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Source: *Human Organization*, Summer 1982, Vol. 41, No. 2 (Summer 1982), pp. 97-106

Published by: Society for Applied Anthropology

Stable URL: <https://www.jstor.org/stable/44125887>

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Introduction

MUCH OF THE RESEARCH examining the effects of energy development on Indian and Eskimo groups concludes that such resource extraction projects bring few real benefits to local communities. Reviewing the impact of the Navajo Tribal Council's leasing of oil, natural gas, helium, and coal to energy corporations, Robbins (1978) argues that these sales have improved the economic position of only a small group of tribal members. This appears to be due primarily to the fact that total energy industry employment is quite small compared to the total Navajo work force. In 1977, these industries employed 1800 Navajo workers, 60% of the total industry employment. Such a high proportion of Native American employment in energy projects is quite unusual. Anders (1980) points out that during a period of intensive energy development, reservation unemployment actually increased for the majority of tribes that are members of the Council of Energy Resource Tribes. Yet, even where Indians gained employment, these Navajo jobholders represented less than 3% of the work force. Thus, the effect of energy employment among the Navajo was to create a small elite of high wage earners.

While few Navajos have been directly employed by the energy industry, the Navajo tribal government has received revenues from energy-related royalties, rents, leases, and bonuses. Indeed, 70% of tribal revenues derived from mineral leasing, a situation that places the tribal government in a weak bargaining position when its interests may call for canceling leases or refusing to negotiate new leases (Ruffing 1978). Again, however, the payments have not been large (\$16.3 million in 1977) and reflect prices that are far below fair

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Human Organization, Vol. 41, No. 2, 1982
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0018-7259/82/020097-10\$1.50/1

market value for the resources extracted (Jorgensen 1978; Owens 1979; Ruffing 1978).

The impact of energy industry wages and tribal government payments on the Navajo economy has been further diminished by the fact that most expenditures are made off the reservation to non-Indian businesses (Owens 1978). While Navajo mean per capita and household incomes have increased since 1970 due to the earnings of a small group of high wage earners, the median Navajo household income has actually declined. In other words, a major effect of energy development among the Navajo has been to increase income inequality (Arthur 1978).

Research on the impact of energy development projects in Canada suggests a similar pattern of outcomes for Indian and Eskimo groups. The major potential benefit is employment opportunities in energy industries, and these jobs are not necessarily structured so that Native groups can take advantage of them. While some Indians have been employed in oil sands extraction plants, the Native communities in the Athabasca Oil Sands Region continue to experience high rates of unemployment and underemployment (Nichols 1979). Indeed, the proportion of the Native adult population who are employed has not risen despite the construction and operation of major oil sands plants in the region. During this period as well, Native incomes have declined as a proportion of the provincial average. In short, economic activity in the region resulting from energy development led to the growth of a large, prosperous White settlement, Fort McMurray, and bypassed the rural Native communities.

Examining noneconomic effects of these energy projects on Alberta Native communities, Justus and Simonetta (1980) contend that not only has the Indians' standard of living failed to increase but also that these communities have experienced increased alcohol and drug abuse, greater violence, and more family breakdown. In addition, Indian respondents reported declines in the availability of fish and game in the oil project area (Justus and Simonetta 1979). It is not clear from this research, however, to what extent such changes represent general historical trends as opposed to specific effects of energy development.

Under certain conditions, however, energy development may have positive effects on Native communities. One such example, although quite limited in scope, is Gulf Oil Canada's rotation employment program, in which Inuit men from the community of Coppermine worked at drilling sites for two-week periods followed by a one-week home break. Kupfer and Hobart (1978) report almost unanimous approval of the project on the part of the Inuit interviewed. The project brought the community substantial income, which was primarily spent on family necessities and hunting equipment. Moreover, wage

work did not reduce the supply of Native foods. The men continued to hunt between their periods of work, increasing their hunting effectiveness with investments in better equipment. While alcohol consumption and violence did increase at the beginning of the employment program, these were transitional effects (Hobart nd). On balance, the effects of the work program appeared quite favorable.

The Coppermine case presents a hopeful sign for improved relationships between energy developers and Indian and Eskimo groups. In most cases, however, the well-being of the Native American population has not been improved by the energy development. The present study offers an illustration of an instance where the economic well-being of the general population did improve. This situation has some aspects that are not common in other Native American experiences with oil development. First, actual oil field activities occurred 96 km away from the nearest Inupiat settlement. Second, the North Slope Inupiat were able to gain local property taxing authority by creating a regional government. Native Americans on reservations are currently attempting to gain such taxing authority. However, knowledge of this instance may increase the ability of tribal units and pan-tribal organizations such as the Council of Energy Resource Tribes to deal effectively with the opportunities and difficulties presented by resource development.

The Study

This study examines the effects of oil development at Prudhoe Bay on the Inupiat population of Alaska's North Slope. The Inupiat population consists of about 4000 persons of whom slightly over half are adults. Approximately 2800 individuals, mostly Inupiat, live in the regional center, Barrow. The remainder of the population is located in seven predom-

inately Inupiat villages of less than 500 residents each. Using the opportunity to obtain tax revenues from oil properties, the Inupiat established a Native-controlled local government, the North Slope Borough (see Figure 1). In 1973, the borough's total budget was \$528,000. Six years later, the annual budget grew to almost \$60 million (McBeath 1981). Sixty percent of the borough's revenues in 1979 came from property taxes, which the borough, as a local government, placed on oil properties, while the next largest category (24%) came from inter-governmental transfer payments. The borough government also launched a \$511 million capital improvement program (CIP) to improve schools, roads, housing, sanitation, and other public facilities. Through local hiring programs in both the CIP and government operations, the borough employed over half the Inupiat population. Median household income rose while income inequality did not. The Inupiat community also experienced increases in traumatic death and declines in traditional community values. However, these changes appear to be a continuation of long-term historical trends. It is not clear that these problems are specific impacts of resource development.

