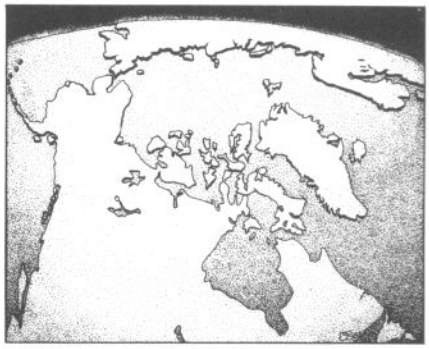
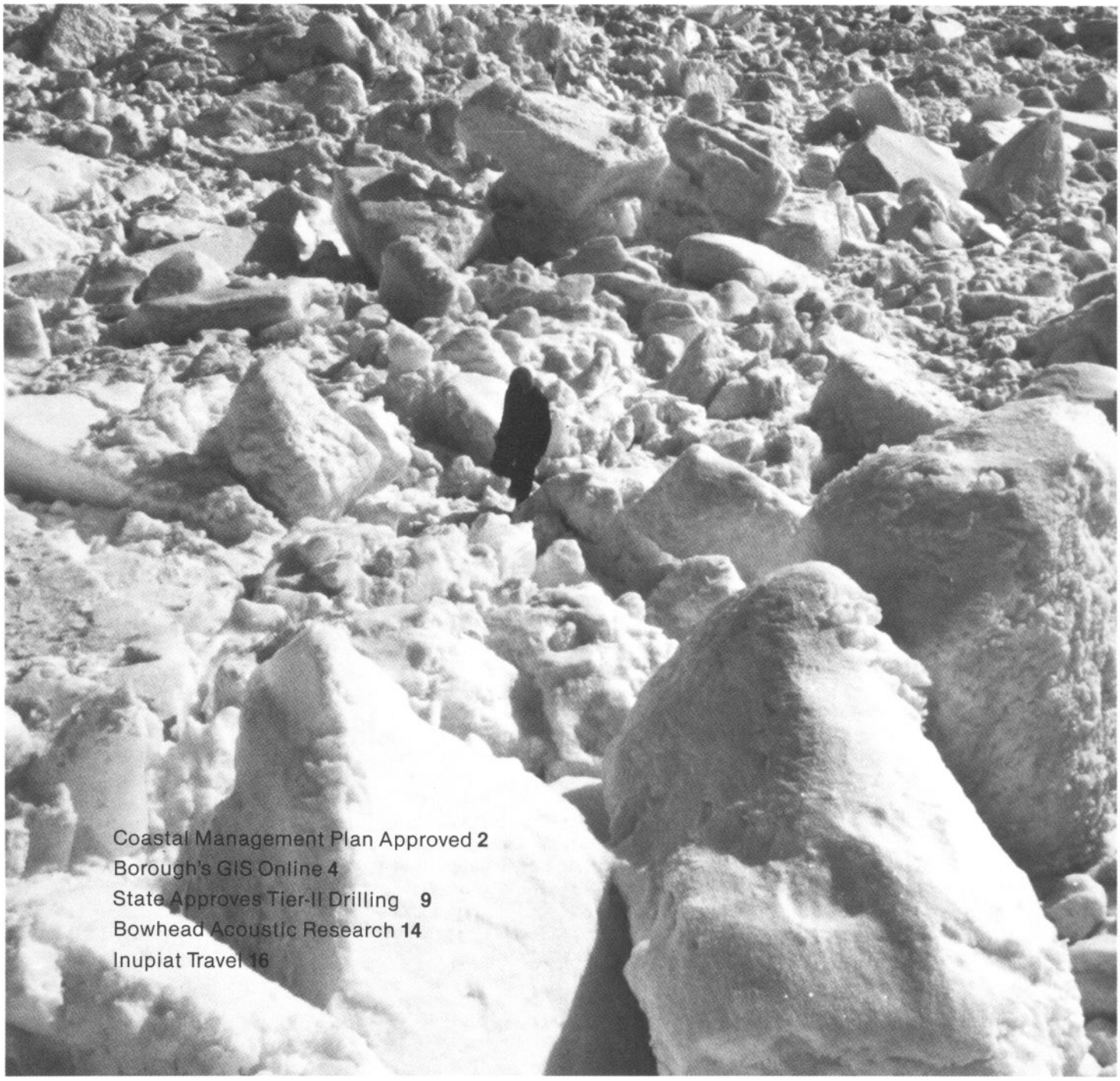
The ARCTIC POLICY REVIEW



March–May 1984, Vol. 2, Issue 6



A Publication of the North Slope Borough, Alaska

NSB Assembly taking final comment on the CZM Plan: after five more years of preparation, the mood was confident.

NSB Assembly Approves Coastal Management Plan

Goes to State Coastal Management Council

When Stuart Denslow and his project associates got on the early-morning Wien Airlines flight to Barrow on 8 February 1984 they were greeted by others on the plane who knew why they were going to Barrow, and well-wishers wished them luck. Denslow and his crew from the architecture and planning firm of Maynard and Partch were on their way to the final public hearing on the NSB Coastal Management Plan before the NSB Assembly. The Maynard and Partch staff had worked with NSB Coastal Management Program Director Karla Kolash since 1980.

Kolash had been through this procedure once before, in 1979, when the Alaska Coastal Policy Council rejected the NSB's Mid-Beaufort Coastal Management Plan during a meeting held in Barrow. At the time, Kolash was an employee of Trustees for Alaska, the environmental law firm employed by the borough to help draft the borough's Mid-Beaufort Plan, which would establish coastal zone management consistency standards for the State/Federal Beaufort Sea Oil and Gas Lease Sale and subsequent exploration.

The Coastal Policy Council ruled the borough would have to bring a complete coastal management plan before the Council, and former NSB Planning Director Herb Bartel hired Kolash to continue the borough's Coastal Management Planning program as an employee of the NSB Planning Department. Kolash was able to avoid repeating mistakes made in the rush of developing the Mid-Beaufort plan and to build upon the borough's experience gained in its development.

Kolash and her planning consultants established a productive working relationship with the NSB Planning Commission. Two of these Commissioners, Chairperson Mary Edwardsen and former state representative and Barrow City Manager Brenda Itta took a special interest in the Coastal Management Plan. Key to their strategy was the development of the borough's pioneering Comprehensive Plan last year, and the good impression made by the administration of NSB Coastal Zone Administrator Warren Matumeak and his staff assistants, Tom Barnes and Shehla Anjum. Both have taken pains to interpret the borough's Land Use Regulations, and to expedite permit application processing.

The borough's Comprehensive Plan was strongly opposed by the oil and gas industry, and many concessions were made without gaining industrial approval of the version finally adopted. The enactment and subsequent administration of the borough's Comprehensive Plan seemed to have taken the fight out of the borough's coastal management opponents.

Public testimony at the assembly's public hearings began with Edwardsen and Itta describing the public-review process through which the draft plan had been taken. Kolash and the Planning Commission had been careful to hold extensive public hearings, and to circulate the evolving text widely over the past four years.

The mood and size of the gallery of the NSB Assembly chambers was different than in the hearings of 1979, when oil company opposition to the Mid-Beaufort CZM Plan was voiced in strong terms by senior executives jetted up from headquarters in Houston. This time, the industry VIP's were missing, and the statements of their community-relations representatives opposing the borough and state coastal management plans seemed perfunctory and half-hearted.

There were also some reservations voiced by the Alaska Department of Natural Resources. For the most part, however, testimony at the day-long hearing was very positive and urged the assembly to adopt the plan and send it off

to the Alaska Coastal Policy Council.

Amy Kyle of the Office of Coastal Management, who had worked on the borough plan for the past 18 months, felt the borough should make more specific the plan's assertion of its authority over historical and cultural sites and the offshore habitat of the bowhead in order to pass muster with the Coastal Policy Council. Unclarified, she said, it might seen as suggesting too much local control over land use of state concern.

Kyle also wanted it made clear that the borough was only nominating AMSA sites (Areas Meriting Special Attention), rather than designating them in the Plan. If they were designated, each AMSA would need its own management plan. And she also wanted better connection between the state and borough coastal-zone land-use permitting systems in keeping with the Governor's state land-use permit-reform program. Last minutes revisions were made by the assembly to accommodate these concerns.

Catching many onlookers by surprise, the assembly voted to adopt the Plan shortly before the adjournment instead of waiting for the evening session. When assembly president Lennie Lane announced adoption of the ordinance and rapped adjournment, many realized how much attitudes had changed since 1979 and how well the borough's new Coastal Management Plan would stand for passage by the Alaska Coastal Policy Council and the state legislature.

The borough's District Coastal Management Plan is under a 90-day review by Amy Kyle and her associates at the State Office of Coastal Management, and will be taken up by the Coastal Policy Council in September or October. If approved, the plan will be included as a section of the borough's Comprehensive Plan, and as part of the state's own land use regulations. While federal arctic land-use regulations won't be affected, federal agencies will be required to pass Alaska coastal management consistency tests within the state's territorial limits.

