requirements of section 108 are fulfilled. 15 USC 4106

(b)(1) The President shall establish an Interagency Arctic Research Policy Committee (hereinafter referred to as the "Interagency Committee"). Establishment.

(2) The Interagency Committee shall be composed of representatives of the following Federal agencies or offices:

(A) the National Science Foundation;
(B) the Department of Commerce;
(C) the Department of Defense;
(D) the Department of Energy;
(E) the Department of the Interior;
(F) the Department of State;
(G) the Department of Transportation;
(H) the Department of Health and Human Services;
(I) the National Aeronautics and Space Administration;
(J) the Environmental Protection Agency; and
(K) any other agency or office deemed appropriate.

(3) The representative of the National Science Foundation shall serve as the Chairperson of the Interagency Committee.

DUTIES OF THE INTERAGENCY COMMITTEE

SEC. 108. (a) The Interagency Committee shall— 15 USC 4107.

(1) survey Arctic research conducted by Federal, State, and local agencies, universities, and other public and private institutions to help determine priorities for future Arctic research, including natural resources and materials, physical and biological sciences, and social and behavioral sciences;

(2) work with the Commission to develop and establish an integrated national Arctic research policy that will guide Federal agencies in developing and implementing their research programs in the Arctic;

(3) consult with the Commission on—

(A) the development of the national Arctic research policy and the 5-year plan implementing the policy;

(B) Arctic research programs of Federal agencies;

(C) recommendations of the Commission on future Arctic research; and

(D) guidelines for Federal agencies for awarding and administering Arctic research grants;

(4) develop a 5-year plan to implement the national policy, as provided for in section 109; 98 STAT. 1247

(5) provide the necessary coordination, data, and assistance for the preparation of a single integrated, coherent, and multi-agency budget request for Arctic research as provided for in section 110;

(6) facilitate cooperation between the Federal Government and State and local governments in Arctic research, and recommend the undertaking of neglected areas of research in accordance with the findings and purposes of this title;

(7) coordinate and promote cooperative Arctic scientific research programs with other nations, subject to the foreign policy guidance of the Secretary of State;

(8) cooperate with the Governor of the State of Alaska in fulfilling its responsibilities under this title;

(9) promote Federal interagency coordination of all Arctic research activities, including—

(A) logistical planning and coordination; and

(B) the sharing of data and information associated with Arctic research, subject to section 552 of title 5, United States Code; and

Public information.

(10) provide public notice of its meetings and an opportunity for the public to participate in the development and implementation of national Arctic research policy.

Report.

(b) Not later than January 31, 1986, and biennially thereafter, the Interagency Committee shall submit to the Congress through the President, a brief, concise report containing—

(1) a statement of the activities and accomplishments of the Interagency Committee since its last report; and

(2) a description of the activities of the Commission, detailing with particularity the recommendations of the Commission with respect to Federal activities in Arctic research.

5-YEAR ARCTIC RESEARCH PLAN

15 USC 4108

SEC. 109. (a) The Interagency Committee, in consultation with the Commission, the Governor of the State of Alaska, the residents of the Arctic, the private sector, and public interest groups, shall prepare a comprehensive 5-year program plan (hereinafter referred to as the "Plan") for the overall Federal effort in Arctic research. The Plan shall be prepared and submitted to the President for transmittal to the Congress within one year after the enactment of this Act and shall be revised biennially thereafter.

(b) The Plan shall contain but need not be limited to the following elements:

(1) an assessment of national needs and problems regarding the Arctic and the research necessary to address those needs or problems;

(2) a statement of the goals and objectives of the Interagency Committee for national Arctic research;

(3) a detailed listing of all existing Federal programs relating to Arctic research, including the existing goals, funding levels for each of the 5 following fiscal years, and the funds currently being expended to conduct the programs;

(4) recommendations for necessary program changes and other proposals to meet the requirements of the policy and goals

98 STAT. 1248

as set forth by the Commission and in the Plan as currently in effect; and

(5) a description of the actions taken by the Interagency Committee to coordinate the budget review process in order to ensure interagency coordination and cooperation in (A) carrying out Federal Arctic research programs, and (B) eliminating unnecessary duplication of effort among these programs.