This study was supported through the National Science Foundation's "Man in the Arctic Program" (MAP), a six-year project designed to examine the effects of oil development on Alaska's urban and rural populations. This paper presents information on social and economic effects of energy development on Inupiat individuals and households. The data derive primarily from a household survey conducted in 1977 by the Institute of Social and Economic Research in cooperation with the North Slope Borough. In addition, public health and other agency records were used to examine changes over time in alcoholism, traumatic death, and other social problems. Other studies within the MAP program examine Inupiat political organization and the economic development of the region.

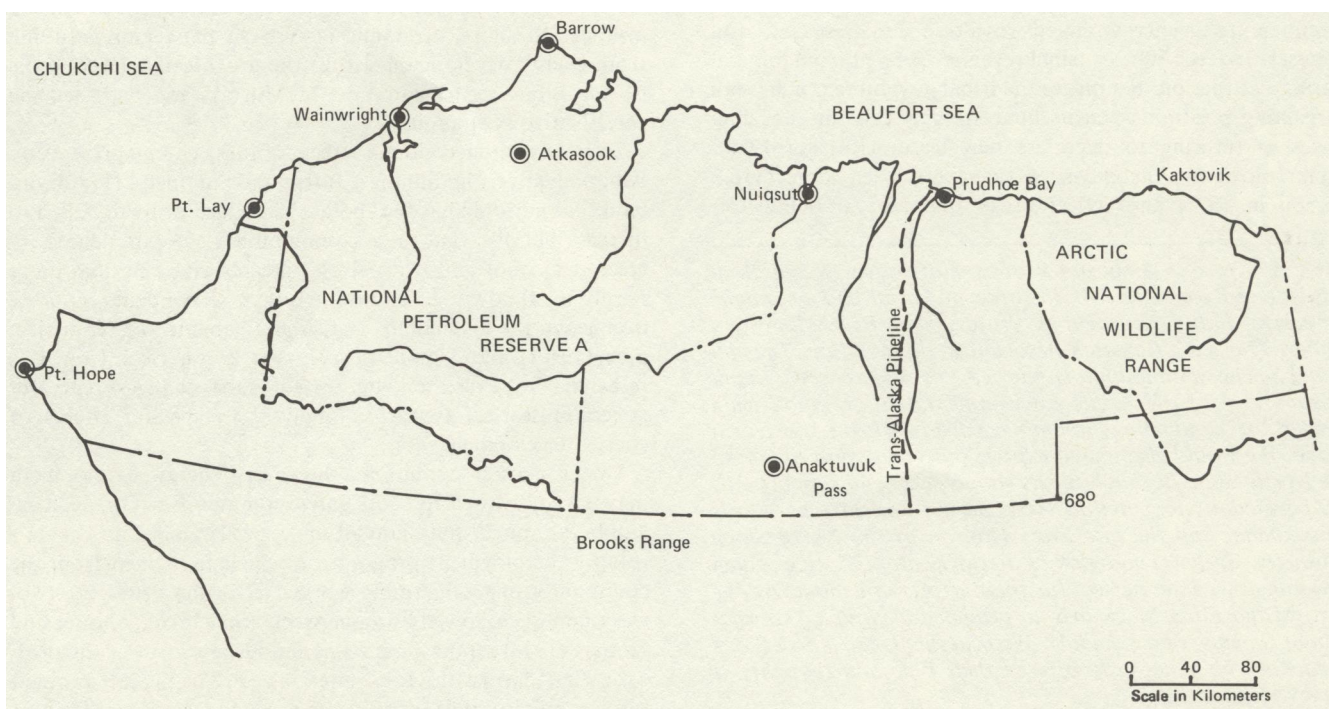


FIGURE 1. NORTH SLOPE AREA

METHODS. The results reported in this paper are based on the responses of 290 Inupiat adults to an hour-long personal interview. Before the structured sample survey was administered, 30 individuals participated in in-depth interviews designed to refine our research hypotheses. In addition, we were able to benefit from an analysis of the results of a survey we conducted in another rural region in Alaska (Gasparro 1978). Draft interview questions were reviewed by Inupiat leaders and were pretested among Inupiat residents. An Inupiaq translation of the revised interview schedule was prepared and Inupiat residents were hired and trained as interviewers.

We selected all households in the communities of Point Hope, Wainwright, Nuiqsut, Kaktovik, and Anaktuvuk Pass and a 50% simple random sample of all noninstitutional households in Barrow. Two small North Slope communities, Point Lay and Atkasook, were not surveyed since they were being resettled. Within selected households, we randomly designated an adult member of the household (18 years or older) to be interviewed.

Interviews were conducted from October, 1977 to February, 1978. Respondents received \$10 for their assistance. The final sample consisted of 75% of the 385 selected respondents. Twenty-four percent of our respondents chose to take the interview in Inupiaq. Non-Native interviewers conducted a small proportion of the Barrow interviews and the Inupiaq version could not be used in these households.