As a result of the recent Supreme Court decision, Federal OCS leasing does not now fall under the influence of State and local coastal management plans. In response to this decision, U.S. Senator Edward Kenney (D-Mass.) and Senator Robert Packwood (R-Ore.) have introduced a bill to amend Federal OCS and CZM laws and regulations to bring Interior's off-shore oil, gas, and mining leasing program under state and local coastal zone management consistency requirements. Early in March, NSB Mayor Eugene Brower wrote to Alaska's U.S. Senator Ted Stevens asking him to support the Kennedy/Packwood measure. ■

Left to Right: Kolash, Matumeak, and Edwardsen: pioneering, strategy, and making a good impression.

On the cover: spring ice off Pt. Hope, 1983.

The ARCTIC POLICY REVIEW

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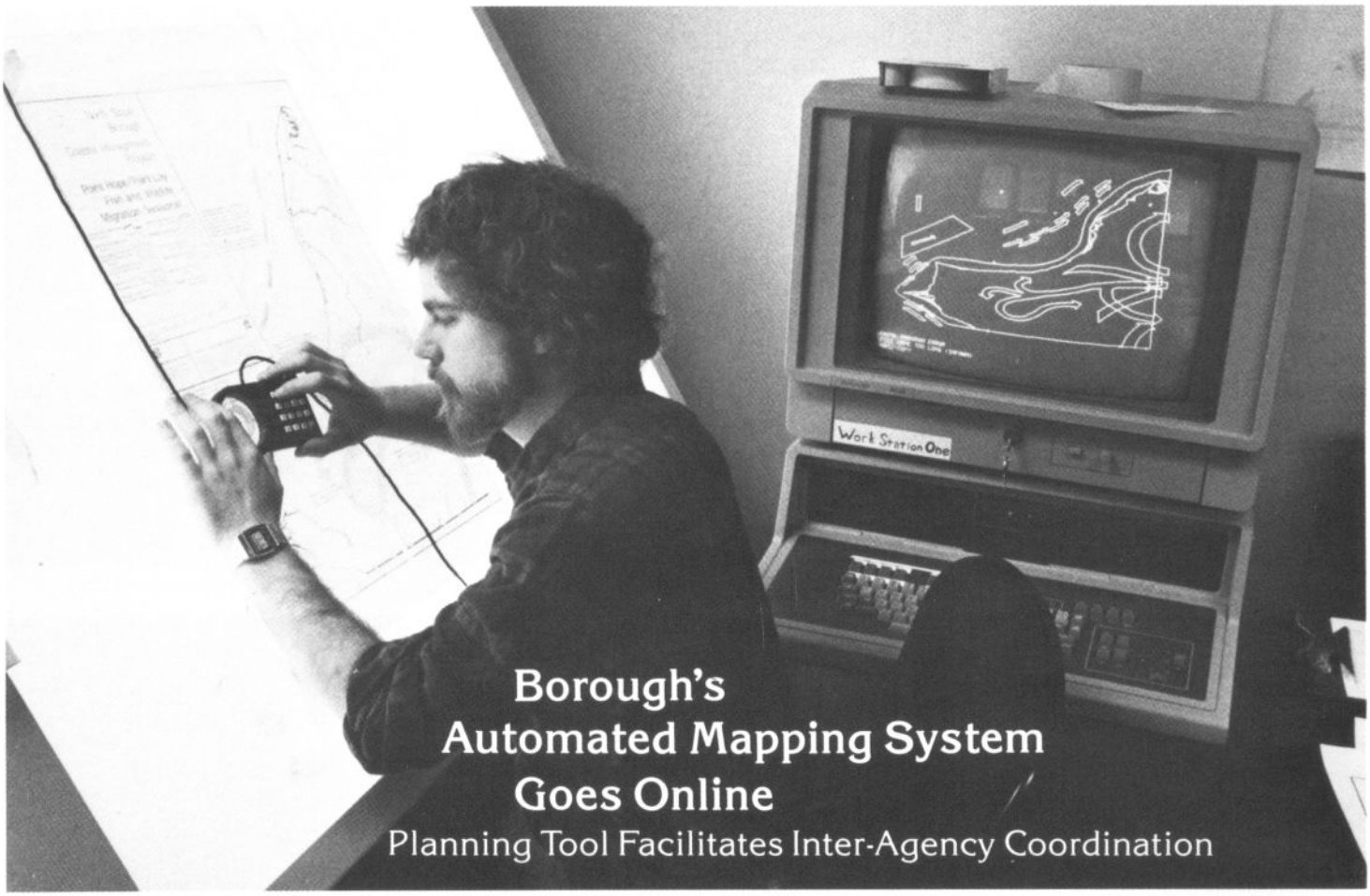
The North Slope Borough was incorporated as a first-class borough 1 July 1972. A Home Rule Charter was adopted by the Borough on 30 April 1974. The North Slope Borough is the regional local government of northern Alaska, with mandatory powers of taxation, assessment, education, planning, and zoning. Within its boundaries are eight Inupiat Eskimo communities (pop. 4,693), seven military installations (pop. 193), and the Prudhoe Bay Resource Development District (pop. 7,843), 88,281 square miles of land and nearly 800 miles of arctic coastline, constituting 15 percent of the State and the largest municipality in the U.S.



Borough's Automated Mapping System Goes Online

Planning Tool Facilitates Inter-Agency Coordination

GIS staff John Carlson digitizing a NSB Coastal Management map: a changing, living, working system, a tool for cooperative habitat management.

An important part of the Borough's new District Coastal Management Plan has been the development of its automated $3-million Geographic Information System (GIS), which was demonstrated to the Borough Assembly in February 1984 when it approved the Plan.

As outlined in the September 1982 issue of APR, the GIS is made of four modules:

- The Environmental Information System;
- The Automated Review and Comment System (ARCSystem);
- Environmental Library System; and
- The Land Records System.

Much of the data preparation and entry has been completed, along with system software development. Installed in the U.S. Fish and Wildlife Service (USF&WS) headquarters in Anchorage, the easy-to-use menu-driven system is accessible throughout Alaska, the U.S., and Canada from common terminals and microcomputers with dial-up modems. Users with a terminal capable of Tektronics-4010 emulation can display the maps. Those with a "bit pad" (digital-entry drawing board) can also enter development-location data and review maps to make full use of ARCSystem. Terminals have been installed in other borough offices where training and use of the system is taking place.

In spite of budget constraints, NSB Mayor Eugene Brower orders go ahead for the pioneering automated mapping system saying, "The GIS is an important part of the politics of cooperative habitat management with the state and federal governments. I regard its success as one of the important accomplishments of my administration." While the system software continues to be refined, the GIS is already being used for the development of several important borough projects. As GIS project development Director Pat Webb says, "We will continue to add and upgrade additional information in the data base as it becomes available, change lines when necessary, and continue to evolve it. It is a working, living system, not something that is static, as if we captured things at one point in time."

There have been fifteen quads completed at the 1:250,000 scale, which cover the entire coastline and supports the majority of the Coastal Zone Management Plan. The remaining ten quads of the borough will be completed by 1985. Also completed are twelve quad equivalents at 1:63,360 (one inch to the mile) scale, with most of that covering the Kuparuk-Prudhoe Unit Area, one quad in the Arctic National Wildlife Range (ANWR), the quad covering the proposed Red Dog Mine in the southwestern corner of the borough, and on the quads that bound the Haul Road. About ten more maps of this scale will be added covering the Kaktovik land transfers and

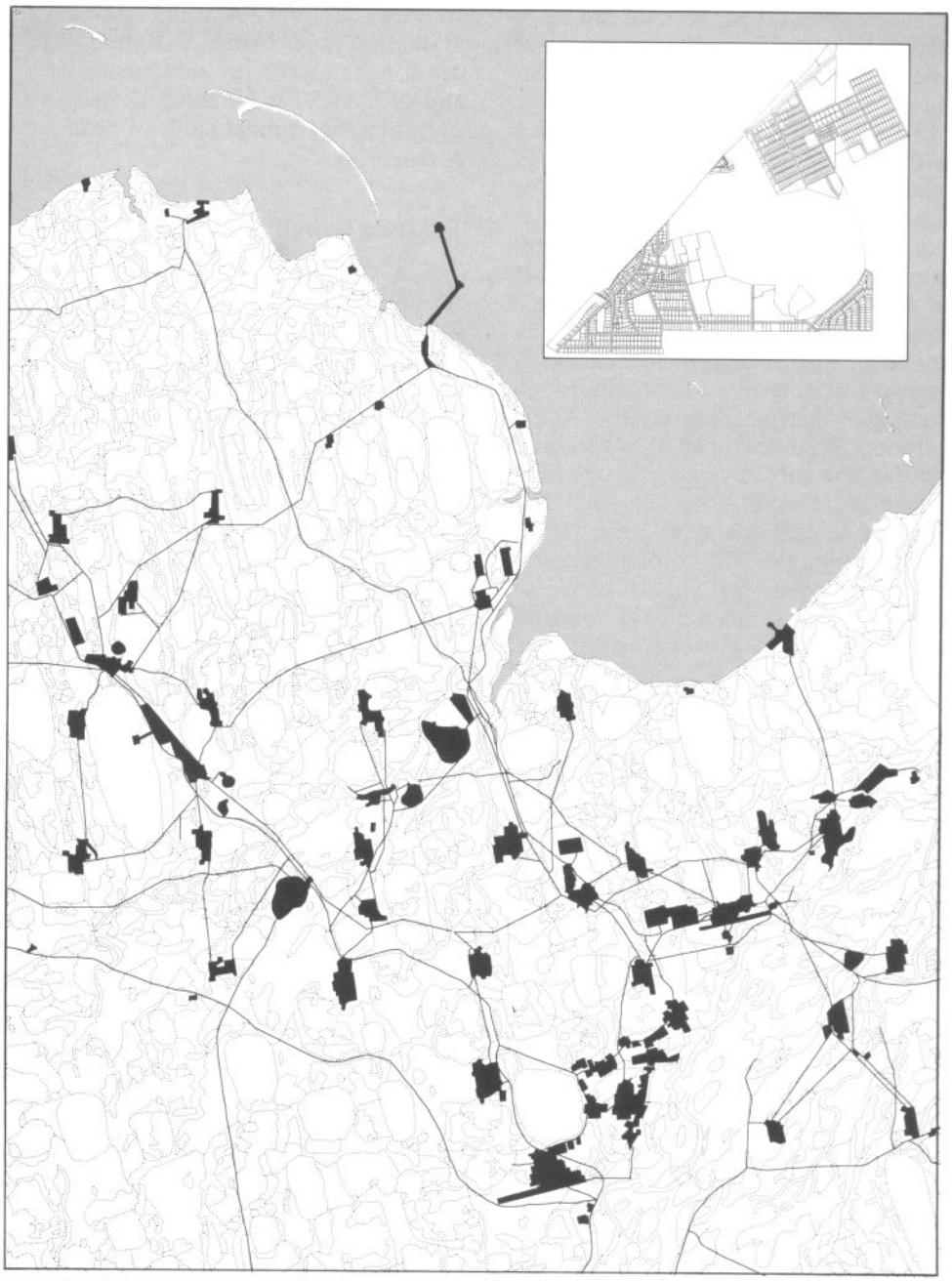
Teshukpuk Lake area.