COORDINATION AND REVIEW OF BUDGET REQUESTS

15 USC 4109

SEC. 110. (a) The Office of Science and Technology Policy shall—

(1) review all agency and department budget requests related to the Arctic transmitted pursuant to section 108(a)(5), in accordance with the national Arctic research policy and the 5-year program under section 108(a)(2) and section 109, respectively; and

(2) consult closely with the Interagency Committee and the Commission to guide the Office of Science and Technology Policy's efforts.

(b)(1) The Office of Management and Budget shall consider all Federal agency requests for research related to the Arctic as one integrated, coherent, and multiagency request which shall be reviewed by the Office of Management and Budget prior to submission of the President's annual budget request for its adherence to the Plan. The Commission shall, after submission of the President's annual budget request, review the request and report to Congress on adherence to the Plan.

Report.

(2) The Office of Management and Budget shall seek to facilitate planning for the design, procurement, maintenance, deployment, and operations of icebreakers needed to provide a platform for Arctic research by allocating all funds necessary to support icebreaking operations, except for recurring incremental costs associated with specific projects, to the Coast Guard.

AUTHORIZATION OF APPROPRIATIONS; NEW SPENDING AUTHORITY

15 USC 4110

SEC. 111. (a) There are authorized to be appropriated such sums as may be necessary for carrying out this title.

(b) Any new spending authority (within the meaning of section 401 of the Congressional Budget Act of 1974) which is provided under this title shall be effective for any fiscal year only to such extent or in such amounts as may be provided in appropriation Acts. 2 USC 651.

DEFINITION

SEC. 112. As used in this title, the term "Arctic" means all United States and foreign territory north of the Arctic Circle and all United States territory north and west of the boundary formed by the Porcupine, Yukon, and Kuskokwim Rivers; all contiguous seas, including the Arctic Ocean and the Beaufort, Bering, and Chukchi Seas; and the Aleutian chain. 15 USC 4111.

Appendix B:
Membership of the U.S. Arctic Research Commission

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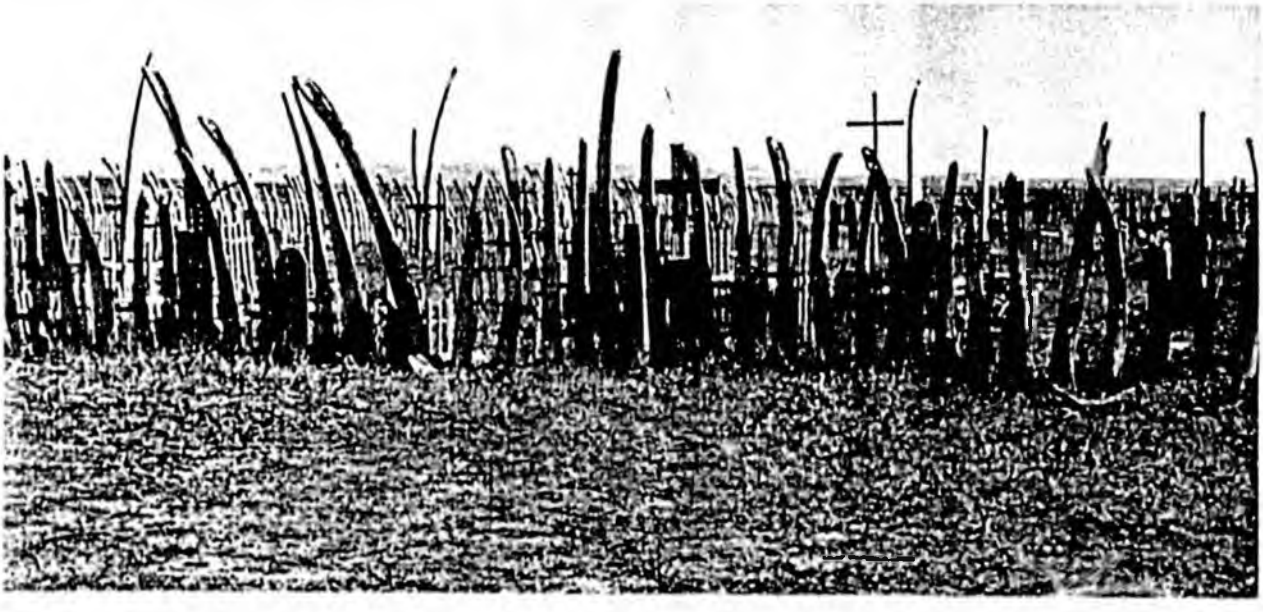
Point Hope Cemetery with whale bone fence.