In presenting survey results, the Barrow interviews are weighted to reflect the proportion of Barrow adults in the total North Slope Native population. Sampling errors for responses involving the entire sample are about 4%. The interview schedule itself covered four major areas: wage employment, subsistence, community living conditions, and personal background characteristics. Factual self-reports of current and past behavior form the core of the first two sections while perceptions concerning 14 community characteristics and 7 institutions are the primary question form in the third section. The final section of the interview schedule contains questions concerning living experiences outside of the region and childhood exposure to wage and subsistence activities, as well as a complement of questions concerning income, expenditures, and education. A comprehensive statistical presentation of the results is available (Kruse, Kleinfeld, Travis, and Leask 1981), as are separate monographs on employment (Kleinfeld, Kruse, and Travis 1981), subsistence (Kruse 1982), social problems (Travis 1981), and institutional development (McBeath 1981).

Historical Background

ENVIRONMENTAL SETTING. Alaska's Brooks Range forms the southern boundary of a 228,800 km² area referred to as the North Slope. The arctic foothills of the Brooks Range give way to a flat coastal plain containing thousands of small lakes and both wet and dry tundra. Despite low average levels of biological productivity in the region and its surrounding waters, bowhead whale, walrus, seal, caribou, Canadian geese, eiders, and sandpipers along with numerous other shorebirds and waterfowl seasonally migrate through the region. The availability of and access to resources is limited by the severe arctic winter, however, where the chances of wind chill temperatures of -30°C are 50% or greater during six months of the year.

POPULATION AND TRADITIONAL ECONOMIC BASE. The harsh climate and often meager availability of resources limited the aboriginal population to perhaps five thousand. These people consisted of two societies. The Nunamiut ranged across the Brooks Range and arctic foothills, basing their economy primarily on caribou. The coastal environment was exploited by the Tareumiut, who formed villages in locations affording good hunting opportunities for migrating sea mammals. Men were the primary hunters in both societies with women providing support to the men's subsistence activities.

SOCIAL ORGANIZATION. As in most traditional societies, material insecurity was a strong incentive to engage in group activities that minimized individual risk (Dalton 1971:11-12). Food sharing among related households was widespread. Social status depended not only on wealth but also on generosity. Group bonds were strengthened by the need to hunt caribou and the large marine mammals collectively as well as by the instruction of the young men in hunting techniques given in village ceremonial houses. Traditional religious beliefs primarily concerned human-environment relationships perceived as critical to hunting success.

REGIONAL INTRUSIONS. Apart from the intrusion of foreign trade goods and numerous arctic explorers in the 18th and 19th centuries, the first major outside contact occurred during the period of commercial whaling in the arctic (ca. 1854-1906). Missionaries and the establishment of shore trading stations followed soon after the first commercial whalers arrived. The next major intrusion came with the search for national oil reserves during and after World War II (1946-53). Oil exploration activities were closely followed by the construction of Defense and Early Warning (DEW) line facilities. During the 1960s the impact of national and state poverty programs aimed at upgrading the quality of health, education, transportation, and other community services was felt on the North Slope. Most recently, the presence of substantial oil fields has heightened outside interest in the North Slope region.

EFFECTS OF EARLY INTRUSIONS ON ECONOMIC ACTIVITIES. The whaler's need for meat added a commercial value to subsistence resources. Men sought caribou meat to obtain Western foods and trade goods as well as for food. The commercial whalers also competed with Native whaling captains for labor, thus introducing wage employment to the North Slope (Sonnenfeld 1957:235). The drop in price of baleen in the early 1900s was not followed by a complete resurgence of traditional hunting patterns. Men also turned to natural resources having a commercial value: fur bearers and reindeer introduced by missionaries and the federal government.

When male wage employment opportunities again increased in the 1940s, the village of Barrow attracted residents from throughout the region. Although the new wage employment opportunities did not seriously conflict with hunting opportunities, preferences for Western food were exercised and per capita consumption of Inupiat foods significantly dropped (Sonnenfeld 1957:544). Whaling, however, increased. The number of whaling crews was traditionally limited by the wealth present in the community. Wage employment provided a new means of obtaining wealth, particularly because the whaling equipment could now largely be purchased rather than

slowly amassed through past successful hunting efforts (Van Stone 1962:42). Interest in whaling probably remained high for several reasons. First, more secure food supplies increased the relative attractiveness of whaling over traditional mainstays of the subsistence economy, seal and caribou, both of which provided little meat per kill. Second, active whaling consumed only a few weeks a year and could be fit among other activities. Third, and perhaps most important, whaling continued to involve a large segment of the community and remained the most visible tie to traditional Inupiat activities (*ibid.*:165).

During the 1950s and 1960s, the DEW line and government construction programs sustained wage employment opportunities in construction. These jobs continued to be taken primarily by men. Women, however, started to enter the labor force as education, health, and other government service jobs appeared.

EFFECTS OF EARLY INTRUSIONS ON SOCIAL ORGANIZATION. The attachment of commercial values to subsistence resources presented a conflict between traditional sharing obligations and the desire for Western foods, housing, and clothing (Sonnenfeld 1957:253). An individual who wished to take advantage of the new commercial hunting opportunities could now do so with a rifle instead of relying on group effort (*ibid.*:239). Whereas Inupiat hunters traditionally linked their success to an adherence to religious practices, they increasingly came to depend on the use of new technology. This, along with missionary pressures, led them to abandon practices with affirmed traditional religious beliefs. The Barrow community dismantled the ceremonial houses and no longer publicly recognized traditional religious leaders. The Presbyterian church became the predominant social organization, thus introducing residents to a prototype form of modern political organization.