Also being included in the data base this year is the 1:6,000-scale geobotanical atlases for the Prudhoe-Kuparuk area, which have been developed mainly by the Institute for Arctic and Alpine Research (INSTAAR) in Boulder, Colorado. This project includes a cumulative impact study for the Prudhoe Bay area being done cooperatively by the USF&S and the EPA. Its purpose is to track vegetation changes since 1942 to the present, comparing changes before and after oil development for purposes of creating a vegetation-impact model.

In the Environmental Library System, approximately 2,100 citations have been entered from the borough's own library and there will be another 500-1,000 to be added this year, including large portions of research relating to the Arctic and arctic activities, including Environmental Impact Statements and Reports.

All of the village land-records have been entered into the Land Records System. In this next year, the borough land records will be linked directly to those of the state, USF&WS, and the BLM. As Director Pat Webb says, "We have in effect created a general land-ownership map at 1:250,000 scale of resolution, and we hope to continue to refine that data and make it more specific, down to actual boundary definitions. We would like to keep track of not only surface rights, but also subsurface ownership and leases. We hope to help integrate the land record system used by the DNR, the federal agencies and ourselves in order to have a consistent data file."

The Automated Review and Comment System (ARCSystem) has functions of its own, but also functions as a command system for easily manipulating the other components of the GIS. The ARCSystem prototype was completed in November, and its ability to create research documents, provide permit processing advice, and analyze multiple development types is now being finalized. "We are now able to tie the map data to the borough regulations," says ARCSystem designer Chuck Henderson, "and we are in the final stages of developing the text in which the ARCSystem responses are worded. This next year, besides refining the logic and textual information, we will also expand ARCSystem to respond to 13 other types of development activities requiring government land-use permits such as exploratory and seismic activity, airport construction, and subdivision development."



Detail of Beechy Point map showing surface-soil types, trails, docks, roads, pipelines, and pads at Prudhoe Bay, scale 1:63,360. Inset: Land Use Records map of Barrow, scale 1:1000.

Quality Control and Inter-Agency Coordination

A major part of the GIS development process included 1) quality control of data entry and system development and 2) close coordination with system users, including other government agencies and industry. Much of this was addressed in the monthly meetings of the North Slope Borough Data Base Coordinating Committee held in Anchorage, which was used to communicate with those having any connection with the project or any potential use for the data. Regular participants included representatives of the Department of Natural Resources (DNR), U.S. Geological Service (USGS), the Bureau of Land Management (BLM), the U.S. Fish and Wildlife Service (USF&WS), ARCO and SOHIO (the major oil-company participants), private consultants, and NSB staff.

Talking about the function of the Coordinating Committee, Pat Webb said, "We have tried to establish an open-door policy, so that we don't create the impression that the borough is creating something behind closed doors to hit industry over the head with later on. We want their total and full participation from the start,

Continued next page

so that when it is complete, we can agree about where the lines are on the ground and go from there to where the disagreements might be."

The participation of other agencies with the borough in developing the GIS added more emphasis to the need for inter-agency compatibility and coordination. The NSB has a cooperative agreement with the DNR, which is paying half of the 1:250,000 mapping cost, with a total commitment of $750,000. The cooperative agreement with the USF&WS includes sharing space for the borough computer, sharing data on the Arctic National Wildlife Range (ANWR), and sharing the software-conversion necessary for data exchange between the USFWS Data General and the NSB's Prime computers. The borough recently signed an agreement with USF&WS to cooperatively fund national wetland inventory mapping work within the borough. This year's work includes most of the coastal plain between Barrow and the Canadian border.

The borough is also able to take advantage of other cooperative agreements such as the one between USGS and the state which has produced about ten 1:250,000 ortho-photo quads within the borough, which have been made available for use as base maps. Finally, the borough is formalizing an agreement with the Subsistence Division of Alaska Department State Fish and Game (AKDF&G) to develop standards for subsistence data and with AKDF&G Habitat Division to support their regional guide work in the Arctic.

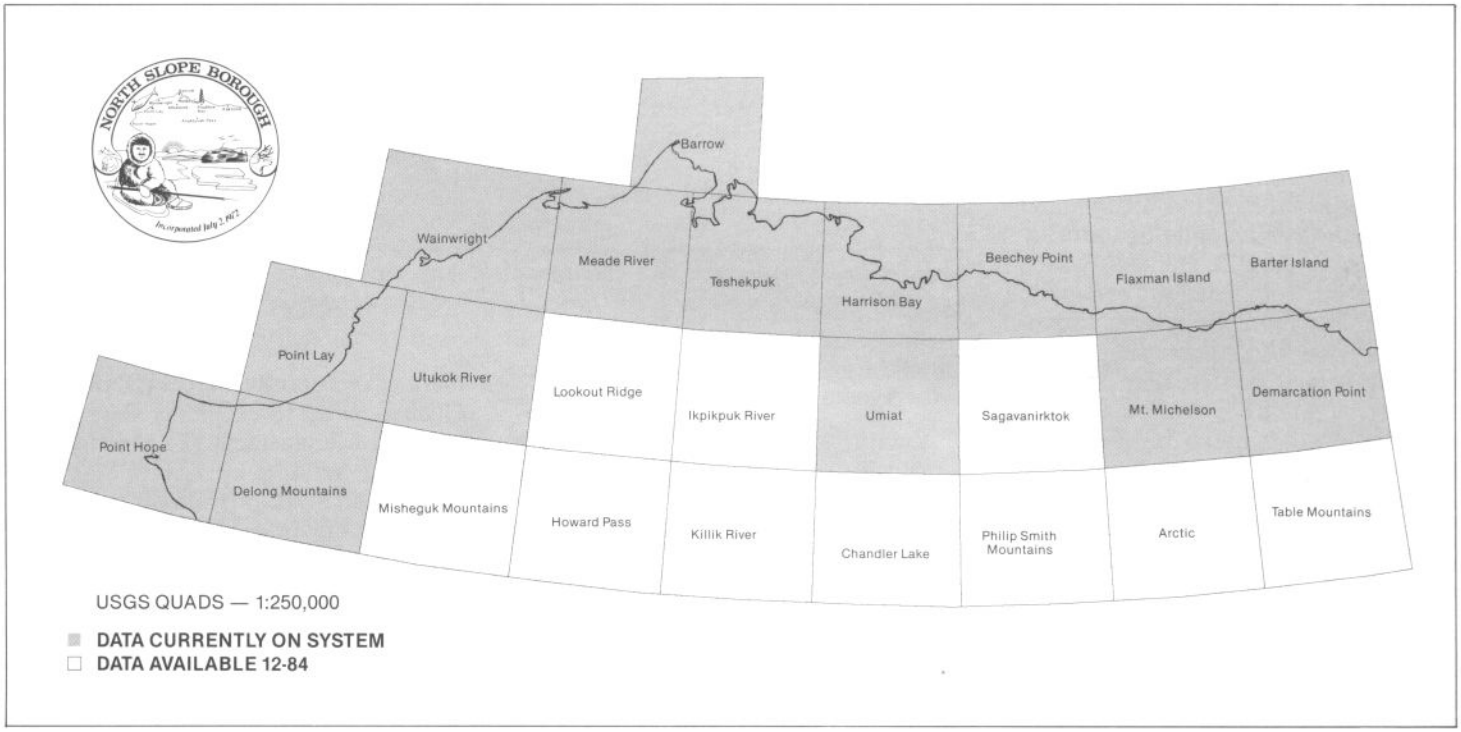
The Data Entry Process: The Maps

The North Slope Borough Science Advisory Committee, Mayor Brower's academic backup at the University of Alaska at Fairbanks, was given a demonstration of the project in Anchorage on 16 May, 1983. Among other recommendations, the Committee called for "some method of evaluating the photo interpretation" upon which the GIS map accuracy is based.