J. C. LaBelle, AEIDC



Appendix C:
U.S. Arctic Research Commission Group of Advisors

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Appendix D:
Alaska Research Policy

LAWS OF ALASKA

1986

Approved by the Governor: May 24, 1986
Actual Effective Date: August 22, 1986

Source
CSHB 693(SA) am

Chapter No.
32

AN ACT

Establishing the Alaska research policy.

BE IT ENACTED BY THE LEGISLATURE OF THE STATE OF ALASKA:

AN ACT

Establishing the Alaska research policy.

* Section 1. AS 44.19 is amended by adding new sections to read:

ARTICLE 14A. ALASKA RESEARCH POLICY ACT.

Sec. 44.19.250. PURPOSE. The purpose of the Alaska Research Policy Act is to establish state research policy, priorities, and goals, and to provide a plan for basic and applied scientific research for the state, including natural resources and materials, physical, biological, and health sciences, and social and behavioral sciences.

Sec. 44.19.252. STATEMENT OF POLICY. It is the policy of the state in AS 44.19.250 - 44.19.264, to recognize the important role that scientific and engineering research and science education play for tha people of the state and the entire nation. The policy will make it possible to

(1) find, develop, and manage the natural renewable and nonrenewable resources of the state's land and water economically and in an environmentally acceptable fashion;

(2) manage the unique features of the environment, fauna, and flora of the state and protect them from harmful man-made and natural influences;

(3) investigate and mitigate the effects of natural hazards such as earthquakes, volcanic eruptions, avalanches, permafrost, and other hazards that occur in the state;

(4) construct, operate, and maintain transportation

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systems, communications, housing, and other facilities suited to the state's conditions;

(5) develop new technologies adapted to the unique conditions and needs of the state;

(6) improve the health and well being throughout the life cycle of the state's inhabitants; and

(7) identify and address future social and economic challenges facing the state.

Sec. 44.19.254. SCIENCE AND ENGINEERING ADVISORY COMMISSION. The science and engineering advisory commission is established as a permanent advisory agency in the Office of the Governor.

Sec. 44.19.256. MEMBERS OF COMMISSION. (a) The commission is composed of five members appointed by the governor as follows:

(1) one member is to be appointed from individuals from the academic institutions of the state with expertise in areas of research relating to the state including the physical, biological, health, environmental, social, and behavioral sciences;

(2) one member is to be appointed from individuals who are engaged in activities furthering the welfare of the human and physical environment and who have expertise in areas of research relating to the state, including the physical, biological, health, environmental, social, and behavioral sciences;

(3) one member is to be appointed from state departments with research needs; and

(4) one member is to be appointed from individuals familiar with the state and representative of the needs and interests of private industry;

(5) the senior science advisor in the governor's office, who serves as chairman and director of the commission.

(b) The members must be residents of the state and shall be appointed without regard to political affiliation.

Sec. 44.19.258. TERM OF MEMBERS OF COMMISSION. Members of the commission, other than the senior science advisor, serve staggered

terms of four years and until a successor qualifies and is appointed.

Sec. 44.19.260. EXPENSES AND PER DIEM. A member of the commission serves without compensation but is entitled to travel expenses and per diem prescribed for state boards and commissions under AS 39.-20.180.

Sec. 44.19.262. DUTIES OF THE COMMISSION. The commission shall

(1) with the senior science advisor, develop and recommend an integrated state research policy;

(2) provide policy information to the governor and the legislature on matters that have scientific and engineering significance;

(3) receive scientific and engineering information from the academic and industrial communities;

(4) act in an advocacy role for scientific and engineering issues and science education important to the state that might otherwise be overlooked;

(5) assist state agencies in assessing research needs and establishing priorities among them;

(6) facilitate cooperation between state agencies and the University of Alaska and other academic institutions and industry;

(7) recommend methods to improve logistical planning and support for needed state research;

(8) suggest methods for improving efficient sharing and dissemination of data and information in the state among interested public and private institutions;

Chapter 32

(9) promote science education and training for young scientists and engineers to pursue careers in the state and the Arctic;