Along with new technology and a new religion, Westerners introduced diseases and alcohol. Flu, measles, pneumonia, and tuberculosis epidemics decimated the population, dramatically reducing the viability of the individual household as a social and economic unit. In addition, alcohol misuse led to accidents and violent deaths and removed the will of many residents to engage in productive activities (Brower, Farrelly, and Anson 1942). When health conditions finally improved in the 1950s, high birth rates and low death rates dramatically increased the number of household dependents. The children of the baby boom of the late 1950s and early 1960s reached working age during the mid-1970s, the period of central interest to this study.

THE PRUDHOE BAY DISCOVERY AND FORMATION OF THE NORTH SLOPE BOROUGH. The discovery of oil on state leased lands at Prudhoe Bay in 1968 set into motion massive investments in oil production and transportation facilities. Employment at Prudhoe Bay exceeded 6,000 during the peak construction period in 1975 and has averaged over 3,000 since then. Thus the employment generated at Prudhoe Bay has been comparable to the size of the entire North Slope Inupiat population. Despite the tremendous employment potential at Prudhoe Bay, actual employment and income effects of the development have not been large. In contrast to the Navajo experience, however, the Inupiat have been able to capture and exploit substantial sums of oil-related wealth. The formation

of an Inupiat-controlled regional government empowered to tax property and to provide a wide spectrum of facilities and services accounts for much of this difference.

As the oil industry geared up for production, several young Barrow Inupiat formed the Arctic Slope Native Association (ASNA) to press a Native claim to the entire North Slope (McBeath 1981). The land claims movement gained momentum and the ASNA broadened its objectives to include calls for jobs, housing, and schools. Thus, the ASNA not only contributed to the statewide land claims movement but also established the need to form a regional government (*ibid.*).

The state opposed the formation of the North Slope Borough, viewing Prudhoe Bay oil as a statewide tax resource. Oil companies wanted to limit and stabilize their tax liability and fought the borough in the courts (Morehouse and Leask 1980). Following extended litigation, Native leaders succeeded in establishing the borough and its taxing authority in 1972 and soon began planning the multimillion-dollar CIP designed to provide local employment and to construct village facilities. Property taxes paid by North Slope Oil producers will pay for virtually all of the CIP program.

In addition to Prudhoe Bay oil development and the formation of the North Slope Borough, the Alaska Native Claims Settlement Act established a third major development force in the region, the Arctic Slope Regional Corporation (ASRC), which will receive almost 1.6 million ha of land and about \$52 million. Eventually the regional impact of ASRC investment activities may exceed the impact of borough tax revenues. However, since 1972, the borough has received revenues equal to three times ASRC's share of the 1971 Settlement Act and is spending rather than passively investing these moneys. Of the two Native-controlled development forces, the North Slope Borough has clearly had the greater impact at this point.

The establishment of the North Slope Borough and the Arctic Slope Regional Corporation marked the end of a colonial era that lasted 120 years. While regional resources are still sought by state and national interests, the two Native organizations now have the power to influence outside forces for change and to institute changes themselves. Our central research question is thus how oil development has changed the lives of the Inupiat residents both directly as a result of the new employment opportunities and land use and indirectly through the mediating influences of the North Slope Borough and to a lesser extent, the Arctic Slope Regional Corporation.

Population Effects

Aside from producing tax revenues, the Prudhoe Bay oil development itself had little direct impact on the North Slope Inupiat. All employee housing and support services were provided at the site and most workers took direct flights between the enclave and hiring points in Anchorage and Fairbanks. The nearest Inupiat settlement is 96 km from Prudhoe Bay and virtually no intraregional surface travel routes pass through the area. As we discuss below, there is little evidence that the Prudhoe Bay development itself adversely affected wildlife populations.

EMPLOYMENT. Between 1970 and 1977, only 14% of Inupiat adults had worked for the energy industry and just 8% had worked for longer than 12 weeks. The existence of borough

jobs paying comparable wages in the villages doubtless made the employment opportunities at Prudhoe Bay less attractive. However, even without competing local job opportunities, direct Inupiat participation in the energy development would probably not have been substantially higher. Personnel records for the construction phase of the trans-Alaska pipeline, for example, indicate that 17% of the adult Native population worked on the project and more than half of these persons worked only for 8 weeks or less (Naylor and Gooding 1978). Thus, despite the large scale of oil development activities in Alaska, direct benefits to Alaska Natives have not differed greatly from the experience of other Native groups with energy development. The formation of the borough, however, led to major gains in employment and income for a large proportion of the population. The Inupiat government transformed oil revenues into local high-paying jobs.

By 1977, five years after it was established, the North Slope Borough was the largest employer of the local Inupiat population. Almost half of the jobs held by Inupiat adults came from the borough government and school district. The borough had at some time employed about 57% of the Inupiat adult population. Most men were employed as construction workers in the CIP program. While the borough contracted with outside firms to manage construction projects, actual construction work was performed by borough employees. In this way the Borough was able to implement a strong local hiring program.

The number of jobs related to general government operations increased as well, opening up new opportunities for Inupiat women. The borough also adapted the structure of its jobs to minimize conflicts with contemporary Inupiat lifestyles. For example, the borough had a policy of granting leaves of absence for subsistence activities, and employees irregularly absent from work were generally rehired. Borough pay scales were high. The average weekly wage of North Slope Inupiat adults in 1977 was almost \$500 per week and about 25% received weekly paychecks of \$800 or more. Inupiat residents viewed the increase in the "number of good jobs you can get" as the single most positive change in community conditions that had occurred on the North Slope since 1970, before energy development. In 1977, almost 68% of Inupiat rated the job situation as favorable, while only 33% considered the job situation favorable in 1970. Residents who did not see wage work opportunities as improving, primarily lived in villages without major borough construction projects during our survey year.