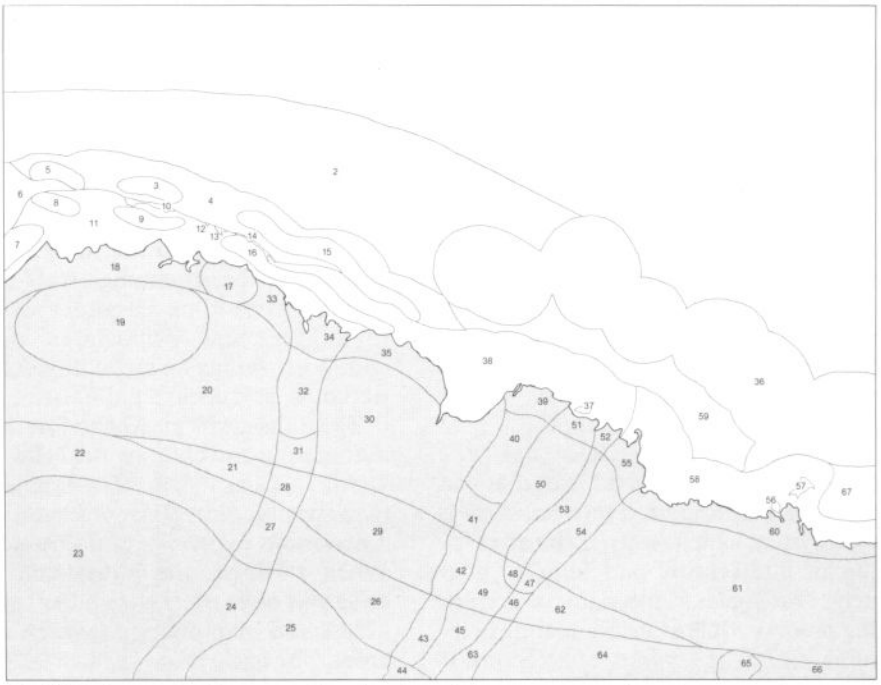
In June and November two different quality-review assessments of the GIS were made. In June, more than 65 people participated—mostly members of the NSB Data Base Coordinating Committee—in a week-long evaluation in Anchorage of the map delineation and attribute assignments for the 1:250,000 maps. The November assessment, held in Redlands, California, was attended by state-selected experts who examined the processes of the map interpretation and data entry which had been developed by the chief GIS contractor, Environmental Systems Research Institute (ESRI) of Redlands, California, under the leadership of Jack Dangermond.

The process of data entry consists first of all in reconciling the maps and overlays (many of which come from different sources) and registering them with orthophotos (corrected aerial photo maps). A map detailing vegetation, for example, might give a different outline of a river bank than does a corresponding map detailing land-forms. The reconciliation is done by a photo interpreter with expertise in the particular resources. When the differences between maps cannot be corrected with the aerial photo, other resource experts may be called in or even sent to the field to make an on-site investigation. The corrected maps are then digitized and entered into the system.

The resulting composite map now consists of thousands of figures, called "polygons," each of which encloses and describes one or more features, called "attributes," derived from the source maps relating to categories such as vegetation, hydrology, archeological sites, geology, soil, land use, slope, elevation, habitats, borough zones, sections, ownership, historic and cultural sites, transportation, and structures. Each polygon is numbered and its related attribute information coded and entered into the data base.



The GIS 1:250,000 quads: an immense data base detailing 240 levels of information of an area larger than the 10th largest state in the Union, accessible to anyone with a computer and a modem.



Toshie Harnden is Vice-president of the ESRI subsidiary, Aerial Information Systems, that developed the composite photo interpretation system used in the GIS. Right: one level of polygons (1:250,000 scale) showing NSB planning area designations hear Prudhoe Bay.

The quality-review process of the GIS carefully sifted through the standards applied in the entry of the data, which has now includes composite maps of two scales and related attribute descriptions of immense detail.

Accessing and Using the GIS

The language of the Environmental Information System is the computerized mapping program developed by ESRI called ARC/INFO, a geoprocessing-graphics program which has been merged with HENCO's INFO, a high level data base management program. Together, ARC/INFO enables GIS users to enter and correct map and related information as well as to display and manipulate it in any configuration. The user may instruct the computer, for example, to paint in red all the mineral deposit locations on a displayed map, or paint in green all caribou habitat during any given season.

But it is the Automated Review and Comment System (ARCSystem), Alaska's first "expert system" using artificial intelligence technology which provides the most sophisticated use of the GIS data. ARCSystem was developed by ESRI and another leader in the field of geoprocessing and computer graphics, Henderson & Associates of Berkeley, California. The ARCSystem software—also installed on the NSB GIS Prime 550B computer system at the USF&WS computer room in Anchorage—functions as a command system which utilizes the automated maps, ESRI's ARC/INFO mapping software, TEXT (a word processing system), ELS—the Environmental Library System, Henco's INFO, and a number of other slave programs transparent to the user.

The main purpose of the ARCSystem is to facilitate the process by which the borough planning and permit staff can review, comment upon, and issue permits for industrial development projects within sensitive Arctic wildlife habitat. ARCSystem can generate internal review documents, inter-agency and permit-applicant letters, query responses, the permits themselves, related maps, and other documents—drawing from the information contained in the GIS data base.

There are now fourteen different categories of information available thorough the ARCSystem, including variances, mitigation advice, scientific information, data element descriptions, bibliographic references, and state and federal requirements.

A special research team familiar with scientific literature and environmental law and policy worked with computer programmers in developing the ARCSystem knowledge base. They began by creating texts that relate to and expand upon the map-and-attribute information contained in the data base. The ultimate effect is "literate maps" which offer a high level of environmental and regulatory information relating to a particular location and a specific development activity.

An ARCSystem user first enters the exact geographic coordinates of a development location: this tells the ARCSystem where to look. Two other components must be entered prior to an ARCSystem run. The first is the type of development being proposed. Extracting gravel, for example, is different in its impact from building a road. The second is standard application data, i.e. name and address of the applicant. With this data ARCSystem automatically interrogates the geographic data base and eventually arrives at appropriate regulatory decisions and advice: borough regulations and policies, the positions and statements of other agencies, and the findings of science—all of which can be utilized by the permit reviewer in several forms before making a decision.

The ARCSystem isolates or "cuts out" the relevant portion of the composite map and draws a series of buffer zones around the outline of the proposed project. It "tests" the attributes encoded in all the polygons within those buffer zones, which in turn "flag" related regulatory provisions, comments, and scientific data. The related texts are then assembled together with the maps and edited for documentation printout. The whole process takes the computer a couple of hours to finish.

Continued next page

Soon, over 130 permit applications submitted to the borough since January 1983, will be accessible by phone on the ARCSystem. Users will be able to review a permit selected by type, date, company applicant, and so on.

The ARCSystem will enhance the consistency of the reviewing process by reviewing each proposal impartially and by always using the same criteria (the data on the maps) to make determinations. Even more helpful, the system will allow developers to preview the permit system even before they apply for a permit, so that they will know what to expect.

Chuck Henderson stated that "the ARCSystem is a powerful tool that can give advice to the permit process, but it is not a system which removes the need for human intervention and human judgment. Our goal is to speed up the permitting process while at the same time helping to improve the quality of decisions. If the ARCSystem is a success, it will free the developer and planner to concentrate on key decisions, rather than on data gathering."

New GIS Projects

Pat Webb pointed out that while the GIS is being fine tuned and the data base completed, it is already doing work for the borough. "We are going beyond development of the four components of the GIS and starting to use them in new applications," he says. "The first one is the creation of our Archeological Data Base. This not only shows where the archeological sites are on the map, but creates a relational data base of all the archeological textual information that pertains to the site. We are using the information generated by the work of Edwin Hall and John Carnahan, which covers over 2,500 sites, of which 2,000 sites have already been entered."

The Haul Road Area Data Base will embrace an area approximately twelve miles on each side of the Haul Road, and will have more than seventeen information layers which can be plotted on a variety of maps. A general-distribution map set will be produced which will include several mylar map overlays that can be easily updated. Since over 70 layers of information are available in the Sagavanirktok and Phil Smith Mountain quads (1:250,000), considerably more information will be accessible in these areas.

Another application of major interest is the application of the GIS to the borough's Energy Plan (see APR, Dec. 1983) for the purpose of doing initial impact assessments of various proposed routings and a suitability analysis of corridor selection. The system's own definition of an optimal route based on criteria such as land forms, vegetation, soils, and other selected environmental constraints will be compared to the routes already proposed. The Anchorage staff is conducting a resource inventory of these routes, searching for potential conflicts with such things as archeological sites, wetlands, and critical habitats.

The GIS staff in Anchorage is also automating and entering the NSB Arctic District Coastal Zone Management maps produced by Maynard and Partch, Anchorage environmental consultants. When finished, the automated CZM atlas will offer users the ability to easily access and manipulate the maps in full color. The basic maps have already been entered, and entry of additional data including ice hazards, coastal erosion, and wildlife concentration and migration is being completed.