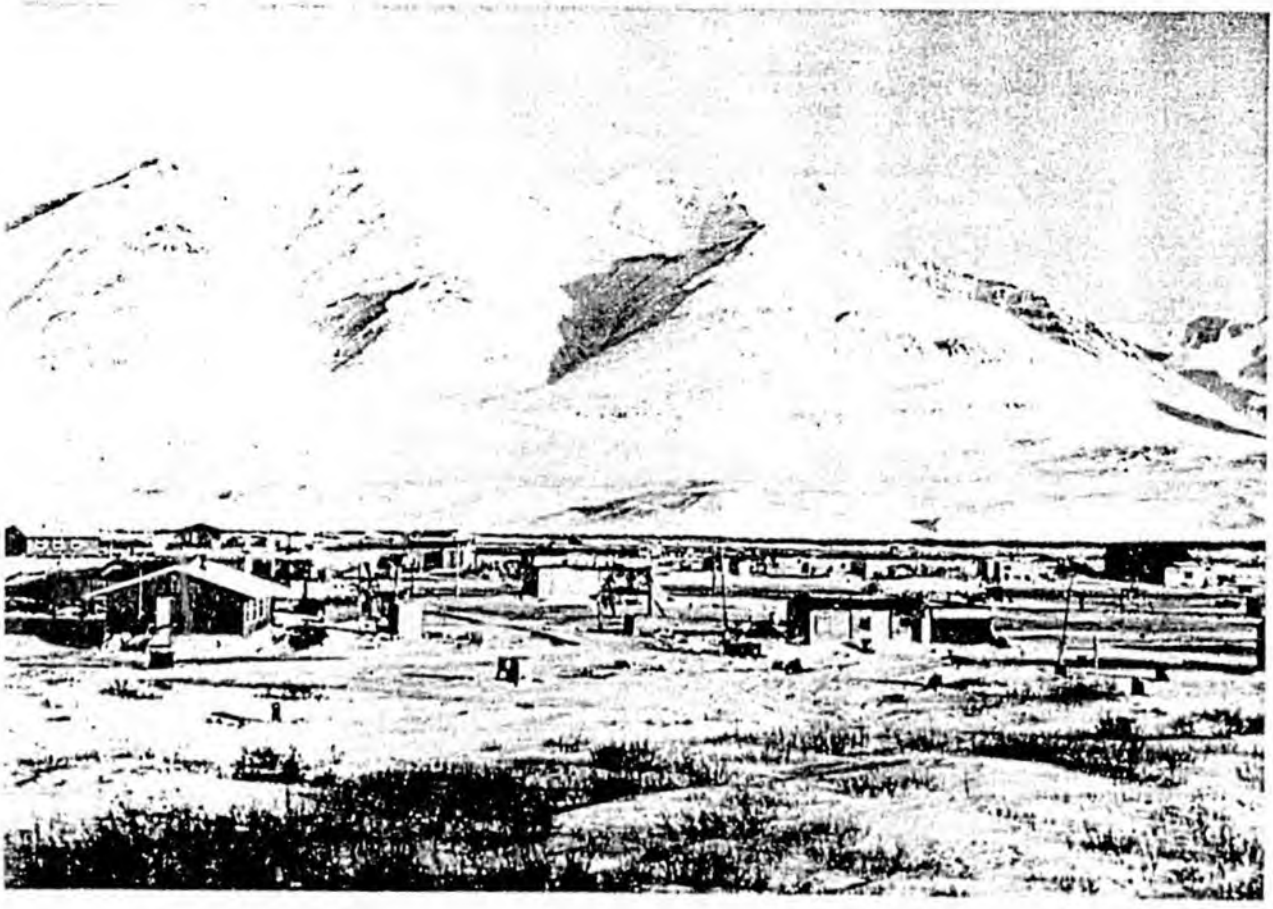
(10) cooperate with the Federal Arctic Research Commission in the formulation of the Arctic research policy; and

(11) not later than September 30 of each year, present to the governor the commission's recommended research priorities of the state for the next fiscal year.

Sec. 44.19.264. SHORT TITLE. AS 44.19.250 - 44.19.264 may be cited as the Alaska Research Policy Act.

* Sec. 2. Notwithstanding AS 44.19.258, added by sec. 1 of this Act, the initial terms of members of the science and engineering advisory commission, other than the senior science advisor, shall be set under AS 39.-05.055(2).