Borough jobs did not succeed in eliminating unemployment among the Inupiat population. During 1976-77, unemployment among adults in the primary working ages (18-54) averaged 12% of the total male population and 8% of the total female population. In addition, an average of 32% of the male population and 26% of the female population were intermittent workers temporarily withdrawn from the labor force. Even during the month of peak employment (September) in the survey year, only 68% of the total male population between ages 18 and 54 and 52% of the female population in this age group were employed. While Inupiat women's labor force participation was close to the national female average, the labor force participation of Inupiat men remained far below national norms.

These moderate employment/population ratios resulted

from three major factors. First, Inupiat men were primarily blue-collar workers (81%) who were vulnerable to being laid off as particular construction projects ended. Of male job terminations, 39% resulted from lay-offs. Second, many Inupiat did not want year-round wage work. In response to a survey question about preferred work schedules, about 50% of Inupiat males and 52% of Inupiat females said they would prefer to work part of the year. Third, large numbers of young Inupiat adults who were born in the 1950s and 1960s were entering the economy in the 1970s and swelled the numbers of Inupiat adults in the labor force. However, the borough was important in providing jobs for these young adults. Among 18-24 year olds, 75% had received employment from the borough.

While the borough provided wage work to a large proportion of the population, the periods of employment were not typically long, due to lay-offs and personal preferences for part-year work. Inupiat men employed by the borough received, on the average, 17 weeks of employment, and Inupiat women, 23 weeks. Thus, the effect of borough jobs was to distribute some employment to a large proportion of the population, rather than to provide high-paying jobs to a small group.

INCOME. Higher wage rates and increased female labor force participation caused real incomes to rise at an annual rate of 6.5% between 1970 and 1977. In 1977, the median Inupiat family income was \$17,347 (Table 1). The North Slope Borough was clearly successful in using oil production profits to increase the economic well-being of the general population. Equally important, the North Slope region has so far avoided increasing disparity in incomes, a common trend among regions experiencing rapid economic change. The poorest 20% of North Slope residents earned 3.5% of the total regional household income in 1977 and 3.6% in 1970. The North Slope

TABLE 1. NATIVE FAMILY INCOME: 1960-77

Income	1960	1970	1977 ^a
Under \$2,000	34%	14%	3%
\$2,000-\$5,999	39	31	14
\$6,000-\$9,999	27	23	10
\$10,000-\$14,999	—	21	16
\$15,000+	—	11	57
	100%	100%	100%
Median Family Income:	\$3,438	\$6,923	\$17,347
Adjusted Median Income: (1960 Dollars) ^b	\$3,438	\$5,700	\$8,982
Number of Families:	(237)	(451)	(260)

^a The \$15,000 + category for 1977 when broken down further shows 14% of households with incomes between \$15,000-19,999, 21% between \$20,000-29,999, 10% between \$30,000-39,999, and 12% with \$40,000 or more.

^b Median income was adjusted using the Consumer Price Index for Anchorage. As such, the adjusted income should be interpreted as a crude approximate to North Slope Native household income in actual dollars.

Sources: U.S. Bureau of the Census, 1960 Census of Population, Alaska; U.S. Department of the Interior, 2(c) Report: Federal Programs and Alaska Natives, 1973; ISER North Slope Survey, 1977.

income distribution is only slightly more unequal than Alaska or the United States as a whole.

The North Slope Borough enabled the Inupiat to share in the general growth of income in Alaska brought about by oil development. North Slope families experienced the same proportionate increase in income (2.5 times) between 1970 and 1977 as Alaskan families in general and exceeded the gains made by all U.S. families.

While incomes have increased rapidly and proportionately across the North Slope population, they are still far below urban Alaska. The average unadjusted per capita income in Fairbanks, for example, was \$11,291 in 1976, compared to \$3,745 among North Slope Inupiat. Twenty-nine percent of the North Slope Native population received incomes below the poverty level established by the U.S. Department of Agriculture Economic Food Plan Program in 1977.

SUBSISTENCE. The income gains experienced by North Slope residents were clearly not sufficient to eliminate the need for subsistence activities. Despite the availability of wage employment, most adults continued to engage in subsistence pursuits. In fact, 70% of all Native adults engaged in one or more subsistence activities in the 12 months preceding the survey. Respondents in 45% of the households perceived that half or more of their food came from these activities.

Subsistence activities were important even in households with incomes of \$25,000 or greater. Indeed, men in such households reported engaging in subsistence activities during more months of the year than men in households with incomes below \$25,000 (6.1 compared to 3.6 months, $p < .01$).

This positive relationship between income and subsistence activity is understandable in view of the increasing dependence on purchased equipment. Increased incomes were also used to widen the variety of subsistence products pursued. Men in households with incomes of \$25,000 and over engaged in more subsistence activities than other men as well (4.8 compared to 2.9, $p < .01$). In short, the higher cash incomes resulting from oil development and borough formation, far from depressing subsistence interest, were related to heightened and more varied subsistence activities.

Changes in subsistence technology also dramatically reduced the time necessary for many subsistence activities, mak-

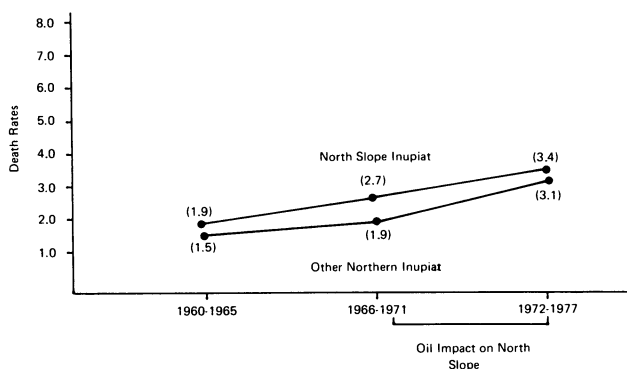
ing it possible for Inupiat to combine wage work with a high level of subsistence effort. Respondents reported that 60% of all subsistence activities took place after work or on weekends. Another 7% occurred on leave or vacation time. One-half of the trapping and two-thirds of the seal hunting took place on weekends, after work or on leave time.