Top GIS Expert Joins Team

On 8 May 1984, Mayor Brower announced the addition to the GIS project team of Earl Nordstrand, formerly Research Director of the Minnesota Land Management Information Center. Nordstrand helped develop the Minnesota GIS, which last year was recognized as the most outstanding automated regional information system in the nation by the Urban Regional Information Systems Association. The Minnesota project shares much with the borough's system. Both operate programs developed by ESRI, use the same languages, and are installed on the same Prime computer.

Pleased with this addition to the GIS staff, Mayor Brower feels Nordstrand will add much to the general excellence of the system. "With the GIS up and running," he said, "we will be able to share even more our knowledge of this great arctic homeland."

For more information concerning the NSB GIS, contact:

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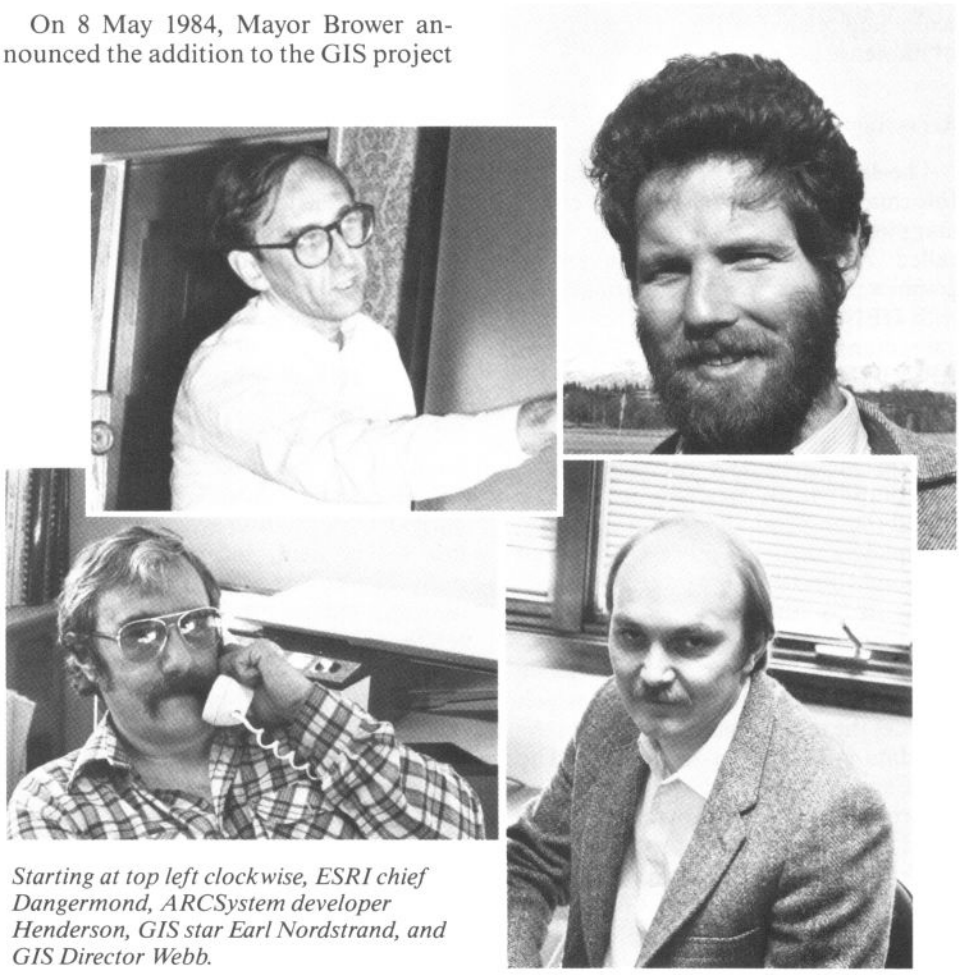


Starting at top left clockwise, ESRI chief Dangermond, ARCSystem developer Henderson, GIS star Earl Nordstrand, and GIS Director Webb.

State Lifts Beaufort Broken-Ice Restrictions

NSB Court Action Averted

On 14 May 1984, NSB Mayor Eugene Brower and Alaska Governor Bill Sheffield reached compromise over the State's controversial relaxation of its seasonal drilling restrictions in the Beaufort Sea. The next day, Esther Wunnicke, Commissioner of the Department of Natural Resources (DNR), and Richard Neve, Commissioner of the Department of Environmental Conservation (DEC), issued their "Decision regarding the oil industry's capability to clean up spilled oil in the Alaskan Beaufort Sea during broken ice periods."

The decision allows year-round drilling inside the barrier islands and a 10-month drilling season north of the islands. And it establishes requirements for a 5-year oil-spill research and development program, and for a bowhead whale monitoring program, both of which will be designed and conducted with the cooperation of the North Slope Borough.

The commissioners based their decision to extend the drilling season on a "finding that the oil industry possesses adequate capability to clean up oil spills during broken ice periods"—a conclusion with which the borough does not agree.

ABSORB's storage facility at Prudhoe Bay: a new market for old technology.

The Battle Over Offshore Regulations

The compromise agreement for the borough not to sue to stop Tier II oil spill capability certification followed many years of negotiations between the State and the North Slope Borough. In an unending series of public hearings held by State and Federal agencies since 1974, NSB officials have warned of the industry's inability to cleanup the oil that will be spilled when arctic-storm-driven ice sheets push rigs off their artificial gravel island pads and break up offshore pipelines.

In the face of energy policies shaped by the Arab oil boycott, rather than try to stop all Arctic offshore oil and gas leasing, the NSB sought only to prevent leasing and operations north of the barrier islands, where ice forces are most dangerous, and in the path of the bowhead whale, an endangered species protected by the Endangered Species Act (ESA).

The oil industry's inability to clean up arctic oil spills was first documented in Canada by the Canadian Arctic Resource Committee (CARC), which in 1976 published Oil Under the Ice, co-authored by Dougald Brown, Kenneth P. Sam, and Douglas Pimlott, CARC's first Chairman and a wildlife biologist, who worked three years on the project with the Inuvialuits' land-claims organization in Inuvik, the Committee for Original Peoples Entitlement (COPE). In 1975, the NSB began working with COPE in shaping its offshore oil and gas operations policies. NSB Mayor Eben Hopson had been asked by COPE to intervene with the Canadian External Affairs Minister against approval of DOME Petroleum's proposed Mackenzie Bay operations off Tuktoyaktut, N.W.T.

The NSB's cooperation with COPE provided insight into how the Canadian Beaufort Sea operators dealt with local environmental, habitat, and land claims concerns. NSB officials took careful notice of the Beaufort Sea Community Advisory Committee, jointly organized by industry and government, and of industry's refusal to deal with COPE. The Beaufort Sea Community Advisory Committee became the focus of a massive public-relations campaign in which the question of oil spill preparedness became a sub-specialty: how to put the best face on the fact of industrial inability to remove oil from the ice.

In 1976, the late NSB Mayor Eben Hopson was warned by Canadian and U.S. Arctic environmental scientists meeting together in Seattle that the oil industry was about to overstep its technical ability in the Arctic. The first evidence of this, he was told, was in the industry's limited proven oil-spill recovery ability and experience.

In 1978, NSB observers were dispatched to Brest, France, to tour the spill of the Amoco-Cadiz with French officials who complained that all of the oil industry's oil-spill recovery methods and technology had failed.

In Alaska, the oil industry dealt with

Continued next page

this touchy matter through the Alaska Oil and Gas Association (AOGA), who displayed much the same behavior as that of Canada's Arctic Oil and Gas Operators Association. While government arctic environmental scientists tried to measure potential impacts from oil and gas development, AOGA hired scientists to minimize potential impacts. Rather than pioneer new arctic oil-spill recovery technology able to operate in Arctic weather and ice conditions, AOGA conducted an expensive public relations campaign designed to sell technology which had failed California and France.

The Division of Risk Assessment

The outcome of the NSB legal defense of the Beaufort Sea was a new legal doctrine—embodied in the National Environmental Protection Act and the Endangered Species Act—which divided risk assessment into two discrete sectors, exploration and production. The Interior Department in preparing for a lease sale may now consider only those impacts associated with leasing and follow-on seismic and drilling exploration. Predictable impacts from production field development are to be considered only if commercial discoveries were made. This compartmentalization was further extended the when U.S. Supreme Court stated that OCS sales were exempt from provisions of the National Coastal Zone Management Act, and state and local coastal management agencies.

The 1979 Beaufort Sea sale was a joint state/federal lease sale, and it was the nearshore state leases which were first explored. This exploration has proceeded under the regulation of the Alaska Oil and Gas Conservation Commission, appointed by the Governor and without much consultation with the North Slope Borough.

Since 1979, the state's Oil and Gas Conservation Commission has pioneered public regulation and supervision of U.S. arctic offshore oil and gas operations, and has laid the basis for Federal OCS regulation and supervision beyond Alaska's 3-mile territorial jurisdiction. This Commission's legal staff was quick to file objections to any assertion of NSB's planning and zoning or coastal management authority over existing exploration and production operations on state lands or in state territorial waters, but had stayed out of the arctic oil-spill preparedness debate. This was to change, however.