Anaktuvuk, interior arctic village on the Brooks Range. J. C. LaBelle, AEIDC



Appendix E: U.S. Arctic Research Commission and Related Meetings, Fiscal Year 1986

COMMISSION REPRESENTATIVES	MEETING	DATE(S)
A. L. Washburn	Polar Research Board Meeting	October 10-12, 1985
A. L. Washburn	American Society of Civil Engineers Technical Council on Cold Regions Engineering	October 22-24, 1985
All Commissioners	*Arctic Research Commission* Meeting (4th) Los Angeles, California (14th), Seattle, Washington (15th)	November 14-15, 1985
O. Leavitt	"Public Meeting," Inuit Arctic Policy Conference McGill University, Montreal, Canada	November 15-16, 1985
J. Roederer A. L. Washburn W. T. Hushen	Arctic Research Commission report development "National Needs and Arctic Research: A Framework for Action," American Geophysical Union Meeting, San Franciso, California	December 12-13, 1985
J. Roederer A. L. Washburn E. Rasmuson W. T. Hushen	Development of report "National Needs and Arctic Research: A Framework for Action," Anchorage and Fairbanks, Alaska	January 7-10, 1986
W. T. Hushen	Presentation to Alaska Governor Sheffield and cabinet members on work of the Commission, Juneau, Alaska.	January 11, 1986
All Commissioners	*Arctic Research Commission* Meeting (5th), Joint Meeting with Alaska Governor Sheffield, cabinet, and state legislature Committee on Resources, Juneau, Alaska	January 31, 1986
A. L. Washburn	American Society of Civil Engineers Convention, Anchorage, Alaska (banquet address)	February 24-26, 1986
J. Roederer	Presentation at Interagency Arctic Policy Group Meeting	February 27-28, 1986
A. L. Washburn	Permafrost Committee Meeting	February 27-28, 1986
A. L. Washburn	Interagency Arctic Research Policy Committee Staff Meeting	March 3-4, 1986
A. L. Washburn	Polar Research Board Meeting, San Diego, California	March 5-6, 1986
A. L. Washburn W. T. Hushen	Arctic Marine Ecosystems Workshop, Boulder, Colorado	March 7-11, 1986
All Commissioners	*Arctic Research Commission* Meeting (6th) Public Meetings in Kodiak and Anchorage, Alaska Public Lecture "Age of the Arctic" by O. Young, Anchorage, Alaska	April 27-29, 1986

COMMISSION REPRESENTATIVES	MEETING	DATE(S)
A. L. Washburn W. T. Hushen	Workshop of Ocean Management Policy, AEIDC, Anchorage, Alask	April 30, 1986
A. L. Washburn W. T. Hushen	Interagency Arctic Research Policy Committee Workshop on Energy & Minerals	April 31 - May 2, 1986
E. Rasmuson A. L. Washburn W. T. Hushen	Meeting with President & Executive Director, Alaska Oil & Gas Association	April 30, 1986
L. D. Perrigo J. Roederer	Reception for Frank Press, President, NAS, Fairbanks, Alaska	May 11-12, 1986
A. L. Washburn W. T. Hushen	U.S.-Canada Beaufort Hydrocarbon Review, Washington, D.C.	May 13, 1986
L. D. Perrigo	Meeting with Alaska state officials, Juneau, Alaska	May 22-23, 1986
L. D. Perrigo	Site visit to Dutch Harbor, Prudhoe Bay, and *Icebird*	July 7-19, 1986
J. H. Zumberge W. T. Hushen	Meeting with P. Yost, Commandant, U.S. Coast Guard, briefing on navy's arctic research needs & meeting with officials of Office of Management & Budget	July 9, 1986
All Commissioners	*Arctic Research Commission* Meeting (7th) Los Angeles, California	July 23, 1986
O. Leavitt	Presentation to Inuit Circumpolar Conference, Kotzebue, Alaska	August 1986
A. L. Washburn J. Roederer J. H. Zumberge W. T. Hushen	Interviews with Ted Stevens. Meeting with Erich Bloch, Director, National Science Foundation (NSF), and Frank Press, President, NAS	September 8-9, 1986
L. D. Perrigo	Information gathering on Arctic logistics in Los Angeles, Denver/Boulder, and Seattle.	September 26 - October 5, 1986