Despite the evidence of continued need and desire for subsistence products, most Inupiat adults (63%) reported that they spent less time on subsistence activities in 1977 than in 1970, and 75% said that they obtained fewer subsistence products in 1977. Whereas 82% of the adult population recalled that the amount of fish and game in their area was good or very good in 1970, only 27% made the same assessment in 1977. The major reason given for the reduced subsistence resource take, then, was related more to the availability of resources than to the time available to hunt and fish.

The role of onshore petroleum development in the decline of regional fish and game populations, if it exists, appears to be quite indirect and an effect of increased Inupiat income rather than severe degradation caused by development. One-fifth of our respondents did mention that they thought development activities have adversely affected wildlife populations or their habitat. Most respondents, however, felt that they needed more information to make an assessment. The size of the Central Arctic caribou herd, which occupies the Prudhoe Bay area, has not declined since development activities started, but researchers and local residents have observed that some migrating caribou, particularly cows accompanied by calves, tend to avoid the pipeline corridor (Davis 1980; Cameron and Whitten 1979; Finkler 1979). In addition, the quality of some streams was reduced as a result of inadequacies in the design and construction of the pipeline (Morehouse, Childers, and Leask 1978).

Most of the affected wildlife resources, however, were not among those heavily used by the Inupiat population. Village residents primarily take caribou from the Western Arctic and Porcupine herds rather than the Central Arctic herd. Both the Prudhoe Bay oil field itself and the pipeline corridor are about 80 km from the nearest village, so local wildlife resources have not been reduced. The effects of future outer continental shelf oil exploration and production activities in the Beaufort Sea on key subsistence resources may, of course, be entirely different.

The immediate reason for our respondents' negative assessment of hunting and fishing conditions in 1977 was a state restriction placed in 1976 on harvests of the Western Arctic caribou herd. In 1975, the Alaska Department of Fish and Game estimated that 20,000 caribou were harvested from the herd and that the population level had dropped from about 242,000 in 1970 to 75,000. Inupiat hunters and state biologists disagreed about the amount of the decline and its precipitating causes (Davis, Valkenburg, and Reynolds 1979). The biologists maintain that overharvesting was a major cause for the decline. We noted that higher income is related to higher time spent on subsistence and time spent on subsistence may be positively related to subsistence harvesting as well. We cannot confirm the latter relationship without harvest data. If true, however, a connection might be drawn between oil development, the higher incomes it indirectly provided, purchases of equipment and supplies that permitted individuals to acquire



*Traumatic Deaths include suicides, homicides, accidental, and alcoholism deaths.

Source: Alaska Department of Health and Social Services, Office of Information Systems, 1980.

FIGURE 2. TRAUMATIC DEATH RATES OF NORTH SLOPE INUPIAT COMPARED TO OTHER NORTHERN INUPIAT: 1960-77 *

preferred foods and to engage in preferred activities, and, finally, increased harvest pressure on subsistence resources.

Caribou hunting was not the only subsistence activity to receive public attention since oil development activities began. Higher incomes meant that more men could afford to form whaling crews. The larger number of crews and expanded whale harvest attracted the attention of some members of the international scientific community. In 1978, the International Whaling Commission directed North Slope whalers to take no more than 12 bowheads instead of an annual average of 29 taken between 1970 and 1977. While caribou hunting restrictions have been recently eased as herd sizes have increased, the bowhead controversy continues.

As we have seen, subsistence activities continue to play an economic role on the North Slope. The data also suggest that food and activity preferences are likely to continue to involve subsistence activities even as incomes increase. The basis for these preferences appears to be broader than the individual. Traditional norms regarding the sharing of subsistence products continue. Sixty-four percent of Inupiat households distributed food to 77% of Inupiat households. Forty-eight percent of Inupiat households gave or lent money or equipment to others for subsistence activities. The spring whaling festival, Nulukutok, continues to be the single most important expression of Inupiat cultural identity. Given disturbingly high levels of alcohol abuse and other signs of social adjustment difficulties discussed below, the stabilizing role of subsistence may in the long run be as important as its economic role.

SOCIAL PROBLEMS. The North Slope has been the subject of numerous articles in national publications which contend that oil development has created high levels of social problems and undermined Inupiat cultural stability. In addition to these journalistic treatments, a major study conducted by the Center for Research on the Acts of Man (Klausner, Foulks, and Moore 1980) argues that the high and rising rates of alcoholism, suicides, and other types of social problems on the North Slope are an indirect result of oil development. According to this argument, oil development has concentrated new wealth and power in a small group of Inupiat who have the competencies to deal with Western bureaucratic institutions.

Inupiat adults indeed perceived serious social problems in their communities and also a general deterioration in the social fabric of community life since the 1970s. In 1977, for example, only 4% of Inupiat adults viewed the levels of drinking, drugs, fighting, and stealing in this village as good, whereas 36% perceived the levels as good in 1970. As Figure 2 shows, death rates from such causes as suicide, homicide, alcoholism, and accidents indeed rose on the North Slope during the period of oil development.