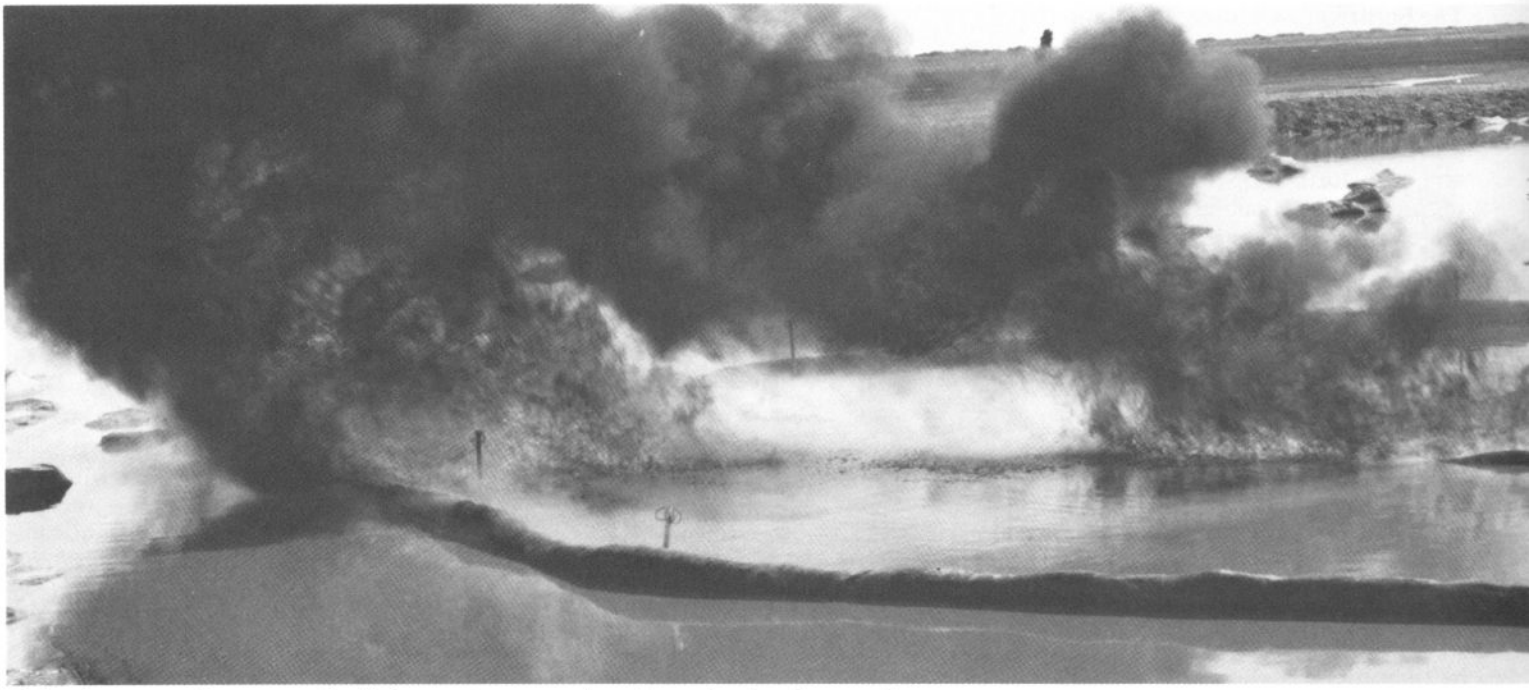
The Borough's Offshore Regime

In 1979, the NSB began building its own Environmental Protection Department under the leadership of Lester Suvlu to deal with such environmental concerns as the disposal of old millions of gallons of oil are stored within the boundaries of the North Slope Borough, most of it in containers and pipelines built upon shifting permafrost formations which make leaks inevitable. Preventing, controlling, and cleaning up oil spills in the Arctic is a responsibility shared by the NSB Department of Environmental Protection, and the Alaska Department of Environmental Conservation.

The borough's full-time oil-spill official is Joanne Loncar, a 7-year NSB employee who had watched AOGA dispose of the Beaufort oil-spill credibility gap by organizing the industry oil-spill cleanup cooperative, ABSORB (Alaska Beaufort Sea Oil Response Body). ABSORB was seen as a public relations campaign featuring a great deal of poorly-designed equipment and many high-gloss oil-spill contingency plans patently written to sell old and inadequate Mexican Gulf oil-spill recovery technology to Beaufort Sea operators. The Arctic had become a new market for old products.

The questionable adequacy of AOGA/ABSORB oil-spill recovery capability was addressed in 1981 by state Natural Resources Commissioner John Katz, who further compartmentalized offshore environmental risk assessment by granting Tier I permission to drill in the path of the bowhead whale. Tier-II permission would await industrial demonstration of industrial arctic oil-spill cleanup capability and further understanding of the acoustical impact of drilling upon the annual bowhead whale migration.

Under Tier-I regulations, exploratory drilling above threshold was generally permitted area-wide except during the fall



Right, observers at last summer's oil-cleanup demonstration: alarmed and embarrassed.

bowhead migration, during which time drilling may continue inside the barrier islands under certain conditions. Below threshold drilling was generally permitted area-wide from 1 November to 15 May, with open-water drilling permitted inside the barrier islands until the beginning of the bowhead migration. No drilling was permitted anywhere during the broken ice period.

As Shell and others prepared to continue to oil-bearing depth, their sole preparation for adequate oil-spill recovery demonstrations necessary for Tier-II permission was the AOGA/ABSORB public relations campaign, which was pressed into high gear for these demonstrations.

After a period of public debate about the wisdom of permitting Shell oil to demonstrate their ABSORB technology in actual Spring, broken-ice conditions, last summer the Alaska Department of Environmental Conservation decided to require Shell to demonstrate its oil-spill ignition capability in broken ice dumped in a gravel pit filled with sea water.

While observers watched in alarm, the crude oil failed to ignite in one demonstration and burned through and sank the containment booms in another. The ABSORB oil skimmer bobbed and wallowed ineffectually through its recovery simulations of a so-called "hypothetical oil-spill." NSB staff and environmental conservation groups who observed and videotaped these tests were embarrassed for ABSORB and very happy that the oil-spill ignition and recovery demonstrations had not been conducted offshore.

The December Summit Meeting

When Alaska Governor Bill Sheffield met with NSB Mayor Eugene Brower on 9 December 1983 they agreed to delay the Tier-II decision pending further work between federal, state, and borough oil-spill staff and specialists in a new ongoing planning process oriented toward overall oil-spill prevention, beginning with Tier-II negotiations.

In making this concession Brower allowed Tier-II negotiations to continue without focusing upon the failure of industry to demonstrate oil-spill cleanup in ice-infested waters, a condition required by state and federal policy before Tier-II drilling can proceed.

Although the decision as to whether and when oil operators can proceed with Tier-II drilling is left to Esther Wunnicke, Commissioner of Department of Natural Resources (DNR), Sheffield agreed to preside over further Tier-II negotiations himself, and asked John Shively to put together a Juneau meeting of all concerned, organized for January 12th.

Organizing Tier-II Strategy

NSB's Washington, D.C., legal counsel Sanford Sagalkin had conducted Tier-II negotiations leading up to industry's embarrassing attempts to demonstrate oil-recovery capability last summer. He regarded the Tier-II negotiations to be of key importance to the NSB's defense of the Beaufort Sea and the bowhead whale. Sagalkin was quarterbacked by Mayor Brower's special assistant Ralph Andersen, who began representing the borough on an inter-agency Tier-II steering committee which began meeting in January, 1983.

It was clear to Andersen and Sagalkin that Wunnicke would not delay Tier-II approval much longer on her own authority. Shell oil added heat to the issue by announcing its Seal Island discovery well, and the likelihood a new commercial oil discovery in in which the State of Alaska has a royalty interest made Tier-II

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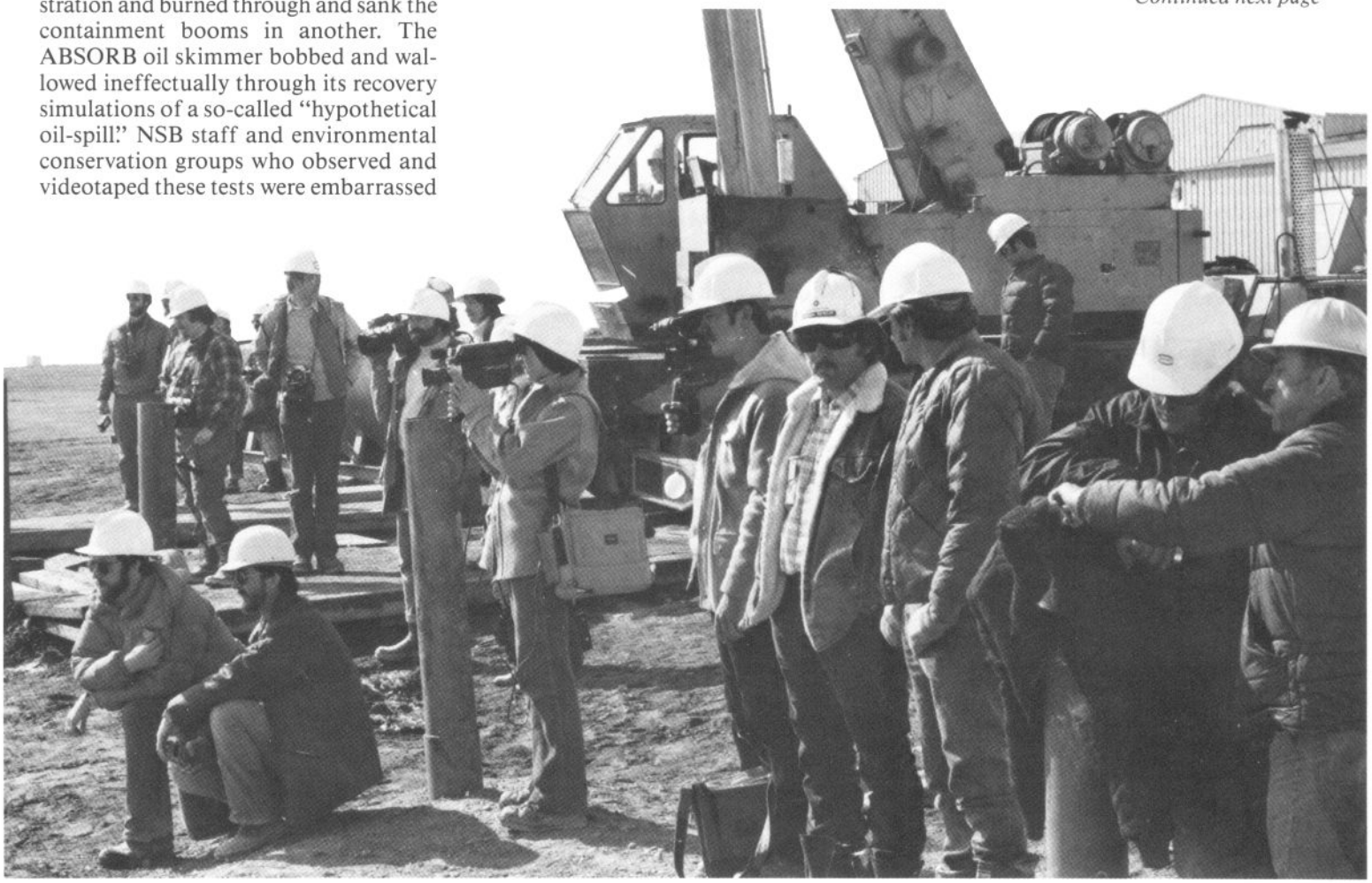


approval much more than of mere academic interest. Shell wanted Tier-II permission to drill confirmation wells.

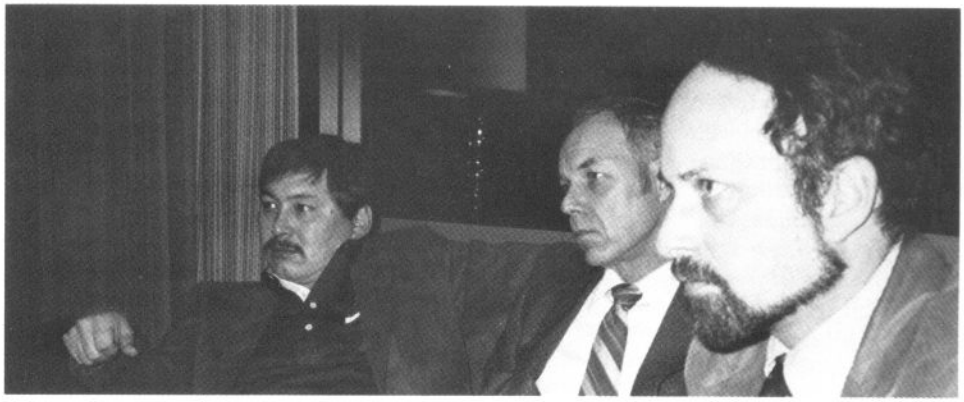
When Sagalkin perceived state officials were receiving advice from oil-spill expert consulting firms, he recommended the borough hire its own professional help. After making inquiries, he learned most oil-spill consulting firms were not interested in working for the North Slope Borough. An exception was found in Environmental Services Ltd., associated with Ernie Mueller—who as former state Environmental Conservation (DEC) Commissioner had formulated the double-tiered drilling strategy to allow exploration to begin while avoiding risk to the bowhead—and with Ray Morris, who was Chief of Oil and Hazardous Materials, Alaska EPA Operations Office until November 1981 when he was purged with other EPA officials identified by the Reagan administrative as "uncooperative" toward big oil. Working under Mueller's supervision, Morris was assigned to work the borough's case.

Earlier, the state had engaged the Canadian firm of S.L. Ross Environmental Research Ltd., recently organized by Sylvester Ross, a long-time Arctic oil-spill prevention-and-recovery chief for Environment Canada, who was an organizer of the land-mark Canadian 1970-75 Government/Industry Beaufort Sea Study and of the Canadian AMOPS, an on-going series of Ottawa consultative conferences on arctic oil-spill contingency planning. Ross was engaged to evaluate the summer demonstrations, and to make Tier-II recommendations.

While acknowledging the disappointing aspects of the summer demonstrations, Ross's report suggested Tier-II reconciliation might be reached by conditioning Tier-II approval by requiring operators to equip offshore wells with explosive well igniters for use in case of uncontrollable oil blowouts, rare in America's OCS exploration program. The decision to ignite the rig would be reserved to the State, not the rig operator. Sy Ross estimated this would prevent 95% of the oil from escaping into the water and allow the state and the borough to worry less about oil spills in ice-covered water.

The Governor's Meeting

The governor's meeting scheduled for 12 January was scratched at the last minute when a blizzard prevented industrial executives from attending.



Mayor Brower and Tier-II strategists Morris and Sagalkin at December Governor's meeting: the emphasis turned on prevention.

Brower, Andersen and Sagalkin were able to slip in before the weather shut down, and met with Sy Ross informally to discuss his ideas for improved oil-spill prevention measures in informal meetings. The meeting was re-scheduled the afternoon of 2 February 1984.

A few days before the meeting, an Anchorage-based based Coast Guard Officer admitted the impossibility to recover fuel oil spilled from a fuel tanker tied up at the Port of Anchorage. When the Anchorage press tried to get Mayor Brower to link the Anchorage oil-spill recovery failure with the Tier-II issue, he refused to cooperate, attempting to maintain a civil atmosphere for Tier-II negotiations.

When the meeting was convened, Ray Morris was introduced by Mayor Brower, and Morris spoke for a short period of time, asking that the meeting be followed up by a series of technical sessions aimed at fashioning a comprehensive state arctic oil-spill prevention policy.

He was followed by Dick Weaver of Exxon, leader of industry's 6-member delegation, who described with missionary enthusiasm the industry's primary and secondary well-control methods and asserted that the industry had never suffered an oil blowout from an offshore exploratory well in the history of the U.S. OCS program. He claimed that no more safeguards nor further development of state cleanup policy were necessary. He strongly opposed the idea of rigging state-controlled well ignition systems for use in case of blowouts, pointing out that the rig itself was the best place from which to regain control of blown-out wells. He disputed immediate blowout ignition would enable a 95% pollution prevention.

Weaver was followed by a loudspeaker telephone call from Chat Chatterton, Chairman of the state's Oil and Gas Conservation Commission, who also extolled the merits of industry's primary and secondary well-control methods. Weaver's presentation of the industry's well-control methods was very effective, and he warmed the room to an almost evangelical fervor as he minimized the chances of an arctic blowout, and dismissed the need for well ignition or other additional prevention measures. Brower responded to his presentation with positive warmth, and suggested if industry could make similar presentations to his constituents, it might help defuse public anxiety about the industry's inability to remove oil from broken ice.

Governor Sheffield closed the meeting by pointing out to all in the room the political importance of dealing with the Tier-II issue effectively, both statewide as well as along the arctic coast. The meeting broke up on a high note as if some difficult problem had been solved, but none had.

The Tier-II decision matter is being staffed at DNR by Robert Butz, who also wondered what should happen next after the Governor's warm but inconclusive meeting. He arranged to meet with NSB staff and consultants in Barrow on February 14th, when he went through the draft Tier-II decision point-by-point.

The Tier-II Technical Committee Meeting

On February 17, a Tier-II technical committee meeting was held in Anchorage. Morris attended this Technical Committee meeting hoping to begin working with other qualified experts to begin hammering out a deal. The only technically competent official present was Chat Chatterton, but the oil companies, the state and the federal agencies were represented by middle-level bureaucrats with no technical ability.

The meeting was dominated by DNR's Bob Butz, who frankly told Morris and the others that Commissioner Wunnicke had bent over backwards to consult with the borough on Tier-II, and would continue to do so, but unless new material was presented, she was ready to issue her draft Tier-II decision document. When Morris pressed for the ongoing State oil-spill prevention—policy negotiations sought by the borough, and for which there was no provision in the draft Decision Document, he was met with profound silence.

Following this meeting, newspaper articles appeared in Anchorage newspapers quoting Bob Butz asserting the state and the borough were close to agreement on Tier-II, and publicly disclosed his misunderstanding of Mayor Brower's Tier-II position. Annoyed, Brower wrote to Governor Sheffield to report their work to reach Tier-II agreement had "suffered a severe set-back" at the February 17th Technical Committee meeting. He also sent out a press release announcing his continued Tier-II opposition and disappointment in the lack of dialogue.

"Apparently, DNR is continuing their Tier-II decision-making process independently from our work to develop an oil spill prevention policy," the Mayor observed. "I feel compelled to insist that DNR halt its Tier-II approval process, and the State defer its Tier-II decision until we have fully completed our work toward a prevention policy," he said.