The central issue, however, is whether this increase represents effects of oil development or a continuation of a historical trend that began well before oil development. To explore this question, we examined trends in traumatic death rates on the North Slope since the 1960s. We also compared the rate of change and level of traumatic death on the North Slope from the 1960s through the late 1970s with that of a neighboring Inupiat region, which has experienced much less impact from energy development and a much slower rate of economic change.

If oil development was directly or indirectly responsible for

the increase in traumatic death rates during the late 1970s, we would expect to see such patterns as (1) a higher absolute level of traumatic death on the North Slope compared to the neighboring Inupiat region; (2) a steeper increase in traumatic death during the late 1970s on the North Slope compared to the neighboring Inupiat region; and/or (3) an increasing rate of traumatic death on the North Slope during the late 1970s compared to the 1960s. As Figure 2 shows, none of these patterns appear. The traumatic death rate on the North Slope increased to an even greater degree during the period before oil development, 1960 to 1971, than it did between 1971 and 1977. The rate of increase in the neighboring Inupiat region was substantially higher during the late 1970s than it was on the North Slope. Moreover, the absolute level of traumatic death on the North Slope in the late 1970s was only slightly higher than in the neighboring Inupiat region and it has been somewhat higher since the 1960s. While social problems may indeed be related to long-term economic and structural changes in Inupiat culture, these patterns do not suggest that energy development itself caused or accelerated social disorganization on the North Slope.

Alcoholism (and its consequences, such as in suicide, homicide, and other violent crime) is a serious community problem. We defined a "problem drinker" as (1) any person who was arrested on a criminal charge while intoxicated; and/or (2) any person who was held at least once during the year in the Barrow detention program, essentially a sleep-off center. Using this criterion, about 21% of the Inupiat adult population in Barrow can be considered drinkers who require intervention from the community. These problems are concentrated in males, particularly males in the 18-24 and 35-44 year old age groups. Severe drinking is also related to the high rate of homicide on the North Slope (30.7 per 100,000 between 1972-77), compared to the total U.S. population (9.6 per 100,000 during this time period). It is worth noting that while the pattern of change for suicide and accidental death on the North Slope suggests a continuation of historical trends, the region has experienced a large increase in homicide compared to earlier periods (5.2 per 100,000 between 1960-71). The comparison Inupiat region did not show such a dramatic increase in homicide during the 1970s. However, it should be kept in mind that these North Slope homicides are concentrated primarily in two Inupiat families and are not a communitywide phenomenon.

COMMUNITY CONDITIONS. By 1977, the borough had been in existence for five years and had spent over \$99 million in capital improvement projects, education, and general government operations. How did Inupiat residents evaluate the changes in community conditions that had occurred since 1970, before energy development and the formation of the borough? Inupiat adults saw a mixed picture of positive and negative change. The greatest perceived benefit was the creation of jobs (Figure 3). In addition, residents noted improvements in air transportation (mostly an indirect effect of the CIP), the amount of home living space, and the quality of health care and village schools, which were controlled by the local borough school district. Residents also perceived negative changes including less fish and game; higher food and clothing prices; and more drinking, drugs, and fighting. On balance, 35% of Inupiat adults perceived that village living

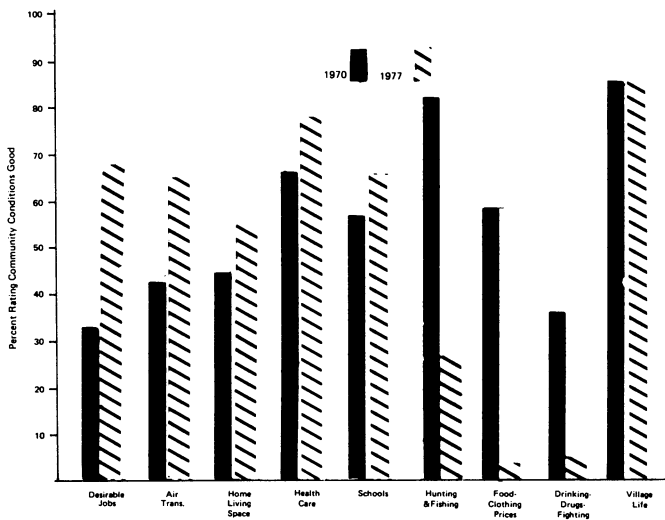


FIGURE 3. SELECTED COMMUNITY PERCEPTIONS OF ALL NORTH SLOPE RESIDENTS: 1970, 1977

conditions worsened since 1970 and only 7% observed that village living conditions had improved.

Most residents (69%) believed that the North Slope Borough has generally met their needs but they were unsure whether the borough had effectively controlled oil development on the North Slope. The oil fields themselves were distant from the villages and the consequences of the development were ambiguous and indirect. When asked to evaluate the overall effects of oil development on the North Slope, one-third of the residents felt that they did not know enough to make an assessment. "Oil didn't come to our villages," one respondent pointed out. "I have not heard enough about it," explained another.

About equal proportions (20%) of residents perceived the overall effects of oil development as good, bad, and mixed. Those seeing the effects as positive stressed that "jobs are provided to the people." Those seeing the effects as negative stressed the decline of fish and game opportunities; for example, "Caribou have to be searched for; hunters go a long distance to find caribou." Whether correctly or not, this group tended to attribute the poorer yields of fish and game to oil development. "One river [where my husband] caught fish has no fish, because of the oil company." The Inupiat also expressed anxiety about the new availability of money and its effects on the traditional culture. "People's way of living has changed because of too much money," said one respondent. "Materially we're better off," pointed out another, "[but] the culture is being lost faster."

If the North Slope Borough had not been formed, perceptions of the effects of oil development probably would have been more clearly negative, for positive assessments were primarily based on increased employment opportunities. As we have seen, most of these new job opportunities were created through the borough, not the oil industry itself. In sum, despite the development of a strong political institution, the creation of jobs, and increased incomes, Inupiat adults were ambivalent about oil development in their region. As in the case of the Cheyenne (Nordstrom et al. 1977) and of Canadian Athabaskan groups (Justus and Simonetta 1979), the Inupiat's ambivalence toward energy development was rooted in the perceived effects

on social problems, fish and game resources, and the maintenance of traditional lifestyles.

Conclusion

As long as Prudhoe Bay tax revenues continue at current levels, the borough's economic strength remains secure, and with it the ability to continue government operations, construction projects, and local, well-paid employment. A stable tax base is expected at least through 1993. Most projections anticipate high Prudhoe Bay tax revenues through the turn of the century. Other oil and gas developments in the North Slope, such as at the National Petroleum Reserve and on the Outer Continental Shelf, may well maintain or increase the borough's tax base.

However, the extensive system of public facilities and social services that has been created on the North Slope requires substantial revenues solely for maintenance and operation. Inupiat residents must pay current users fees, such as utility costs and waste disposal charges, that require them to maintain stable sources of cash income. The Inupiat population has also become accustomed to a high level of cash income and frequent purchases of snowmobiles and other vehicles, vacations, and household goods. Energy development has created a marked dependence on the part of Inupiat individuals and the borough government on an unstable, nonrenewable resource. Oil revenues have not led to the growth of a diversified, self-sustaining regional economy. Indeed, the borough's policy of setting wages at nonmarket rates may impede economic development in other potential sectors (Huskey 1980).

While energy development has had positive economic effects in creating jobs and raising household income, the economic structure created by the borough presents some nagging problems. One issue is the potential disparity of Inupiat men and women in educational achievement and life styles. Inupiat men have entered primarily high paying, blue-collar work (80%), and are maintaining a life style that combines moderate levels of wage work and subsistence activities. Inupiat women, particularly the younger generation, appear to be decreasing participation in subsistence activities and increasing participation in skilled, white-collar work.

In the current North Slope economy, Inupiat women, much more than men, have financial incentives for educational achievement and for occupational mobility. Inupiat women who obtain a high school education or above, for example, earn over one and a half times the weekly wages and over twice the annual wages of women who are not high school graduates. For men, completing high school makes no difference to weekly wages and results in less than a 30% increase in annual wages (an increase which may well disappear if unemployment compensation is taken into account). These different economic incentives may affect male and female levels of educational motivation and other socializing experiences. In the youngest age group, a trend appears for Inupiat women to have slightly higher levels of educational achievement, more employment, and more education, work, and travel experiences outside the North Slope. This disparity indicates a reversal of earlier patterns, where Inupiat men had greater educational, employment, and travel experiences.

Similarly, the white-collar jobs Inupiat women hold provide

more nonformal education than the blue-collar jobs held by men. Inupiat women's jobs tend to place them in close working relationships with professional supervisors who view their role explicitly as training Inupiat employees. Many of these jobs also have built-in training programs and career ladders, such as the education provided health and teacher aides. Inupiat men tend to work for construction contractors who are more concerned with getting the work done than in educating the Inupiat.

A goal of the North Slope Borough is to increase self-sufficiency by raising educational levels and by reducing dependence on imported professionals and other skilled workers. The current economic incentive structure and non-formal job training patterns may not be strongly supporting this objective, at least for the large proportion of men in blue-collar work. There may be an intrinsic conflict in the goals of the North Slope Borough both to distribute high paying jobs to the general population and to encourage educational achievement and skill development.

Another disturbing problem associated with energy development on the North Slope stems from the continued and perhaps increased pressure on subsistence resources. Higher incomes have not eliminated the need to harvest these resources and, in fact, appear to have permitted the Inupiat to increase their hunting effectiveness. Subsistence activities not only continue to produce preferred foods, they are also a social binding force and a source of individual rewards that have not been replaced by new job opportunities. At the same time, however, the potential for excessive resource harvests, whether actual or perceived, has focused state, national, and international interest on the viability of caribou, bowhead, and other animal populations. To date, this interest has been expressed as externally imposed regulations on resource harvests. Should the trend toward external control over subsistence resources continue, the Inupiat may find themselves in the potentially disastrous position of trading subsistence rights for jobs.

While the issues of individual development under the economic incentive structure remains a concern, the North Slope Inupiat have been generally successful in using the opportunities brought about by nearby resource development. The relevance of their experience to other Native American groups affected by energy projects may vary with the particular circumstances. For other Native regions of Alaska that have not organized themselves into borough governments, the North Slope Borough has become an important model. As energy development occurs on Alaska's Outer Continental Shelf or alternative revenue sources become available, other Native regions may well establish borough governments.

The implications of the North Slope Borough experience for Native American communities outside Alaska are less clear. On the North Slope, the taxation mechanism was critical to the Inupiat's ability to obtain substantial economic benefits from oil development. On reservations, development occurs under a different legal structure and there are substantial constraints to tribal taxation, which are only now being overcome. In addition, the Inupiat enjoyed some special circumstances, such as the location of energy projects in enclave developments away from their population centers and major subsistence resources, that may not apply to other situations. The importance of the North Slope experience lies not so much in the particular

strategies and policies used by the Inupiat to direct energy development as in the example it provides of the possibility of using resource development to increase Native American wealth and power and the ability to pursue indigenous goals.

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