Following receipt of the Mayor's letter, Commissioner Wunnicke called Brower to hear for herself how he felt, and to express her regret for the premature press releases reporting near agreement. She then dispatched Bob Butz back to Barrow to sit down and listen to the borough's willingness to negotiate on a case-by-case basis, providing that the borough's role in state oil-spill prevention policy formulation is clearly defined in Tier-II stipulations.

The April Announcement

There was no communication from the offices of the governor or the DNR since the 17 February meeting, in spite of promises that Mayor Brower would be first to be notified of a decision. When Mayor Brower heard Commissioner Wunnicke's announcement in April that the state planned to lift the seasonal restrictions, he expressed his disappointment to the press saying, "The oil industry has done very little to prepare for Arctic offshore oil-spill emergencies, and tests last summer demonstrated the industry's inability to remove oil from broken-ice conditions, which prevail during the bowhead whale's annual migration. The seasonal drilling restrictions removed by the state were put into place by the Hammond administration to conform with requirements of the Endangered Species Act protecting the bowhead whale. We are consulting with our attorneys about a federal lawsuit under the terms of that act. We may have to sue, but I have not made that decision yet."

Would the borough have to go into court? In fact, the legal arsenal used in the environmental defense of the Arctic has been nearly depleted as a result of previous unsuccessful Beaufort Sea litigation in both State and Federal courts. Brower's legal advisers told him an Endangered Species Act suit would probably fail because only the Federal government is required to obey that law. And in Alaska's present political climate, a weak legal challenge would be bad politics.

Mayor's New Offer Accepted

As the date approached (May 17, 1984) when Shell's Seal Island confirmation drilling would have to shut down, serious negotiations began between DNR's Bob Butz and NSB's Tom Barnes, and Joanne Loncar. The result of these negotiations was Mayor Brower's letter of May 14, 1984 to Governor Sheffield in which he said "I am prepared to agree to year-round exploratory and production drilling below the threshold depth if the following issues can be satisfactorily resolved:

1. Successful boom deployment and maintenance.
2. Adoption of an adequate whale-monitoring plan.
3. On-site oil-spill containment equipment.
4. Adoption of an adequate well-ignition plan.
5. Industry commitment to a research and development program.

The following day, May 15, the State's Tier-II decision was published, providing for all of the Mayor's conditions, and the Seal Island discovery confirmation was able to continue operations.

Under the terms of the Tier-II decision, the Shell and other operators will have to participate in a five-year oil-spill research and development program to be overseen by the NSB and the State departments of Natural Resources and Environmental Conservation. And they will have to conduct a bowhead whale monitoring program to determine when drilling should cease to protect the bowhead migration, and both the NSB and the Alaska Eskimo Whaling Commission will be centrally involved in the design, conduct, and evaluation of this monitoring. ■

Annual NSB Bowhead Census

Underwater Acoustic Research Pioneering

From a distance, it looks almost like one of the whaling camps at the edge of an open-water lead used by the Inupiat subsistence whalers. But closer, it is noticeably different with the most essential piece of whaling equipment—a skin boat—not in sight.

This camp is essential to the scientists working on the North Slope Borough's 1984 Bowhead Whale Census Project. It is a 45-minute snow machine ride from the North Slope Borough's Science Building in Browerville. The trail first passes the demobilized Naval Arctic Research Laboratory (NARL), then snakes through sharp pressure ridges on the shore-fast Beaufort Sea ice to the research camp at the edge of an open-water leads. Located just beyond Pt. Barrow, this camp serves as a support base for the Census Project crew deployed at two "perches"—sighting stations on high-pressure ridges with a clear view of the open-water lead.

Sighting perch overlooking open-water lead of the Beaufort Sea: correlating sightings with underwater vocalizations.

Taking the Initiative in Bowhead Research

In 1977, the International Whaling Commission (IWC) imposed a ban on Inupiat subsistence whaling, based upon low bowhead population estimates. In response, the Inupiat whalers formed the Alaska Eskimo Whaling Commission (AEWC) and challenged these estimates as being based upon too little actual field research conducted by the federal government. During the next few years, bowhead population estimates made by the federal government were revised upwards as new information was gathered by the National Marine Fisheries Service (NMFS).

Unfortunately, federal funding cut backs have decimated the NMFS bowhead research effort. Since 1982, the responsibility for conducting this spring bowhead census has fallen upon the North Slope Borough. With funding assistance provided by the State of Alaska, the Borough has continued this census effort and is able to provide the AEWC with valuable bowhead population data.

In 1982, the NSB received State grant funds for the annual census and to help develop related marine bio-acoustic technology. The NSB contracted with bio-acoustic scientists Dr. William Cummings, Dr. Van Holliday and Dr. Ellison to conduct an acoustical-localization feasibility study. Data from this study, along with findings from another acoustical study conducted by Dr. Clark and Jim Johnson for NMFS, were presented in 1983 at the Borough's Second Conference on the Biology of the Bowhead Whale. The findings from these two studies began to convince some of the skeptics that bowhead whales could be electronically localized, as opposed to actual sighting from the ice edge or from survey aircraft. These preliminary studies serve as the basis for this spring's major acoustical localization research effort.

The 1984 Bowhead Census Project

In early February, the NSB's Environmental Protection Office began organizing the 1984 Bowhead Census Project. Arrangements were made for appropriate project personnel and logistical support.

Left, acoustic support camp. Below, EPO officer Ron Nalikak recording bowhead vocalizations.

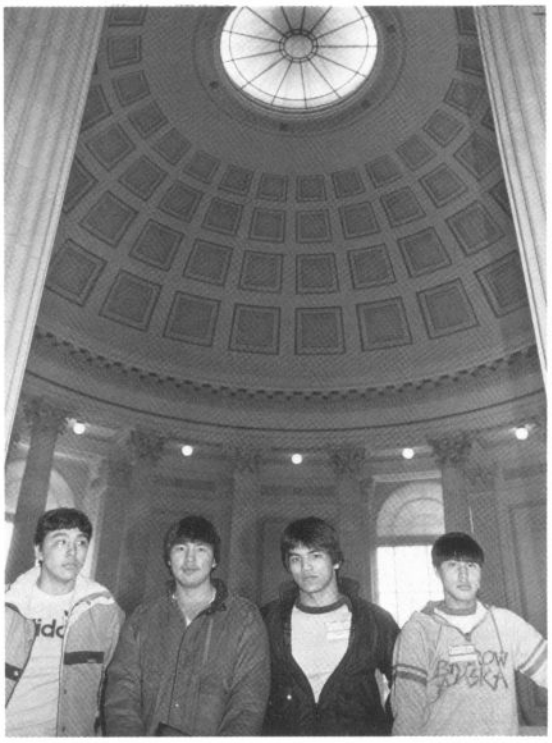
This year, an important part of the Census Project is the use of sophisticated electronic equipment to confirm the presence of whales, beyond the census personnel's range of vision, on their northward migration. Special bio-acoustic equipment is arranged in a small insulated "building" one-half mile from the open-water lead. Here, bowhead vocalizations, transmitted from four hydrophones submerged along the lead, are recorded. These hydrophones are placed over a distance of 1-2 kilometers, and must be relocated as the ice shifts with the wind and currents.

A special computer analyzes the transmitted sounds, and a bearing to the source is determined by calculating the time it takes a whale's sounds to reach each one of a pair of hydrophones. Using two pairs of hydrophones allows two bearings to be calculated. The point at which these bearings intersect is the precise location of the whale. This acoustical localization technique will help to achieve a better estimate of the proportion of the bowhead population that goes by unseen. An important aspect of this acoustic research is a precise statistical study designed to relate whale sounds to visual sightings. This study is being conducted for the Borough by Dr. William Ellison, Dr. Chris Clark, Kim Beeman and Bruce Krogman.

Each year, the results of the Borough's Bowhead Census Project play a major role in the negotiations between the AEWC and the federal government regarding the submission of bowhead population data to the IWC. Only preliminary visual and acoustical census data can be presented to the IWC Scientific Committee this year because the Committee is meeting earlier than usual, before the census project has ended. However, after detailed analysis, the visual and acoustical data will be presented for review by concerned scientists at the Borough's Third Conference on the Biology of the Bowhead Whale, scheduled for January 21-23, 1985 in Anchorage. After this thorough review, the bowhead population data will be available for use by the AEWC at the 1985 IWC meeting. ■

Inupiat Travel

Left and above, twenty-two students from the North Slope Borough were among the 500 from Alaska this year who participated in a ***Close Up*** *program in Washington, D.C., in March 1984.* ***Close Up*** *is a non-profit educational foundation that sponsored the week-long exposure to the capital and the political process. The students met with the Alaskan congressional delegation including Congressman Don Young shown here. Contributions from ARCO, Exxon, MAPCO, and Sea-Land helped pay their way.*



Below, dancers, singers, and drummers from Wainwright, Alaska, rehearse a segment of their upcoming performance in Los Angeles at the 1984 International Festival of Masks. The Festival of Masks, a cultural event of the Olympic Arts Festival, will be held prior to the 1984 Olympic Games. The Wainwright Dancers will be joined by Alaska Native athletes in presenting "Heartbeats of Alaska: Native Games and Dance" at several locations in Los Angeles in mid-July.

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